AMERICAN VANGUARD CORP
Form 10-K
March 12, 2019

UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-K

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For The Year Ended December 31, 2018

OR

TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For The Transition Period From To

Commission file number 001-13795

AMERICAN VANGUARD CORPORATION

Delaware	95-2588080
(State or other jurisdiction of	(I.R.S. Employer
Incorporation or organization)	Identification Number)
4695 MacArthur Court, Newport Beach, California	92660
(Address of principal executive offices)	(Zip Code)

(949) 260-1200

(Registrant’s telephone number, including area code)

Securities registered pursuant to Section 12(b) of the Act:

Title of each class:	Name of each exchange on which registered:
Common Stock, $.10 par value	New York Stock Exchange

Securities registered pursuant to Section 12(g) of the Act:

NONE

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes No

Indicate by check mark whether the registrant is not required to file reports pursuant to Section 13 or Section 15 (d) of the Act. Yes No

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15 (d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes No

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes No

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K.

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer	Accelerated filer
Non-accelerated filer	Smaller reporting company
	Emerging growth company

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act.

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act). Yes No

The aggregate market value of the voting stock of the registrant held by non-affiliates is $672.9 million. This figure is estimated as of June 30, 2018 at which date the closing price of the registrant's Common Stock on the New York Stock Exchange was $22.95 per share. For purposes of this calculation, shares owned by executive officers, directors, and 5% stockholders known to the registrant have been deemed to be owned by affiliates. The number of shares of $.10 par value Common Stock outstanding as of June 30, 2018, was 30,294,615. The number of shares of $.10 par value Common Stock outstanding as of February 22, 2019 was 29,690,417.

AMERICAN VANGUARD CORPORATION

AND SUBSIDIARIES

ANNUAL REPORT ON FORM 10-K

December 31, 2018

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AMERICAN VANGUARD CORPORATION

AND SUBSIDIARIES

(Dollars in thousands, except per share data)

PART I

Unless otherwise indicated or the context otherwise requires, the terms “Company,” “we,” “us,” and “our” refer to American Vanguard Corporation and its consolidated subsidiaries (“AVD”).

Forward-looking statements in this report, including without limitation, statements relating to the Company’s plans, strategies, objectives, expectations, intentions, and adequacy of resources, are made pursuant to the safe harbor provisions of the Private Securities Litigation Reform Act of 1995. Investors are cautioned that such forward-looking statements involve risks and uncertainties. (Refer to Part I, Item 1A, Risk Factors and Part II, Item 7, Management’s Discussion and Analysis of Financial Condition and Results of Operation, included in this Annual Report.)

ITEM 1 BUSINESS

American Vanguard Corporation (“AVD”) was incorporated under the laws of the State of Delaware in January 1969 and operates as a holding company. Unless the context otherwise requires, references to the “Company” or the “Registrant,” in this Annual Report refer to AVD. The Company conducts its business through its subsidiaries, AMVAC Chemical Corporation (“AMVAC”), GemChem, Inc. (“GemChem”), AMVAC Mexico Sociedad de Responsabilidad Limitada (“AMVAC M”), AMVAC de Costa Rica Sociedad de Responsabilidad Limitada (“AMVAC CR Srl”), AMVAC do Brasil Representácoes Ltda (“AMVAC B”), AMVAC C.V. (“AMVAC CV”), AMVAC Netherlands BV (“AMVAC BV”), Envance Technologies, LLC (“Envance”), TyraTech Inc. (“TyraTech”), AMVAC Singapore Pte, Ltd (“AMVAC Sgpr”), Huifeng AMVAC Innovation Co. Limited (“Hong Kong JV”), OHP Inc. (“OHP”) and Grupo AgriCenter (including the parent AgriCenter S.A. and its subsidiaries (“AgriCenter”)).

Based on similar economic and operational characteristics, the Company’s business is aggregated into one reportable segment. Refer to Part II, Item 7 for selective enterprise information.

AVD operates its business through its principle operating subsidiaries including AMVAC for its domestic business and AMVAC BV for its international business.

AMVAC is a California corporation that traces its history from 1945 and is a specialty chemical manufacturer that develops and markets products for agricultural, commercial and consumer uses. It manufactures and formulates chemicals for crops, turf and ornamental plants, and human and animal health protection. These chemicals, which include insecticides, fungicides, herbicides, molluscicides, growth regulators, and soil fumigants, are marketed in liquid, powder, and granular forms. In prior years, AMVAC considered itself a distributor-formulator, but now AMVAC primarily synthesizes, formulates, and distributes its own proprietary products or custom manufactures, formulates or distributes for others. In addition, the Company has carved out a leadership position in closed delivery systems, currently offers certain of its products in SmartBox, Lock ‘n Load and EZ Load systems, and is developing a precision application technology known as SIMPAS (see “Intellectual Property” below) which will permit the delivery of multiple products (from AMVAC and/or other companies) at variable rates in a single pass. AMVAC has historically expanded its business through both the acquisition of established chemistries (which it has revived in the marketplace), the development and commercialization of new formulations or compounds through licensing arrangements and by expanding our distribution network to gain market access.

AMVAC BV is a Netherlands Corporation that was established in 2012 and is based in Houton, near Amsterdam in the Netherlands. AMVAC BV sells product through sales based subsidiaries in various international territories.

Below is a description of the Company's acquisition/licensing activity over the past five years.

On December 28, 2018, the Company's international subsidiary AMVAC BV completed the purchase of certain assets related to the quizalofop product family from E.I. du Pont de Nemours and Company. Quizalofop is an herbicide marketed under the name Assure II for use on canola, soybeans and pulse (among other things) in Canada and the United States. This transaction includes acquisition of registrations, registration data, trademarks, inventory, commercial sales information, and the transfer of existing product supply arrangements.

On December 14, 2018, AMVAC completed the purchase of certain assets related to the trichlorfon product family from Bayer AG and Bayer CropScience AG ("Bayer"). Trichlorfon is an insecticide marketed under the name Dylox in turf, ornamental and other markets. This transaction includes registrations, trademarks and manufacturing know-how. AMVAC will manufacture and supply formulated end use products to Bayer for the latter's distribution.

On November 9, 2018, AMVAC completed the purchase of all of the outstanding shares of TyraTech, Inc. and, in the process, delisted TyraTech from the AIM market of the London Stock Exchange. TyraTech develops non-toxic insecticides and green solutions for pest control. Their patented technology platform leverages synergistic essential oil combinations to target invertebrate pest receptors that are not active in humans and other mammals.

On June 20, 2018, AMVAC completed the purchase of certain intangible assets related to the Bromacil product family and included end use registrations in the United States. The assets were purchased from Bayer AG. From June 20, 2018 until October 25, 2018, Bayer continued to act as the Company's agent in the market place. Bromacil is a broad spectrum residual herbicide used for non-agricultural industrial vegetation control and on many crops such as pineapples, citrus, agave and asparagus. Marketed under the Hyvar® and Krovar® brands, Bromacil herbicides are valued and long established weed control tools. AMVAC previously purchased these brands from DuPont Crop Protection in 2015 for markets outside of US and Canada including Japan, Thailand, Mexico, Cost Rica and Brazil.

On October 27, 2017, the Company's Netherlands-based subsidiary, AMVAC BV, completed the purchase of AgriCenter S.A., a distribution company based in Costa Rica. AgriCenter markets and distributes end-use chemical and biological products throughout Central America, primarily for crop applications. The acquired assets included product registration, trade names and trademarks, customer lists, personnel, fixed assets, goodwill and working capital.

On October 2, 2017, AMVAC acquired substantially all of the assets of OHP, a US-based distribution company specializing in the greenhouse and nursery production markets. The acquired assets included existing product rights, trade names, customer relationships, personnel, goodwill, fixed assets and working capital.

On August 22, 2017, AMVAC BV, completed the acquisition of certain selective herbicides and contact fungicides including chlorothanonil, ametryn, and isopyrazam, sold in the Mexican agricultural market. The assets were purchased from Syngenta AG and used on various crops such as sugarcane, tomatoes, potatoes and hot peppers. The acquired assets included product registrations, trademarks and trade names, customer lists, and associated inventory.

On June 6, 2017, AMVAC, completed an acquisition of certain herbicides, fungicides and insecticides assets relating to the abamectin, chlorothalonil and paraquat product lines from a group of companies, including Adama Agricultural Solutions, Ltd. These products are used on a wide range of crops such as citrus, cotton, nuts, fruits and vegetables. The acquired assets included product registrations, trademarks and trade names, customer lists, and associated inventory.

On January 13, 2017, AMVAC acquired from The Andersons, Inc. certain assets relating to proprietary formulations containing PCNB, chlorothalonil and propiconazole which are marketed under the name FFII and FFIII. The acquired assets included end use registrations.

On June 27, 2017, both AMVAC BV and Huifeng made individual capital contributions of $950 to the Hong Kong JV. On July 7, 2017, the Hong Kong JV purchased 100% of the shares of Profeng Australia Pty Ltd. ("Profeng"), for a total consideration of $1,900.

On February 29, 2016, AMVAC BV purchased shares constituting a 15% interest in BiPA NV/SA, a Belgian company specializing in the development and early commercialization of biological products for use in agriculture. Through this investment, AMVAC BV obtained possible future access to a pipeline of new biological products for potential commercialization either individually in certain territories or in combination with the Company's existing

product portfolio.

Seasonality

The agricultural chemical industry, in general, is cyclical in nature. The demand for AVD's products tends to be seasonal. Seasonal usage, however, does not necessarily follow calendar dates, but more closely follows varying growing seasonal patterns, weather conditions, geography, weather related pressure from pests and customer marketing programs.

Backlog

AVD does not believe that backlog is a significant factor in its business. The Company primarily sells its products on the basis of purchase orders, although from time to time it has entered into requirements contracts with certain customers.

Customers

The Company's largest three customers accounted for 12%, 9% and 8% of the Company's sales in 2018; 13%, 10% and 10% in 2017; and 15%, 11% and 8% in 2016.

Distribution

AVD manages its US business through its principal operating subsidiary, AMVAC. AMVAC predominantly distributes its products domestically through national distribution companies and buying groups or co-operatives, which purchase AMVAC's goods on a purchase order basis and, in turn, sell them to retailers/growers/end-users. AVD manages its international sales through AMVAC BV, which has sales offices in Mexico, Costa Rica and several other countries in Central America, and sales force executives, sales agents or wholly owned distributors in other territories. The Company's domestic and international distributors, agents and customers typically have long-established relationships with retailers/end-users, far-reaching logistics, transportation capabilities and/or customer service expertise. The markets for AVD products vary by region, target crop, use and type of distribution channel. AVD's customers are experts at addressing these various markets.

Competition

In its many marketplaces, AVD faces competition from both domestic and foreign manufacturers. Many of our competitors are larger and have substantially greater financial and technical resources than AVD. AVD's capacity to compete depends on its ability to develop additional applications for its current products and/or expand its product lines and customer base. AVD competes principally on the basis of the quality and efficacy of its products, price and the technical service and support given to its customers.

Generally, the treatment against pests of any kind is broad in scope, there being more than one way, or one product, for treatment, eradication, or suppression. In some cases, AVD has positioned itself in smaller niche markets, which are no longer addressed by larger companies. In other cases, for example in the Midwest corn market, the Company competes directly with larger competitors.

Manufacturing

Through its four domestic manufacturing facilities (see Item 2, Properties), AVD synthesizes many of the technical grade active ingredients that are in its end-use products. Further, the Company formulates and packages its end use products at its own facilities or at the facilities of third-party formulators.

Raw Materials

AVD utilizes numerous companies to supply the various raw materials and components used in manufacturing its products. Many of these materials are readily available from domestic sources. In those instances where there is a single source of supply or where the source is not domestic, AVD seeks to secure its supply by either long-term (multi-year) arrangements or purchasing on long lead times from its suppliers.

Intellectual Property

AVD's proprietary product formulations are protected, to the extent possible, as trade secrets and, to a lesser extent, by patents. Certain of the Company's closed delivery systems are patented and the Company has made applications for related inventions to expand its equipment portfolio, particularly with respect to its Smart Integrated Multi-Product Precision Application System, ("SIMPAS") technology. Further, AVD's trademarks bring value to its products in both domestic and foreign markets. AVD considers that, in the aggregate, its trademarks, licenses, and patents constitute a valuable asset. While it does not regard its current business as being materially dependent upon any single trademark,

license, or patent, it believes that patents will play an increasingly important role in its developmental equipment technology in future years.

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EPA Registrations

In the United States, AVD's products also receive protection afforded by the terms of the Federal Insecticide, Fungicide and Rodenticide Act ("FIFRA") legislation. The legislation makes it unlawful to sell any pesticide in the United States, unless such pesticide has first been registered by the United States Environmental Protection Agency ("USEPA"). Substantially all of the Company's products, sold in United States, are subject to USEPA registration and periodic re-registration requirements and are registered in accordance with FIFRA. This registration by USEPA is based, among other things, on data demonstrating that the product will not cause unreasonable adverse effects on human health or the environment, when used according to approved label directions. In addition, each state requires a specific registration before any of AVD's products can be marketed, or used in that state. State registrations are predominantly renewed annually with a smaller number of registrations that are renewed on a multiple year basis. Foreign jurisdictions typically have similar registration requirements by statute.

The USEPA, state, and foreign agencies have required, and may require in the future, that certain scientific data requirements be performed on registered products sold by AVD. AVD, on its own behalf and in joint efforts with other registrants, has furnished, and is currently furnishing, required data relative to specific products. Under FIFRA, the federal government requires registrants to submit a wide range of scientific data to support U.S. registrations. This requirement results in operating expenses in such areas as regulatory compliance, with USEPA and other such bodies in the markets in which the Company sells its products. In addition, the Company is required to generate new formulations of existing products or to produce new products in order to remain compliant. The Company expensed $16,047, $14,232 and $11,544, during 2018, 2017 and 2016, respectively, on these activities.

	2018	2017	2016
Registration	$10,749	$9,450	$7,750
Product development	5,298	4,782	3,794
	$16,047	$14,232	$11,544

Environmental

During 2018, AMVAC continued activities to address environmental issues associated with its facility in Commerce, CA. (the "Facility"). An outline of the history of those activities follows.

In 1995, the California Department of Toxic Substances Control ("DTSC") conducted a Resource Conservation and Recovery Act ("RCRA") Facility Assessment ("RFA") of those facilities having hazardous waste storage permits. In March 1997, the RFA culminated in DTSC accepting the Facility into its Expedited Remedial Action Program. Under this program, the Facility was required to conduct an environmental investigation and health risk assessment. This activity then took two paths: first, the RCRA permit closure and second, the larger site characterization.

With respect to the RCRA permit closure, in 1998, AMVAC began the formal process to close its hazardous waste permit at the Facility (which had allowed AMVAC to store hazardous waste longer than 90 days) as required by federal regulations. Formal regulatory closure actions began in 2005 and were completed in 2008, as evidenced by DTSC's October 1, 2008 acknowledgement of AMVAC's Closure Certification Report.

With respect to the larger site characterization, soil and groundwater characterization activities began in December 2002 in accordance with the Site Investigation Plan that was approved by DTSC. Additional activities were conducted from 2003 to 2014, with oversight provided by DTSC. In 2014, the Company submitted a remedial action plan ("RAP") to DTSC, under the provisions of which, the Company proposed not to disturb sub-surface contaminants, but to continue monitoring, maintain the cover above affected soil, enter into restrictive covenants regarding the potential

use of the property in the future, and provide financial assurances relating to the requirements of the RAP. In January 2017, the RAP was circulated for public comment. DTSC responded to those comments and, on September 29, 2017, approved the RAP as submitted by the Company. The Company intends to prepare an operation and maintenance plan, to record covenants on certain affected parcels and to obtain further clarification on financial assurance obligations relating to the RAP. At this stage, the Company does not believe that costs to be incurred in connection with the RAP will be material.

AMVAC is subject to numerous federal and state laws and governmental regulations concerning environmental matters and employee health and safety at its four manufacturing facilities. The Company continually adapts its manufacturing process to the environmental control standards of the various regulatory agencies. The USEPA and other federal and state agencies have the authority to promulgate regulations that could have an impact on the Company’s operations.

AMVAC expends substantial funds to minimize the risk of discharge of materials in the environment and to comply with the governmental regulations relating to protection of the environment. Wherever feasible, AMVAC recovers and recycles raw materials and increases product yield in order to partially offset increasing pollution abatement costs.

The Company is committed to a long-term environmental protection program that reduces emissions of hazardous materials into the environment, as well as to the remediation of identified existing environmental concerns.

Employees

As of December 31, 2018, the Company employed 624 employees. The Company employed 605 employees as of December 31, 2017 and 395 employees as of December 31, 2016. From time to time, due to the seasonality of its business, AVD uses temporary contract personnel to perform certain duties primarily related to packaging of its products. None of the Company's employees are subject to a collective bargaining agreement. The Company believes it maintains positive relations with its employees.

Domestic operations

AMVAC is a California corporation that was incorporated under the name of Durham Chemical in August 1945. The name of the corporation was subsequently changed to AMVAC in January 1971. As the Company's main operating subsidiary, AMVAC owns and/or operates the Company's domestic manufacturing facilities and is also the parent company (owns 99%) of AMVAC CV. AMVAC manufactures, formulates, packages and sells its products in the USA and is a wholly owned subsidiary of AVD.

GemChem is a California corporation that was incorporated in 1991 and was subsequently purchased by the Company in 1994. GemChem sells into the pharmaceutical, cosmetic and nutritional markets, in addition to purchasing key raw materials for the Company. GemChem is a wholly owned subsidiary of AVD.

DAVIE owns real estate for corporate use only. See also Part I, Item 2 of this Annual Report on Form 10-K. DAVIE is a wholly owned subsidiary of AVD.

Envance is a Delaware Limited Liability Company and is a majority owned subsidiary of the Company. It was formed in 2012 with joint venture partner, TyraTech. AMVAC's initial shareholding was 60% and its shareholding increased to 87% in 2015. On November 8, 2018, the Company acquired TyraTech which was previously the minority shareholder in Envance. As of November 9, 2018, the Company owned 100% of Envance. Envance has the rights to develop and commercialize pesticide products and technologies made from natural oils in global consumer, commercial, professional, crop protection and seed treatment markets and has begun bringing products to market.

On October 2, 2017, AMVAC, through a wholly-owned acquisition subsidiary, subsequently renamed OHP, purchased substantially all of the assets of OHP, a domestic distribution company specializing in products for the turf and ornamental market. OHP markets and sells end use products for third parties, either under the third party brand or else as own label products.

As noted above, on November 8, 2018, the Company acquired the remaining 65.62% of the shares of TyraTech Inc. and, as a result, TyraTech became a wholly owned subsidiary of the Company from November 9, 2018.

International operations

In July 2012, the Company formed AMVAC CV, which is incorporated in the Netherlands, for the purpose of managing foreign sales on behalf of the Company. AMVAC CV is owned jointly by AMVAC as the general partner, and AVD International, LLC (also formed in July 2012 as a wholly owned subsidiary of AMVAC), as the limited partner, and is therefore a wholly owned subsidiary of AMVAC.

AMVAC BV is a registered Dutch private limited liability company that was formed in July 2012. AMVAC BV is located in the Netherlands and is wholly owned by AMVAC CV. During 2018, the international business sold the Company's products in 54 countries, as compared to 63 countries in 2017.

AMVAC M is a wholly owned subsidiary of AMVAC BV and was originally formed in 1998 (as Quimica Amvac de Mexico S.A. de C.V and subsequently changed to AMVAC Mexico Sociedad de Responsabilidad Limitada "AMVAC M") to conduct the Company's business in Mexico.

AMVAC Sgpr is a wholly owned subsidiary of AMVAC BV and was formed on April 12, 2016. This new entity was formed to conduct the Company's business in the Asia Pacific and China region.

Hong Kong JV is a 50% owned joint venture with Huifeng (Hong Kong) Limited, a wholly owned subsidiary of Huifeng Agrochemical Company, Ltd, ("Huifeng") a China based basic chemical manufacturer. The Hong Kong JV was formed on August 2, 2016. The purpose of the joint venture is to be a technology transfer platform between the co-owners, including the development of proprietary agrochemical formulations and precision application systems for crop protection. Furthermore, it is intended to be used to develop both partners' business in the region. This included, in 2017, the acquisition of 100% of the shares of Profeng.

On October 27, 2017, AMVAC BV purchased 100% of the stock of AgriCenter, located in Costa Rica, which owned shares in subsidiaries located in Costa Rica, Panama, Nicaragua, Honduras, the Dominican Republic, Mexico, Guatemala, and El Salvador. These affiliated entities, collectively known as AgriCenter, market, sell and distribute end-use chemical and biological products throughout Central America primarily for crop applications.

The Company classifies as international sales all products bearing foreign labeling shipped to a foreign destination.

	2018	2017	2016
International sales	$153,958	$98,905	$83,259
Percentage of net sales	33.9 %	27.9 %	26.7 %

Risk Management

The Company regularly monitors matters, whether insurable or not, that could pose material risk to its operations, the safety of its employees and neighbors, and its financial performance. The Risk Committee of the Board of Directors ("Board") was formed in 2010, consists of three members of the Board and meets regularly. All members of the Board are invited to and typically attend Risk Committee meetings. Working with senior management, the committee continuously evaluates the Company's risk profile, identifies mitigation measures and ensures that the Company is prudently managing these risks. In support of the Risk Committee, senior management has appointed a risk manager and designated several senior executives to lead teams focused on addressing each of the most material risks facing the Company; these groups perform analysis with the benefit of operational knowledge. The top risks identified by management and being addressed by risk teams (in no particular order) include: adverse political and regulatory climate; managing inventory and optimizing manufacturing efficiency; succession planning and bench strength; maintaining a competitive edge in the marketplace; the possibility of an environmental event; undervaluation of the Company; availability of acquisition and licensing targets and cyber-terrorism. In addition, the Company continually evaluates insurance levels for product liability, property damage and other potential areas of risk. Management believes its facilities and equipment are adequately insured against loss from usual business risks including cyber-terrorism.

Available Information

The Company makes available free of charge (through its website, www.american-vanguard.com), its Annual Report on Form 10-K, Quarterly Reports on Form 10-Q, current reports on Form 8-K, and all amendments to those reports as soon as reasonably practicable after such material is electronically filed with the Securities and Exchange Commission

(“SEC”). All reports filed with the SEC are available free of charge on the SEC website, www.sec.gov. Also available free of charge on the Company’s website are the Company’s Audit Committee, Compensation Committee, Finance Committee and Nominating and Corporate Governance Committee Charters, the Company’s Corporate Governance Guidelines, the Company’s Code of Conduct and Ethics, the Company’s Employee Complaint Procedures for Accounting and Auditing Matters and the Company’s policy on Stockholder Nomination and Communication. The Company’s Internet website and the information contained therein or incorporated therein are not intended to be incorporated into this Annual Report on Form 10-K.

ITEM 1A. RISK FACTORS

The regulatory climate remains challenging to the Company's interests both domestically and internationally—Various agencies within the U.S. (both federal and state) and foreign governments continue to exercise increased scrutiny in permitting continued uses (or the expansion of such uses) of may chemistries, including many of the Company's products and, in some cases, have initiated or entertained challenges to these uses. The challenge of the regulatory climate is more pronounced in certain geographical regions (outside the United States) where the Company faces resistance to the continued use of certain of its products. For example, the EU employs a hazard-based analysis when considering whether product registrations can be maintained; under this approach, EU regulatory authorities typically do not weigh benefit against risk in their assessments and routinely cancel products for which a safer alternative is available, notwithstanding the benefit of the cancelled product. There is no guarantee that this regulatory climate will change in the near term or that the Company will be able to maintain or expand the uses of many of its products in the face of such regulatory challenges.

USEPA has proposed further limitations on the continued registration of organophosphates— In September 2015, the USEPA published in the Federal Register a memorandum entitled, "Literature Review on Neurodevelopmental Effects & FQPA Safety Factor Determination for the Organophosphate Pesticides," in which it adopted a position recommending the application of a 10X safety factor under the FQPA (Food Quality Protection Act) in light of the alleged possibility of neurodevelopmental harm to women and children based on epidemiological data. Since that time, in the face of objection from industry, the agency has applied this safety factor to all registered OPs, including those owned by the Company, as they have come up for review or renewal. The Company, like many in our industry, believes that applying this safety factor is not based upon sound science and that the limited studies upon which the agency is relying (for which raw data is not available even to the agency) do not establish a causal link between the perceived harm and the use of its products. Accordingly, the Company intends to take all action necessary to defend its registrations. We have been joined in this effort by other companies that are similarly concerned about the potential impact of USEPA's action. Nevertheless, there is no guarantee that the Company's actions will alter the course that USEPA has proposed and, if the agency's position becomes final, some uses of the company's OP products could be limited or cancelled. Such action could have a material adverse effect upon the Company's financial performance in future reporting periods.

Use of the Company's products is subject to continuing challenges from activist groups—Use of agrochemical products, including the Company's products, is regularly challenged by activist groups in many jurisdictions under a multitude of federal, state and foreign statutes, including FIFRA, the Food Quality Protection Act, Endangered Species Act ("ESA") and the Clean Water Act, to name a few. These challenges typically take the form of lawsuits or administrative proceedings against the USEPA and/or other federal, state or foreign agencies, the filing of amicus briefs in pending actions, the introduction of legislation that is inimical to the Company's interests, and/or adverse comments made in response to public comment invited by regulatory agencies in the course of registration, re-registration or label expansion. The most prominent of these actions include a line of cases under which environmental groups have sought to suspend, cancel or otherwise restrict the use of pesticides that have been approved by USEPA on the ground that that agency failed to confer with the National Marine Fishery Service and/or the Fish and Wildlife Service under the ESA with respect to biological opinions relating to the use of such products. While industry has been active in defending registrations and proposing administrative and legislative approaches to address serious resource issues at the affected agencies, these cases continue to be brought. It is possible that one or more of these challenges could succeed, resulting in a material adverse effect upon one or more of the Company's products.

The distribution and sale of the Company's products are subject to prior governmental approvals and thereafter ongoing governmental regulation—The Company's products are subject to laws administered by federal, state and foreign governments, including regulations requiring registration, approval and labeling of its products. The labeling requirements restrict the use of, and type of, application for our products. More stringent restrictions could make our products less available, which would adversely affect our revenues and profitability. Substantially all of the Company's products are subject to the USEPA (and/or similar agencies in the various territories or jurisdictions in which we do business) registration and re-registration requirements, and are registered in accordance with FIFRA or similar laws.

Such registration requirements are based, among other things, on data demonstrating that the product will not cause unreasonable adverse effects on human health or the environment when used according to approved label directions. All states, where any of the Company's products are used, also require registration before products, such as the Company sells, can be marketed or used in that state. Governmental regulatory authorities have required, and may require in the future, that certain scientific data requirements be performed on the Company's products. The Company, on its behalf and also in joint efforts with other registrants, has and is currently furnishing certain required data relative to its products. There can be no assurance, however, that the USEPA or similar agencies will not request that certain tests or studies be repeated or that more stringent legislation or requirements will not be imposed in the future. The Company can provide no assurance that any testing approvals or registrations will be granted on a timely basis, if at all, or that its resources will be adequate to meet the costs of regulatory compliance.

The manufacturing of the Company’s products is subject to governmental regulations—The Company currently owns and operates three manufacturing facilities which are located in Los Angeles, California; Axis, Alabama; and Marsing, Idaho and owns and has manufacturing services provided in a fourth facility in Hannibal, Missouri (the “Facilities”). The Facilities operate under the laws and regulations imposed by relevant state and local authorities. The manufacturing of key ingredients for certain of the Company’s products occurs at the Facilities. An inability to renew or maintain a license or permit, or a significant increase in the fees for such licenses or permits, could impede the Company’s manufacture of one or more of its products and/or increase the cost of production; this, in turn, would materially and adversely affect the Company’s ability to provide customers with its products in a timely and affordable manner.

The Company may be subject to environmental liabilities—While the Company is fully committed toward minimizing the risk of discharge of materials into the environment and to complying with governmental regulations relating to protection of the environment, its neighbors and its workforce. Nevertheless, federal and state authorities may seek fines and penalties for any violation of the various laws and governmental regulations. In addition, while the Company continually adapts its manufacturing processes to the environmental control standards of regulatory authorities, it cannot entirely eliminate the risk of accidental contamination or injury from hazardous or regulated materials. Further, these various governmental agencies could, among other things, impose potential civil and criminal liability arising under RCRA for the Company’s importation (transportation, handling, and storage) of depleted Thimet containers (see, “Legal Proceedings” below). In short, the Company may be held liable for significant damages or fines relating to any environmental contamination, injury, or compliance violation which could have a material adverse effect on the Company’s consolidated financial condition, statements of operations and cash flows.

Tariff Activity—Over the course of the past several months, the U.S. and China have imposed a series of retaliatory tariffs against one another in respect of various products, ranging from metals to grains to chemicals. To date, the Company has not been materially adversely affected by these tariffs. However, it is not always possible to predict which products could be targeted by either nation, nor is it possible to predict the size or duration of any given tariff. It is possible that either the U.S. or China could place tariffs on one or more products that would cause either a disruption in the markets of the Company’s customers or an increase in the Company’s cost of goods which, either individually or in the aggregate, could have a material adverse effect upon the Company’s operations or financial performance.

The Company is dependent upon sole source suppliers for certain of its raw materials and active ingredients—There are a limited number of suppliers of certain important raw materials used by the Company in a number of its products. Certain of these raw materials are available solely from single sources either domestically or overseas. Starting January 1, 2017, the Chinese government began placing significant restrictions on chemical manufacturing in the People's Republic of China. This, in turn, has led to closure of multiple manufacturing plants and scarcity of supply for certain products that are imported by the Company. In conjunction with the purchase and/or licensing of certain product lines, the Company has entered into multi-year supply arrangements under which such counterparties are the sole source of either active ingredients and/or formulated end-use product, and in some cases, the manufacturer has entered the market as a competitor. The Company is actively pursuing new supply agreements to mitigate the risk of product supply from the People’s Republic of China, by either approving new suppliers outside of China, or conversely by pursuing new Chinese suppliers who have a stronger in situ backward integration position. There is no guarantee that any of our suppliers will be willing or able to supply these products to the Company reliably, continuously and at the levels anticipated by the Company or required by the market. If these sources prove to be unreliable and the Company is not able to supplant or otherwise second source these suppliers, it is possible that the Company will not realize its projected sales which, in turn, could adversely affect the Company's consolidated financial statements.

Newly acquired businesses or product lines may not generate forecasted results—While the Company conducts due diligence on acquisitions and employs rigorous investment criteria before making acquisitions, there is no guarantee that a business or product line acquired by the Company will generate results that meet or exceed results that were forecasted by the Company in evaluating the acquisition. There are many factors that could affect the performance of

a newly acquired business or product line. While the Company uses conservative assumptions in valuing a business or product line prior to concluding an acquisition, actual results generated post-closing could vary widely from the Company’s forecast and, as such, could have a material effect upon the Company’s overall financial performance.

The Company’s investment in foreign businesses may pose additional risks—With the expansion of its footprint internationally and, in particular, with the business acquired in Central America in 2017 and Brazil in 2018, the Company now carries on business at a material level in some jurisdictions that have a history of political or economic instability. While such instability may not be present at the current time, there is no guarantee that conditions will not change in one or more jurisdictions quickly and without notice, nor is there any guarantee that the Company would be able to recoup its investment in such territories in light of such changes. Adverse changes of this nature could have a material effect upon the Company’s overall financial performance.

The Company’s investment in technology may not generate forecasted returns—The Company has had a history of investing in technological innovation primarily focused on product delivery systems as one of its core strategies. We have focused on technology in closed delivery systems, fumigant application and precision application, to name a few. These investments are based upon the premise that new technology will allow for safer handling of the Company’s products, appeal to regulatory agencies and the market we serve, gain commercial acceptance and command a return that is sufficiently in excess of the investment. However, there is no guarantee that a new technology will be successfully commercialized, generate a material return or maintain market appeal for a substantial period of time. Further, many types of development costs must be expensed in the period in which they are incurred. This, in turn, tends to put downward pressure on period profitability. There can be no assurance that these expenses will be recovered through successful commercialization of a new technology.

The Company’s business may be adversely affected by cyclical and seasonal effects—Demand for the Company’s products tends to be seasonal. Seasonal usage follows varying agricultural seasonal patterns, weather conditions and weather related pressure from pests. Weather patterns can have an impact on the Company’s operations. For example, the end user of its products may, because of weather patterns, delay or intermittently disrupt field work during the planting season, which may result in a reduction of the use of some products and therefore may, at some point, reduce the Company’s revenues and profitability. In light of the possibility of adverse seasonal effects, there can be no assurance that the Company will maintain sales performance at historical levels in any particular region.

To the extent that capacity utilization is not fully realized at its manufacturing facilities, the Company may experience lower profitability—While the Company endeavors continuously to maximize utilization of it manufacturing facilities, our success in these endeavors is dependent upon many factors, including fluctuating market conditions, product life cycles, weather conditions, availability of raw materials, equipment failures, and regulatory constraints, among other things. There can be no assurance that the Company will be able to maximize the utilization of capacity at its manufacturing facilities.

The Company’s continued success depends, in part, upon a limited number of key employees—Within certain functions, the Company relies heavily on a small number of key employees to manage ongoing operations and to perform strategic planning. In some cases, there are no internal candidates who are qualified to succeed these key personnel in the short term. In the event that the Company were to lose one or more key employees, there is no guarantee that Company could replace them with people having comparable skills. Further, the loss of key personnel could adversely affect the operation of our business.

The Company faces competition in certain markets from new technologies and demand for organically produced food—The Company faces competition from larger companies that market new chemistries, genetically modified (“GMO”) seeds and other similar technologies (e.g., RNA interference) in certain of the crop protection sectors in which the Company competes, particularly that of corn. In fact, many growers that have chosen to use GMO seeds have reduced their use of the types of pesticides sold by the Company. There is no guarantee that the Company will maintain its market share or pricing levels in sectors that are subject to competition from companies that market new technologies. Further, it is possible that increased demand for organic crops may, over time, reduce the demand for the Company’s products.

The Company faces competition from generic competitors that source product from countries having lower cost structures—The Company continues to face competition from competitors around the globe that may enter the market through either offers to pay data compensation, or similar means in foreign jurisdictions, and then subsequently source material from countries having lower cost structures (typically India and China). These competitors typically tend to operate at thinner gross margins and, with low costs of goods, tend to drive pricing and profitability of subject product lines downward. There is no guarantee that the Company will maintain market share and pricing when facing such generic competitors, or that such competitors will not offer generic versions of the Company's products in the future.

The Company’s key customers typically carry competing product lines and may be influenced by the Company’s larger competitors—A significant portion of the Company’s products are sold to national distributors in the United States, which also carry product lines of competitors that are much larger than the Company. Typically, revenues from the sales of these competing product lines and related program incentives constitute a greater part of our distributors’ income than do revenues from sales and program incentives arising from the Company’s product lines. With the recent consolidation among domestic distribution companies, these considerations have become more pronounced. In light of these facts, there is no assurance that such customers will continue to market our products aggressively or successfully or that the Company will be able to influence such customers to continue to purchase our products instead of those of our competitors.

Industry consolidation may threaten the Company’s position in various markets—The global agricultural chemical industry continues to undergo significant consolidation. Many of the Company’s competitors have grown or are expected to grow through mergers and acquisitions. As a result, these competitors will tend to be in position to realize greater economies of scale, offer more diverse portfolios and thereby exert greater influence throughout the distribution channels. Consequently, the Company may find it more difficult to compete in various markets. While such merger activity may generate acquisition opportunities for the Company, there is no guarantee that the Company will benefit from such opportunities. Further, there is a risk that the Company’s future performance may be hindered by the growth of its competitors through consolidation.

The Company is dependent on a limited number of customers, which makes it vulnerable to the continued relationship with and financial health of those customers—In 2018, 2017 and 2016, three customers accounted for 29%, 33% and 34%, respectively, of the Company’s sales. The Company’s future prospects may depend on the continued business of such customers and on our continued status as a qualified supplier to such customers. The Company cannot guarantee that these key customers will continue to buy products from us at current levels. The loss of a key customer could have a material adverse effect on the Company’s consolidated financial statements.

The carrying value of certain assets on the Company’s consolidated balance sheets may be subject to impairment depending upon market trends and other factors—The Company regularly reviews the carrying value of certain assets, including long-lived assets, inventory, fixed assets and intangibles. Depending upon the class of assets in question, the Company takes into account various factors including, among others, sales, trends, market conditions, cash flows, profit margins and the like. Based upon this analysis, where circumstances warrant the Company may leave such carrying values unchanged or adjust them as appropriate. There is no guarantee that these carrying values can be maintained indefinitely, and it is possible that one or more such assets could be subject to impairment which, in turn, could have an adverse impact upon the Company’s consolidated financial statements.

The Company’s computing systems are subject to cyber security risks – In the course of its operations the Company relies on its computing systems, including access to the internet, the use of third party applications and the storage and transmission of data through such systems. While the Company has implemented security measures to protect these systems, there is no guarantee that a third party will not penetrate these defenses and either compromise, corrupt or shut down these systems. Further, in the event of such incursion it is possible that confidential business information and private personal data could be taken. Such an event could adversely affect both the Company’s ability to operate, its reputation with key stakeholders and its overall financial performance

Reduced financial performance may limit the Company’s ability to borrow under its credit facility—The Company has historically grown net sales and net income through both expansion of current product lines, the acquisition of product lines from third parties and the acquisition of both domestic and international distributors with strong niche market positions. In order to finance such acquisitions, the Company has drawn upon its senior credit facility. However, the Company’s borrowing capacity under the senior credit facility depends, in part, upon its satisfaction of a negative covenant that sets a maximum ratio of borrowed debt to earnings (as measured over the trailing 12-month period). There is no guarantee that the Company will continue to generate earnings necessary to ensure that it has sufficient borrowing capacity to support future acquisitions or that, when necessary, the lender group will amend the

senior credit facility to provide for such borrowing capacity. Further, despite the Company’s long-standing relationship with its lenders, in light of the uncertainties in global financial markets there is no guarantee that the Company’s lenders will be either willing or able to continue lending to the Company at such rates and in such amounts as may be necessary to meet the Company’s working capital needs.

The Company’s growth has been fueled in part by acquisitions—Over the past few decades, the Company’s growth has been driven by acquisitions and licensing of both established and developmental products from third parties. There is no guarantee that acquisition targets or licensing opportunities meeting the Company’s investment criteria will remain available or will be affordable. If such opportunities do not present themselves, then the Company may be unable to record consistent growth in future years.

The Company is subject to taxation related risks in multiple jurisdictions—The Company is a U.S. based multinational company subject to tax in multiple U.S. and foreign tax jurisdictions. Significant judgment is required in determining our global provision for income taxes, deferred tax assets or liabilities and in evaluating our tax positions on a worldwide basis. While we believe our tax positions are consistent with the tax laws in the jurisdictions in which we conduct our business, it is possible that these positions may be contested or overturned by jurisdictional tax authorities, which may have a significant impact on our global provision for income taxes. Tax laws are dynamic and subject to change as new laws are passed and new interpretations of the law are issued or applied. The U.S. recently enacted significant tax reform, and certain provisions of the new law may adversely affect us. In addition, governmental tax authorities are increasingly scrutinizing the tax positions of companies. Many countries in the European Union, as well as a number of other countries and organizations such as the Organization for Economic Cooperation and Development, are actively considering changes to existing tax laws that, if enacted, could increase our tax obligations in countries where we do business. If U.S. or other foreign tax authorities change applicable tax laws, our overall taxes could increase, and our business, financial condition or results of operations may be adversely impacted.

The Company is subject to adverse impact from the United Kingdom's decision to end its membership in the European Union—In June 2016, a majority of voters in the United Kingdom elected to withdraw from the European Union ("EU") in a national referendum ("BREXIT"). The results of the United Kingdom's BREXIT has caused, and may continue to cause, volatility in global stock markets, currency exchange rate fluctuations and global economic uncertainty. Although it is unknown what the terms of the United Kingdom's future relationship with the EU will be, it is possible that there will be higher tariffs or greater restrictions on imports and exports between the United Kingdom and the EU and increased regulatory complexities. The effects of BREXIT could potentially impact the Company's operations primarily in mainland Europe, including financial, legal, tax, and trade.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None

ITEM 2 PROPERTIES

AMVAC owns in fee the Facility constituting approximately 152,000 square feet of improved land in Commerce, California ("Commerce") on which its West Coast manufacturing, some of its warehouse facilities and some of its manufacturing administrative offices are located.

DAVIE owns in fee approximately 72,000 square feet of warehouse, office and laboratory space on approximately 118,000 square feet of land in Commerce, California, which is leased to AMVAC. In 2013, the Company made a significant investment in the Glenn A. Wintemute Research Center, which houses the Company's primary research laboratory supporting synthesis, formulation and other new product endeavors.

On December 28, 2007, AMVAC purchased certain manufacturing assets relating to the production of Thimet and Counter and located at BASF's multi-plant facility situated in Hannibal, Missouri (the "Hannibal Site"). Subject to the terms and conditions of the Agreement, AMVAC purchased certain buildings, manufacturing equipment, office equipment, fixtures, supplies, records, raw materials, intermediates and packaging constituting the "T/C Unit" of the Hannibal Site. The parties entered into a ground lease and a manufacturing and shared services agreement, under which BASF continues to supply various shared services to AMVAC for the Hannibal Site.

On March 7, 2008, AMVAC acquired from Bayer CropScience Limited Partnership, ("BCS LP"), a U.S. business of Bayer CropScience GmbH, a facility (the "Marsing Facility") located in Marsing, ID, which consists of approximately 17 acres of improved real property. The Marsing Facility is engaged in the blending of liquid and powder raw materials and the packaging of some of the Company's finished goods inventory in liquid, powder and pelletized formulations which are sold both in the US and internationally.

In 2001, AMVAC completed the acquisition of a manufacturing facility (the "Axis Facility") from E.I. DuPont de Nemours and Company ("DuPont"). The Axis Facility is one of three such units located on DuPont's 510 acre complex in Axis, Alabama. The acquisition consisted of a long-term ground lease of 25 acres and the purchase of all improvements thereon. The facility is a multi-purpose plant designed for synthesis of active ingredients and formulation and packaging of finished products. In 2018, FMC Corporation acquired from DuPont a business unit which held, among other things, the Axis Facility. At present, AMVAC is negotiating new terms and conditions for the lease.

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AVD regularly adds chemical processing equipment to enhance or expand its production capabilities. The Company believes its facilities are in good operating condition, are suitable and adequate for current needs, have flexibility to change products, and can produce at greater rates as required. Facilities and equipment are insured against losses from fire as well as other usual business risks. The Company knows of no material defects in title to, or encumbrances on, any of its properties except that substantially all of the Company's assets are pledged as collateral under the Company's credit facility agreements with its primary lender group. For further information, refer to note 2 of the Notes to the Consolidated Financial Statements in Part IV, Item 15 of this Annual Report on Form 10-K.

AVD owns approximately 42 acres of unimproved land in Texas for possible future expansion.

The Company leases approximately 19,953 square feet of office space located at 4695 MacArthur Court in Newport Beach, California. In September 2015 the lease was amended and was extended to expire on June 30, 2021. The premises have served as the Company's corporate headquarters since 1994.

AMVAC BV's, GemChem's, AMVAC M's, AMVAC CR Srl's, AMVAC Sgpr's, OHP's and AgriCenter's facilities consist of administration and/or sales offices which are leased.

ITEM 3 LEGAL PROCEEDINGS

A. DBCP Cases

Over the course of the past 30 years, AMVAC and/or the Company have been named or otherwise implicated in a number of lawsuits concerning injuries allegedly arising from either contamination of water supplies or personal exposure to 1, 2-dibromo-3-chloropropane ("DBCP®"). DBCP was manufactured by several chemical companies, including Dow Chemical Company, Shell Oil Company and AVD and was approved by the USEPA to control nematodes. DBCP was also applied on banana farms in Latin America. The USEPA suspended registrations of DBCP in October 1979, except for use on pineapples in Hawaii. That suspension was partially based on 1977 studies by other manufacturers that indicated a possible link between male fertility and exposure to DBCP among their factory production workers involved with producing it.

At present, there are three domestic lawsuits and approximately 85 Nicaraguan lawsuits filed by former banana workers in which AMVAC has been named as a party. Only two of the Nicaraguan actions have actually been served on AMVAC. With respect to Nicaraguan matters, there was no change in status during 2018. As described more fully below, activity in domestic cases during 2018 is as follows. The one case remaining in Delaware includes 57 plaintiffs who have appealed a lower court finding that the matter was barred by the statute of limitations; this matter has been remanded to the trial court, following a ruling by the Delaware Supreme Court on recognizing the doctrine of cross-jurisdictional tolling. In Hawaii, in the matter of Patrickson, et. al. v. Dole Food Company, the parties have stipulated that the Company shall be dismissed, insofar as it was not a party to the class action case that tolled the statute of limitations. In Adams (also in Hawai'i), there has been no activity since 2014, when the court granted dismissal of co-defendant Dole on the basis of a worker's compensation bar and gave plaintiffs leave to amend their complaint in light of that ruling. Finally, plaintiffs in Chaverri, which had been dismissed by the Superior Court of the State of Delaware in 2012 for failure to meet the applicable statute of limitations, have brought a motion to vacate the dismissal on the ground that the matter should be subject to trial on the merits under the principle of cross-jurisdictional tolling.

Nicaraguan Matters

A review of court filings in Chinandega, Nicaragua, has found 85 suits alleging personal injury allegedly due to exposure to DBCP and involving approximately 3,592 plaintiffs have been filed against AMVAC and other parties. Of these cases, only two – Flavio Apolinar Castillo et al. v. AMVAC et al., No. 535/04 and Luis Cristobal Martinez Suazo et al. v. AMVAC et al., No. 679/04 (which were filed in 2004 and involve 15 banana workers) – have been served on AMVAC. All but one of the suits in Nicaragua have been filed pursuant to Special Law 364, an October

2000 Nicaraguan statute that contains substantive and procedural provisions that Nicaragua's Attorney General previously expressed as unconstitutional. Each of the Nicaraguan plaintiffs' claims $1,000 in compensatory damages and $5,000 in punitive damages. In all of these cases, AMVAC is a joint defendant with Dow Chemical Company and Dole Food Company, Inc. AMVAC contends that the Nicaragua courts do not have jurisdiction over it and that Public Law 364 violates international due process of law. AMVAC has objected to personal jurisdiction and demanded under Law 364 that the claims be litigated in the United States. In 2007, the court denied these objections, and AMVAC appealed the denial. It is not presently known as to how many of these plaintiffs actually claim exposure to DBCP at the time AMVAC's product was allegedly used nor is there any verification of the claimed injuries. Further, to date, plaintiffs have not had success in enforcing Nicaraguan judgments against domestic companies before U.S. courts. With respect to these Nicaraguan matters, AMVAC intends to defend any claim vigorously. Furthermore, the Company does not believe that a loss is either probable or reasonably estimable and has not recorded a loss contingency for these matters.

Delaware DBCP Cases

Abad Castillo and Marquinez. On or about May 31, 2012, two cases (captioned Abad Castillo and Marquinez) were filed with the United States District Court for the District of Delaware (USDC DE No. 1:12-CV-00695-LPS) involving claims for physical injury arising from alleged exposure to DBCP over the course of the late 1960's through the mid-1980's on behalf of 2,700 banana plantation workers from Costa Rica, Ecuador, Guatemala, and Panama. Defendant Dole brought a motion to dismiss 22 plaintiffs from Abad Castillo on the ground that they were parties in cases that had been filed by HendlerLaw, P.C. in Louisiana. On September 19, 2013, the appeals court granted, in part, and denied, in part, the motion to dismiss, holding that 14 of the 22 plaintiffs should be dismissed. On May 27, 2014, the district court granted Dole's motion to dismiss the matter without prejudice on the ground that the applicable statute of limitations had expired in 1995. Then, on August 5, 2014, the parties stipulated to summary judgment in favor of defendants (on the same ground as the earlier motion) and the court entered judgment in the matter. Plaintiffs were given an opportunity to appeal; however, only 57 of the 2,700 actually entered an appeal. Thus, only 57 plaintiffs remain in the action. On or about June 18, 2017, the Third Circuit Court submitted a certified question of law to the Delaware Supreme Court on the question of when the tolling period ended. The Delaware Supreme Court heard oral argument on January 17, 2018 and, on March 15, 2018 ruled on the matter, finding that federal court dismissal in 1995 on the grounds of forum non conveniens did not end class action tolling, and that such tolling ended when class action certification was denied in Texas state court in June 2010. This matter is now at the district court, following the appeals court's receipt of the ruling. Discovery has commenced. The Company believes that a loss is neither probable nor reasonably estimable in this matter and has not recorded a loss contingency.

Chaverri. This matter involves 258 plantation workers from Costa Rica, Ecuador and Panama alleging physical injury from DBCP in the late 1970's, was originally filed in the state of Texas in 1993, then underwent a tortuous series of law and motion developments until it was ultimately refiled in May 2012 by the Hendler firm in the Superior Court of the State of Delaware as Chaverri et al. v. Dole Food Company, Inc. et al. (including AMVAC) (N12C-06-017 ALR), where it was subsequently dismissed with prejudice in August 2012 under the statute of limitations. In light of the Delaware Supreme Court's adoption of cross-jurisdictional tolling, however, in January 2019, plaintiffs filed a motion to vacate the dismissal, arguing that the matter had been dismissed on a basis which the Delaware Supreme Court no longer recognizes without ever having been adjudicated as to the merits. Defendants are filing briefs in opposition to this motion. The Company believes that a loss is neither probable nor reasonably estimable and has not recorded a loss contingency.

Hawaiian DBCP Matters

Patrickson, et. al. v. Dole Food Company, et al. In October 1997, AMVAC was served with two complaints in which it was named as a defendant, filed in the Circuit Court, First Circuit, State of Hawai'i and in the Circuit Court of the Second Circuit, State of Hawai'i (two identical suits) entitled Patrickson, et. al. v. Dole Food Company, et. al ("Patrickson Case") alleging damages sustained from injuries (including sterility) to banana workers caused by plaintiffs' exposure to DBCP while applying the product in their native countries. Other named defendants include: Dole Food Company, Shell Oil Company and Dow Chemical Company. After several years of law and motion activity, the court granted judgment in favor of the defendants based upon the statute of limitations on July 28, 2010. On August 24, 2010, the plaintiffs filed a notice of appeal. On April 8, 2011, counsel for plaintiffs filed a pleading to withdraw and to substitute new counsel. On October 21, 2015, the Hawai'i Supreme Court granted the appeal and overturned the lower court decision, ruling that the State of Hawai'i now recognizes cross-jurisdictional tolling (that is, the principle under which the courts of one state recognize another state's common law on the tolling of statutes of limitation), that plaintiffs filed their complaint within the applicable statute of limitations and that the matter is to be remanded to the lower court for further adjudication. However, in November 2018, the parties stipulated that, because it was not named as a defendant in the Carcamo matter (class action matter that gave rise to the tolling of the statute of limitations), AMVAC should be dismissed from this matter. Thus, we expect that the Company will be dismissed with prejudice from this action as soon as the court issues an order.

Adams v. Dole Food Company et al. On approximately November 23, 2007, AMVAC was served with a suit filed by two former Hawaiian pineapple workers (and their spouses), alleging that they had testicular cancer due to DBCP exposure; the action is captioned Adams v. Dole Food Company et al in the First Circuit for the State of Hawaii. Plaintiff alleges that they were exposed to DBCP between 1971 and 1975. AMVAC denies that any of its product could have been used at the times and locations alleged by these plaintiffs. Following the dismissal of Dole Food Company on the basis of the exclusive remedy of worker’s compensation benefits, plaintiffs appealed the dismissal. The court of appeals subsequently remanded the matter to the lower court in February 2014, effectively permitting plaintiffs to amend their complaint to circumvent the workers’ compensation bar. There has been no activity in the case since that time, and the Company does not believe that a loss is either probable or reasonably estimable and has not recorded a loss contingency for this matter.

B. Other Matters

EPA FIFRA/RCRA Matter. On November 10, 2016, the Company was served with a grand jury subpoena out of the U.S. District Court for the Southern District of Alabama in which the U.S. Department of Justice ("DoJ") sought production of documents relating to the Company's reimportation of depleted Thimet containers from Canada and Australia. The Company retained defense counsel and completed production of documents. During the fourth quarter of 2018, government attorneys interviewed four individuals who may be knowledgeable of the matter. At this stage, DoJ has not made clear its intentions with regard to either its theory of the case or potential criminal enforcement. Thus, it is too early to tell whether a loss is probable or reasonably estimable. Accordingly, the Company has not recorded a loss contingency on this matter.

Harold Reed v. AMVAC et al. During January 2017, the Company was served with two Statements of Claim that had been filed on March 29, 2016 with the Court of Queen's Bench of Alberta, Canada (as case numbers 160600211 and 160600237) in which plaintiffs Harold Reed (an applicator) and 819596 Alberta Ltd. dba Jem Holdings (an application equipment rental company) allege physical injury and damage to equipment, respectively, arising from a fire that occurred during an application of the Company's potato sprout inhibitor, SmartBlock, at a potato storage facility in Coaldale, Alberta on April 2, 2014. Plaintiffs allege, among other things, that AMVAC was negligent and failed to warn them of the risks of such application. Reed seeks damages of $250 for pain and suffering, while Jem Holdings seeks $60 in lost equipment; both plaintiffs also seek unspecified damages as well. Also during January 2017, the Company received notice that four related actions relating to the same incident were filed with the same court: (i) Van Giessen Growers, Inc. v Harold Reed et al (No. 160303906)(in which grower seeks $400 for loss of potatoes); (ii) James Houweling et al. v. Harold Reed et al. (No. 160104421)(in which equipment owner seeks damages for lost equipment); (iii) Chin Coulee Farms, etc. v. Harold Reed et al. (No. 150600545)(in which owner of potatoes and truck seeks $530 for loss thereof); and (iv) Houweling Farms v. Harold Reed et al. (No. 15060881)(in which owner of several Quonset huts seeks damages for lost improvements, equipment and business income equal to $4,300). The Company was subsequently named as cross-defendant in those actions by Reed. During the third quarter of 2017, counsel for the Company filed a Statement of Defence (the Canadian equivalent of an answer), alleging that Reed was negligent in his application of the product and that the other cross-defendants were negligent for using highly flammable insulation and failing to maintain sparking electrical fixtures in the storage units affected by the fire. The Company believes that the claims against it in these matters are without merit and intends to defend them vigorously. At this stage in the proceedings, however, it is too early to determine whether a loss is probable or reasonably estimable; accordingly, the Company has not recorded a loss contingency.

Takings Case. On June 14, 2016, the Company filed a lawsuit against the USEPA in the U.S. Court of Federal Claims, entitled "American Vanguard Corporation v. USEPA" (Case No. 16-694C) under which the Company claimed damages from USEPA on the ground that that agency's issuance of a Stop Sale, Use and Removal Order against the PCNB product line in August 2010 amounts to a taking without just compensation under the Tucker Act. The court in this matter denied the government's motion to dismiss for lack of jurisdiction and failure to state a claim, which was brought in September 2016. Fact and expert discovery was completed, and both parties filed motions for summary judgment on the merits. In January 2019, the court denied the Company's motion for summary judgment, while granting that of the government, finding that the Company's PCNB business did not amount to a cognizable property interest in the context of the Tucker Act. The Company will be filing a motion for reconsideration on the ground that the court's decision was based upon an erroneous understanding of the facts. Since any recovery in this matter is contingent upon judgment, and there is no assurance of receiving a favorable judgment, the Company has not recorded any amount in its consolidated financial statements.

ITEM 4 MINE SAFETY DISCLOSURES

Not Applicable

PART II

ITEM 5 MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

Market Information

Effective March 7, 2006, the Company listed its $0.10 par value common stock ("Common Stock") on the New York Stock Exchange under the ticker symbol AVD. From January 1998 through March 6, 2006, the Common Stock was listed on the American Stock Exchange under the ticker symbol AVD. The Company's Common Stock traded on The NASDAQ Stock Market under the symbol AMGD from March 1987 through January 1998.

Holders

As of February 15, 2019, the number of stockholders of the Company's Common Stock was approximately 4,522, which includes beneficial owners with shares held in brokerage accounts under street name and nominees.

Dividends

The Company has issued a cash dividend in each of the last twenty-three years dating back to 1996. Cash dividends declared during the past three years are summarized in the table below.

Declaration Date	Distribution Date	Record Date	Dividend Per Share	Total Paid
December 10, 2018	January 10, 2019	December 27, 2018	$ 0.020	$581
September 18, 2018	October 17, 2018	October 3, 2018	0.020	588
June 11, 2018	July 12, 2018	June 28, 2018	0.020	587
March 8, 2018	April 13, 2018	March 30, 2018	0.020	586
Total 2018			$ 0.080	$2,342
December 12, 2017	January 10, 2018	December 27, 2017	$ 0.015	$438
September 18, 2017	October 19, 2017	October 5, 2017	0.015	439
June 15, 2017	July 14, 2017	June 30, 2017	0.015	437
March 16, 2017	April 15, 2017	March 31,2017	0.015	435
Total 2017			$ 0.060	$1,749
December 8, 2016	January 6, 2017	December 23, 2016	$ 0.010	$289
October 11, 2016	November 11, 2016	October 28, 2016	0.010	289
June 13, 2016	July 12, 2016	June 30, 2016	0.010	289
Total 2016			$ 0.030	$867

Share Repurchase Program

On November 5, 2018, pursuant to a Board of Directors resolution, the Company announced its intention to repurchase an aggregate amount of shares with a total purchase price not to exceed $20,000 of its common stock, par value $0.10 per share, in the open market, depending upon market conditions over the short to mid-term. The Shares Repurchase Program expires on March 8, 2019. Share repurchases may be executed through various means, including, without limitation, open market transactions, privately negotiated transactions or pursuant to any trading plan that may be adopted in accordance with Rule 10b5-1 of the Securities and Exchange Act of 1934, as amended, subject to market conditions, applicable legal requirements and other relevant factors. The Shares Repurchase Program does not obligate the Company to acquire any particular amount of shares of common stock and the program may be suspended or discontinued at any time.

Purchases of Equity Securities by the Issuer

The table below summarizes the number of shares of our common stock that were repurchased during the three months ended December 31, 2018 under the share repurchase program. The shares and respective amount are recorded as treasury shares on the Company's consolidated balance sheet.

Month ended	Total number of shares purchased	Average price paid per share	Total amount paid	Maximum dollar value of shares that may yet be purchased under the program
November 30, 2018	196,858	$ 17.10	$ 3,366	
December 31, 2018	255,500	15.35	3,921	
	452,358	$ 16.11	$ 7,287	$ 12,713

Securities Authorized for Issuance under Equity Compensation Plans

Plan Category	Number of securities to be issued upon exercise of outstanding options, warrants, and rights	Weighted-average exercise price of outstanding options, warrants, rights	Number of securities remaining available for future issuance under equity compensation plans
Equity compensation plans approved by security holders	524,475	$ 9.74	1,568,888
Total	524,475	$ 9.74	1,568,888

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Stock Performance Graph

The following graph presents a comparison of the cumulative, five-year total return for the Company, the S&P 500 Stock Index, and a peer group (Specialty Chemical Industry). The graph assumes that the beginning values of the investments in the Company, the S&P 500 Stock Index, and the peer group of companies each was $100 on December 31, 2013. All calculations assume reinvestment of dividends. Returns over the indicated period should not be considered indicative of future returns.

ITEM 6 SELECTED FINANCIAL DATA

The selected consolidated financial data set forth below with respect to each of the calendar years in the five-year period ended December 31, 2018, have been derived from the Company's consolidated financial statements and are qualified in their entirety by reference to the more detailed consolidated financial statements and the independent registered public accounting firm's reports thereon, which are included elsewhere in this Report on Form 10-K as of December 31, 2018 and 2017 and for each of the three years in the period ended December 31, 2018. See Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations."

	2018	2017	2016	2015	2014
Net sales (1)	$454,272	$355,047	$312,113	$289,382	$298,634
Gross profit	$182,631	$147,392	$128,288	$111,902	$114,496
Operating income	$39,021	$26,794	$20,540	$11,524	$6,710
Income before provision for income taxes and loss on equity investments	$33,596	$24,853	$18,917	$8,962	$3,644
Net income attributable to American Vanguard	$24,195	$20,274	$12,788	$6,591	$4,841
Earnings per common share	$0.83	$0.70	$0.44	$0.23	$0.17
Earnings per common share—assuming dilution	$0.81	$0.68	$0.44	$0.23	$0.17
Total assets (2)	$593,587	$535,592	$429,956	$435,270	$463,590
Working capital (2)	$164,660	$128,681	$130,001	$139,850	$197,073
Long-term debt, excluding current installments	$96,671	$77,486	$40,951	$68,321	$98,605
Stockholders' equity	$329,230	$305,314	$282,357	$268,326	$261,003
Weighted average shares outstanding—basic	29,326	29,100	28,859	28,673	28,436
Weighted average shares outstanding—assuming dilution	30,048	29,703	29,394	29,237	28,912
Dividends per share of common stock	$0.08	$0.06	$0.03	$0.02	$0.17

(1) The results for reporting periods beginning after January 1, 2018 are presented under ASC 606. Prior period results are not adjusted and continue to be reported in accordance with historic revenue recognition, ASC 605.

(2) The Company's consolidated balance sheets as of December 31, 2015 and 2014, reflect certain reclassifications for deferred income taxes and income taxes payables.

ITEM 7MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

FORWARD-LOOKING STATEMENTS/RISK FACTORS:

The Company, from time-to-time, may discuss forward-looking statements including assumptions concerning the Company's operations, future results and prospects. Generally, "may," "could," "will," "would," "expect," "believe," "estimate "anticipate," "intend," "continue" and similar words identify forward-looking statements. Forward-looking statements appearing in this Report are made pursuant to the safe harbor provisions of the Private Securities Litigation Reform Act of 1995. Forward-looking statements are based on our current expectations and are subject to risks and uncertainties that can cause actual results and events to differ materially from those set forth in or implied by the forward-looking statements and related assumptions contained in the entire Report. Such factors include, but are not limited to: product demand and market acceptance risks; the effect of economic conditions; weather conditions; changes in regulatory policy; the impact of competitive products and pricing; changes in foreign exchange rates; product development and commercialization difficulties; capacity and supply constraints or difficulties; availability of capital resources; general business regulations, including taxes and other risks as detailed from time-to-time in the Company's reports and filings filed with the U.S. SEC. It is not possible to foresee or identify all such factors. We urge you to consider these factors carefully in evaluating the forward-looking statements contained in this Report.

MANAGEMENT OVERVIEW

The Company's operating results in 2018 were generally improved over those of 2017 with net sales up 28% ($454,272 as compared to $355,047), net income up 19% ($24,195 as compared to $20,274) and gross profit up 24% ($182,631 as compared to $147,392).

Top line sales performance was driven by the addition of new sales from the four acquisitions that the Company completed in the second half of 2017, which had a full year impact in 2018. Gross profit as a percentage of sales declined from 42% in 2017 to 40% in 2018. There were two factors driving that change. First, sales from our newly-acquired businesses generally carry lower margins when compared to the pre-existing business. Second, this reduction in gross margin on the additional sales was offset by a further improvement in our factory performance in 2018, which resulted in greater recovery of factory costs. Operating expenses rose on an absolute basis, as the Company recorded a full year of expenses related to the businesses acquired during 2017 and continued to invest in the maintenance of registrations of several important products and the development and commercialization of our SIMPAS precision application technology. When compared to net sales, operating costs improved from 34% of net sales in 2017 to 32% of net sales in 2018. Approximately 1% of this improvement relates to a $6,050 change in estimate relating to deferred consideration for acquisition made in 2017.

Due to our acquisition activities principally in the second half of 2017, our average borrowings increased in 2018, as compared to 2017. Average borrowings were also increased by the acquisitions completed in 2018. As a result, net interest expense was $4,024 in 2018, as compared to $1,941 in 2017. In addition, in 2018, we incurred $1,401 as a one-time acquisition expense as the result of the change in fair value of a derivative instrument, which related to the acquisition of the Brazilian business we acquired at the start of 2019.

Our income tax expense for 2018 ended at $9,145, as compared to $4,443 in 2017. In 2018, we incurred a one-time charge of $1,089, as a result of completing all final calculations related to the impact of the implementation of the Tax Cuts and Jobs Act ("Tax Reform Act"). In 2017, we had previously estimated that the enactment of the Tax Reform Act conferred upon the Company a one-time benefit of $3,433. During 2018, our effective tax rate (including the one-time expense just mentioned) increased to 27%, as compared to 18% in 2017. Net income increased to $0.81 per diluted share ($0.83 per basic share), as compared to $0.68 per diluted share ($0.70 per basic share) in 2017, which, as mentioned above, was aided by a one-time benefit under the Tax Reform Act.

When considering the consolidated balance sheet, long-term debt increased by $19,185 to $96,671 at December 31, 2018, as compared to $77,486 this time last year. The increased level of debt was driven by the four acquisitions completed in 2018 and particularly in the final quarter of the year. The Company’s borrowing capacity decreased to $112,150 as of December 31, 2018, as compared to $139,241 at the same time in 2017. Furthermore, inventory increased by $36,771 ($159,895, as compared to $123,124) at year-end. This was driven by inventory associated with acquisitions and expedited procurement of certain goods from China to minimize increased tariffs.

Results of Operations

2018 Compared with 2017:

	2018	2017	$ Change	% Change
Net sales:				
Insecticides	$150,595	$134,377	$16,218	12 %
Herbicides/soil fumigants/fungicides	183,350	124,529	58,821	47 %
Other, including plant growth regulators	58,360	42,503	15,857	37 %
Total crop	392,305	301,409	90,896	30 %
Non-crop	61,967	53,638	8,329	16 %
Total net sales	$454,272	$355,047	$99,225	28 %
Cost of sales:				
Insecticides	$94,340	$85,768	$8,572	10 %
Herbicides/soil fumigants/fungicides	111,298	69,866	41,432	59 %
Other, including plant growth regulators	35,681	27,883	7,798	28 %
Total crop	241,319	183,517	57,802	31 %
Non-crop	30,322	24,138	6,184	26 %
Total cost of sales	$271,641	$207,655	$63,986	31 %
Gross profit:				
Insecticides	$56,255	$48,609	$7,646	16 %
Herbicides/soil fumigants/fungicides	72,052	54,663	17,389	32 %
Other, including plant growth regulators	22,679	14,620	8,059	55 %
Gross profit crop	150,986	117,892	33,094	28 %
Gross profit non-crop	31,645	29,500	2,145	7 %
Total gross profit	$182,631	$147,392	$35,239	24 %
Gross margin crop	38 %	39 %		
Gross margin non-crop	51 %	55 %		
Total gross margin	40 %	42 %		
Net sales:				
U.S	$300,314	$256,142	$44,172	17 %
International	153,958	98,905	55,053	56 %
Total net sales	$454,272	$355,047	$99,225	28 %

Following is a more detailed discussion of our sales performance by category. Domestic sales finished the year at $300,314, as compared to $256,142 in 2017, an increase of 17%. Sales gains resulted from strong growth in our US cotton defoliant Folex®, increased sales of our soil fumigant products in light of more favorable weather conditions, as compared to the prior year and full-year sales of products (paraquat, abamectin and chlorothalonil) and businesses (OHP) acquired in 2017. These gains were offset by softness in the procurement of our corn soil insecticides (as growers shifted significant acreage to soybeans in 2018), a decrease in sales of our Thimet® granular soil insecticide (due to a 20% reduction in peanut acres in 2018), a decline in sales of our mosquito adulticide Dibrom (from the exceptional hurricane-driven demand of 2017), and a reduction in our toll manufacturing business, which will be shifted into 2019.

International sales increased 56% year-over year ($153,958 in 2018 as compared to $98,905 in 2017), driven by the full year impact of the Central American distribution business acquired in October 2017. We experienced relatively stable sales performance from our other main international products Mocap, Nemacur, Counter and Aztec.

The relative sales performance of our crop and non-crop businesses is as follows: Net sales of our crop business in 2018 were $392,305, which constitutes an increase of 30% as compared to net sales of $301,409 in 2017. Net sales of our non-crop products in 2018 were $61,967, which is an increase of approximately 16% as compared to $53,638 in 2017. A more detailed discussion of product groups and products having an effect on net sales for each of the crop and non-crop businesses appears below.

In our crop business, net sales of insecticides in 2018 ended at $150,595, which was a 12% increase, as compared to sales of $134,377 in 2017. The increase in sales was driven primarily by the full year effect of sales of our Central American distribution business acquired in the final quarter of 2017. This performance was somewhat offset by a reduction of 7% in net sales of our granular soil insecticides, as compared to net sales in 2017. Furthermore, we recorded reduced year-over-year sales for our Aztec and SmartChoice CSI products for corn and for our Thimet® used in peanuts, sugar cane and potatoes, primarily due to lower planted acres in the United States for both corn and peanuts in 2018. We had relatively flat year-over-year sales for our nematicide Counter® in the domestic corn and sugar beet segments along with slight increases in the combined international sales of Mocap® and Nemacur®. In our foliar insecticide category, we had relatively lower in-season infestation pressure, which reduced our year-over-year Bidrin® sales somewhat, but was more than offset by sales from our abamectin product line acquired in 2017.

Within the product group of herbicides/soil fumigants/fungicides, our crop net sales grew over 47% in 2018, ending at $183,350, as compared to $124,529 in 2017. Our sales growth was primarily driven by the full year effect of sales of our Central American distribution business acquired in the final quarter of 2017. In addition, our fumigant product line continued to perform well, increasing 8% above 2017, benefiting from more favorable weather conditions at the time of application in the Pacific Northwest and the Southeast United States. In the herbicide portion of this group, we had stronger performance from our traditional products Impact® and Dacthal®, and the strong performance of our newly acquired paraquat herbicide, which nearly doubled its prior year performance, in part due to the full year effect and in part related to an improved supply position. In the fungicide portions of the group, chlorothalonil, one of our newly acquired products in 2017 contributed an incremental $15,000 to the 2018 performance of this group. Finally on fungicides, chlorothalonil and PCNB, both performed well, and grew sales strongly in 2018 as compared to 2017.

Within our other product group (which includes plant growth regulators, molluscicides and third party manufacturing activity), we experienced an increase of 37% in net sales, ending at $58,360 in 2018, as compared to $42,503 in 2017. The main drivers of this performance were the inclusion of a full year AgriCenter business (acquired in November of 2017) into this grouping (adding approximately $20,000 to year-over-year net sales), in addition to a very strong year for our Folex® cotton harvest defoliant which grew approximately 26%, as compared to the prior year. These increases were partially offset by a 2018 decline in toll manufacturing activity, which will catch up in 2019.

Within our non-crop business, 2018 net sales increased by 16% to $61,967, as compared to $53,638 in 2017. This improved performance benefited from full-year sales of OHP, our new niche horticultural distribution business acquired in November of 2017. Additionally, our pre-existing non-crop product portfolio had a very solid year including Naled (our Dibrom® brand mosquito adulticide) which performed well in 2018, albeit lower than our record sales performance of 2017, which was boosted by the intense hurricane season, headlined by the persistent torrential rains of Harvey over the eastern Texas coastal region.

Our cost of sales for 2018 was $271,641 or 60% of sales. This compared to $207,655 or 58% of sales for 2017. The Company aggregates a number of key variable, semi-variable and fixed cost components within reported cost of sales. The raw materials element of our cost of sales increased slightly (up 0.6%), as compared to last year. The overall increased cost of sales was expected and relates to the change in sales mix driven by the products and businesses acquired in 2017 that recorded a full year in 2018, as compared to a partial year in 2017. In general terms the cost of sales related to the products and business acquired in 2017 tends to be higher than those of our pre-existing portfolio, because those businesses are selling fully marked up, third-party products, while the Company’s core portfolio benefits from the upstream manufacturing activity. Our manufacturing performance for the year was strong and in-line with our targets; specifically, our factory under absorption costs dropped to 0.4% of net sales in 2018, as compared to 3.6% of net sales in 2017.

Gross profit for 2018 improved by $35,239 or 24% to end at $182,631 for the year ended December 31, 2018, as compared to $147,392 for the prior year. Gross margin as a percent of net sales, however, was 40% for 2018, as compared to 42% in 2017. While the Company experienced continuous improvement in factory performance and factory cost recovery and strong performance in raw material purchasing, these benefits were offset by competitive

pricing pressure in the Midwest herbicide market and a larger volume of lower margin sales through newly acquired distribution businesses.

Operating expenses in 2018 increased by $23,012 to $143,610 or 32% of sales as compared to $120,598 or 34% in 2017. The differences in operating expenses by department are as follows:

	2018	2017	Change	% Change	
Selling	$39,585	$29,112	$10,473	36	%
General and administrative	42,981	37,660	5,321	14	%
Research, product development and regulatory	26,428	26,076	352	1	%
Freight, delivery and warehousing	34,616	27,750	6,866	25	%
	$143,610	$120,598	$23,012	19	%

- Selling expenses increased by 36% to $39,585 for the year ended December 31, 2018, as compared to $29,112 in 2017. The increased expenses were driven by expanded activities in both international and domestic sales operations resulting from acquisitions. In addition, we have continued to build our sales force both domestically and internationally to support business growth. Selling expenses as a percent of net sales remained approximately flat at 8.9% in 2018 and 2017.
- General and administrative expenses increased by 14% to $42,981 for the year ended December 31, 2018, as compared to $37,660 in 2017. The main drivers are the expanded activities (including amortization expenses) in both international and domestic businesses completed in 2017 in the amount of $6,200, increased long-term and short-term incentive compensation driven by financial performance, legal expenses associated with the Company's Takings case, and an increase in the reserves for doubtful accounts receivable in our AgriCenter business in the amount of $1,030. These increased costs were somewhat offset by the change in the estimates related to deferred consideration for the two businesses acquired in 2017 in the amount of $6,050.
- Research, product development and regulatory expenses increased by 1% to $26,428 for the year ended December 31, 2018, as compared to $26,076 in 2017. The increase is driven by activities and associated expenses of businesses acquired in 2017 and 2018 in the amount of $1,560, offset by the capitalization of certain costs ($650) in connection with the commercialization phase of our SIMPAS high technology packaging system and slightly reduced year over year expenses for regulatory affairs and business development.
- Freight, delivery and warehousing costs for the year ended December 31, 2018 increased by 25% to $34,616, as compared to $27,750 in 2017. When expressed as a percentage of sales, freight costs decreased slightly year over year to 7.6% in 2018, as compared to 7.8% in 2017. This is mainly due to product mix and locations of customers.

Net interest expense was $4,024 in 2018, as compared to $1,941 in 2017. Interest costs are summarized in the following table:

Average Indebtedness and Interest expense	2018 Average Debt	Interest Expense	Interest Rate		2017 Average Debt	Interest Expense	Interest Rate	
Working capital revolver	$93,346	$ 3,327	3.6	%	$51,103	$ 1,547	3.0	%
Interest income	—	(174)	—		—	(41)	—	
Amortization of deferred loan fees	—	235	—		—	293	—	
Amortization of other deferred liabilities	—	395	—		—	82	—	
Other interest expense	—	326	—		—	143	—	
Subtotal	93,346	4,109	4.4	%	51,103	2,024	4.0	%
Capitalized interest	—	(85)	—		—	(83)	—	
Total	$93,346	$ 4,024	4.3	%	$51,103	$ 1,941	3.8	%

The Company's average overall debt for the year ended December 31, 2018 was $93,346, as compared to $51,103 for the year ended December 31, 2017. On a gross basis, our effective interest rate increased on our working capital revolver to 3.6%, as compared to 3.0% in 2017. This increase was driven by increases in the LIBOR rate. After adjustments related to capitalized interest and including expenses related to the amortization of deferred liabilities, the overall effective rate was 4.3% for 2018, as compared to 3.8% in 2017.

On December 22, 2017, the Tax Cuts and Jobs Act (the "Tax Reform Act") was signed into law. The legislation significantly changed U.S. tax law by, among other things, lowering corporate income tax rates, implementing a territorial tax system and imposing a tax on deemed repatriated earnings of foreign subsidiaries. The Tax Reform Act reduced the U.S. corporate income tax rate from a maximum of 35% to a flat 21% rate, effective January 1, 2018. As a result of the reduction in the U.S. corporate income tax rate, we revalued our ending net deferred tax assets and liabilities at December 31, 2017, provisionally resulting in a deferred tax benefit of $4,683 that is included in the provision for income taxes for the year ended December 31, 2017. The Tax Reform Act also provided for a one-time deemed mandatory repatriation of Post-1986 undistributed foreign subsidiary earnings and profits ("E&P") through the year ended December 31, 2017. During 2017, we had performed an initial review of our foreign entities and estimated that the amount of deemed repatriated income amounts to $30,085, on which the Company included a tax expense of $1,250. During 2018, the Company obtained additional information and, as a result, adjusted its estimate. Accordingly, the amount of deemed repatriated income increased to $32,305, and the associated tax increased to $2,339 resulting in a one-time adjustment to tax expense in the amount of $1,089 related to the transition tax element of the Tax Reform Act.

Our provision for income taxes for 2018 was $9,145, as compared to $4,443 for 2017. The effective tax rate for 2018 was 27.2%, as compared to 17.9% in 2017. The increase in our effective tax rate was primarily driven by the inclusion of the one-time adjustment of $1,089 related to the transition tax element of the Tax Cuts and Jobs Act. If this transition tax adjustment were to be excluded, the effective tax rate would have been 24.0%.

The SEC staff issued Staff Accounting Bulletin 118, ("SAB 118") which provides guidance on accounting for the tax effects of the Tax Act. SAB 118 provides a measurement period that should not extend beyond one year from the Tax Act enactment date for companies to complete the accounting under Accounting Standards Codification 740 ("ASC 740"). The Company completed its assessment under SAB 118 within the one year time period as required under the guidance.

The Company is subject to U.S. federal income tax as well as to income tax in multiple state jurisdictions. Federal income tax returns of the Company are subject to International Revenue ("IRS") examination for the 2015 through 2017 tax years. State income tax returns are subject to examination for the 2014 through 2017 tax years. The Company has other foreign income tax returns subject to examination.

For the year ended December 31, 2018, the Company recorded net losses on its equity investments of $389. For 2017, the Company recorded losses on its equity investments of $49.

In 2018, our net income benefited by $133, as compared to being reduced by $87 in 2017, representing the share of net income or loss of our majority owned subsidiary that was charged to the non-controlling interest.

Net income attributable to American Vanguard ended at 24,195 or $0.81 per diluted share in 2018 as compared to $20,274 or $0.68 per diluted share in 2017.

Liquidity and Capital Resources

The Company generated $11,346 of cash from operating activities provided during the year ended December 31, 2018, as compared to $59,001 in the prior year. Included in the $11,346 are net income of $24,062, plus non-cash depreciation, amortization of intangibles and other assets and discounted future liabilities, in the amount of $24,134. In addition, stock based compensation of $5,805, loss from equity method investments of $389 and change in value of deferred income taxes of $561, provided net cash inflows of $53,829, as compared to $47,812 for the same period of 2017.

During 2018, the Company used $42,483 as a result of increasing working capital, as compared to generating $11,189 during 2017. This change excluded increases in working capital related to the products and businesses acquired during

2018. Included in this change: inventories increased by $31,440 primarily resulting from products and businesses acquired in 2017, inventories purchased ahead of potential tariff changes and some changes in customer usage in the final quarter of the year. Deferred revenue as of December 31, 2018 increased by $5,468, as compared to December 31, 2017, as a result of customer decisions to make early payments in return for early cash incentive programs. Our accounts payable balances increased by $9,097 driven by increased manufacturing activity and capital spending in the final quarter of the year and accounts receivables increased by $21,320 primarily driven by the significantly higher sales in the final three months of 2018, as compared to the same period of the prior year. In addition, prepaid expenses were reduced by $186, program accruals were reduced by $1,705 and other payables and accrued expenses were increased by $5,424.

With regard to the program accrual, these changes as noted above, primarily reflect our mix of sales and customers in 2018 as compared to the prior year. The Company accrues programs in line with the growing season upon which specific products are targeted. Typically crop products have a growing season that ends on September 30th of each year. During 2018, the Company made accruals for programs in the amount of $61,114 and made payments in the amount of $62,819. During the prior year, the Company made accruals in the amount of $59,840 and made payments in the amount of $63,716.

In 2017, inventory reduced by $16,183, accounts payables increased by $3,322, other payables increased by $3,841, accounts receivables decreased by $754, prepaid expenses reduced by $647 and deferred revenues increased by $10,726. Offsetting these positive changes, income tax payable decreased by $12,073, and accrued programs decreased by $4,529.

Cash used for investing activities was $27,697 for the year ended December 31, 2018, as compared to $89,512 in 2017. The Company spent $19,647 in business and product acquisitions including intangible assets, goodwill, working capital and fixed assets. In addition, $8,050 was spent on fixed assets primarily focused on continuing to invest in manufacturing infrastructure.

During the year ended December 31, 2018, financing activities provided $11,133, principally from the borrowings on the Company’s senior credit facility, as compared to utilizing $33,935 for the year ended December 31, 2017. This included a net borrowing of $18,975 from our credit facility in 2018, as compared to a net repayment of $37,025 in 2017. During the final quarter of the year, we paid $73 to buy out the non-controlling interest in a consolidated subsidiary. Finally, during the year, we paid dividends to stockholders amounting to $2,199 ($1,600 in 2017), and purchased the Company’s common stock at market for $7,287.

The Company has various loans in place that together constitute the long-term loan balances shown in the consolidated balance sheets as at December 31, 2018 and 2017. These are summarized in the following table:

Indebtedness $000’s	2018 Long-term	2017 Long-term
Revolving line of credit	$ 97,400	$ 78,425
Debt issuance costs	(729)	(939)
Total indebtedness	$ 96,671	$ 77,486

The Company’s main bank is Bank of the West, a wholly-owned subsidiary of the French bank, BNP Paribas. Bank of the West has been the Company’s bank for more than 30 years and is the syndication manager for the Company’s loans.

As of June 30, 2017, AMVAC Chemical Corporation (“AMVAC”), the Company’s principal operating subsidiary, as borrower, and affiliates (including the Company, AMVAC CV and AMVAC BV), as guarantors and/or borrowers, entered into a Third Amendment to Second Amended and Restated Credit Agreement (the “Credit Agreement”) with a group of commercial lenders led by Bank of the West as agent, swing line lender and Letter of Credit (“L/C”) issuer. The Credit Agreement is a senior secured lending facility, consisting of a line of credit of up to $250,000, an accordion feature of up to $100,000 and a maturity date of June 30, 2022. The Credit Agreement contains two key financial covenants; namely, borrowers are required to maintain a Consolidated Funded Debt Ratio of no more than 3.25-to-1 and a Consolidated Fixed Charge Covenant Ratio of at least 1.25-to-1. The Company’s borrowing capacity varies with its financial performance, measured in terms of EBITDA as defined in the Credit Agreement, for the trailing twelve-month period. Under the Credit Agreement, revolving loans bear interest at a variable rate based, at borrower’s election with proper notice, on either (i) LIBOR plus the “Applicable Rate” which is based upon the Consolidated Funded Debt Ratio (“Eurocurrency Rate Loan”) or (ii) the greater of (x) the Prime Rate, (y) the Federal

Funds Rate plus 0.5%, and (z) the Daily One-Month LIBOR Rate plus 1.00%, plus, in the case of (x), (y) or (z) the Applicable Rate (“Alternate Base Rate Loan”). Interest payments for Eurocurrency Rate Loans are payable on the last day of each interest period (either one, two, three or six months, as selected by the borrower) and the maturity date, while interest payments for Alternate Base Rate Loans are payable on the last business day of each month and the maturity date.

At December 31, 2018, according to the terms of the Credit Agreement and based on our performance against the most restrictive covenant listed above, the Company had the capacity to increase its borrowings by up to $112,150. This compares to an available borrowing capacity of $139,241 as of December 31, 2017. The level of borrowing capacity is driven by three factors: (1) our financial performance, as measured in EBITDA for trailing twelve-month period, (2) the inclusion of proforma EBITDA related to acquisitions completed during the preceding twelve months and (3) the leverage covenant (being the number of times EBITDA the Company may borrow under its credit facility agreement). The Company was in compliance with all the debt covenants as of December 31, 2018.

Contractual Obligations and Off-Balance Sheet Arrangements

We believe that the combination of our cash flows from operations, current cash on hand and the availability under the Company's credit facility will be sufficient to meet our working capital and capital expenditure requirements and will provide us with adequate liquidity to meet our anticipated operating needs for at least the next 12 months from the issuance of the Annual Report. Although operating activities are expected to provide cash, to the extent of growth in the future, our operating and investing activities will use cash and, consequently, this growth may require us to access some or all of the availability under the credit facility. It is also possible that additional sources of finance may be necessary to support additional growth.

The following summarizes our contractual obligations at December 31, 2018, and the effects such obligations are expected to have on cash flows in future periods:

	Payments Due by Period				
	Total	Less than 1 Year	1—3 Years	4—5 Years	After 5 Years
Long-term debt	$97,400	$—	$97,400	$—	$—
Estimated interest liability (1)	14,025	3,506	10,519	—	—
Deferred earn outs on business acquisitions	3,866	1,609	2,257	—	—
Employment agreements	2,314	928	1,386	—	—
Operating leases—rental properties and equipment	14,803	4,811	7,176	1,481	1,335
Operating leases—vehicles	2,727	1,297	1,342	88	—
Transition taxes (2)	2,152	187	374	538	1,053
	$137,287	$12,338	$120,454	$2,107	$2,388

(1) Estimated interest liability has been calculated using the current effective rate for each category of debt over the remaining term of the debt and taking into account scheduled repayments. The revolving line has been assumed to be constant (i.e. $97,400) throughout the remaining term. All of our debt is linked to LIBOR rates.

There were no other off-balance sheet arrangements as of December 31, 2018.

Under the terms of the credit facility, all debt outstanding is due when the agreement expires on June 30, 2022.

In addition to the above contractual obligations, $2,170 of unrecognized tax benefits and $2,368 of accrued penalties and interest have been recorded as long term liabilities as of December 31, 2018. We are uncertain as to if or when such amounts may be settled or any tax benefits may be realized.

(2) The Company elected to pay the transition tax related to the Tax Reform Act over an eight-year period.

Results of Operations

2017 Compared with 2016:

	2017	2016	$ Change	% Change
Net sales:				
Insecticides	$134,377	$119,226	$15,151	13 %
Herbicides/soil fumigants/fungicides	124,529	123,540	989	1 %
Other, including plant growth regulators	42,503	29,438	13,065	44 %
Total crop	301,409	272,204	29,205	11 %
Non-crop	53,638	39,909	13,729	34 %
Total net sales	$355,047	$312,113	$42,934	14 %
Cost of sales:				
Insecticides	$85,768	$78,945	$6,823	9 %
Herbicides/soil fumigants/fungicides	69,866	66,299	3,567	5 %
Other, including plant growth regulators	27,883	19,139	8,744	46 %
Total crop	183,517	164,383	19,134	12 %
Non-crop	24,138	19,442	4,696	24 %
Total cost of sales	$207,655	$183,825	$23,830	13 %
Gross profit:				
Insecticides	$48,609	$40,281	$8,328	21 %
Herbicides/soil fumigants/fungicides	54,663	57,241	(2,578)	-5 %
Other, including plant growth regulators	14,620	10,299	4,321	42 %
Gross profit crop	117,892	107,821	10,071	9 %
Gross profit non-crop	29,500	20,467	9,033	44 %
Total gross profit	$147,392	$128,288	$19,104	15 %
Gross margin crop	39 %	40 %		
Gross margin non-crop	55 %	51 %		
Total gross margin	42 %	41 %		
Net sales:				
U.S	$256,142	$228,854	$27,288	12 %
International	98,905	83,259	15,646	19 %
Total net sales	$355,047	$312,113	$42,934	14 %

Following is a more detailed discussion of our sales performance by category. Domestic sales finished the year at $256,142, as compared to $228,854 in 2016, an increase of 12%. Sales were positively impacted by strong growth in our US cotton products Bidrin® and Folex®; a stable Midwest corn soil insecticide market where procurement in the distribution channel appears to have normalized; hurricane-driven demand for our superior mosquito adulticide, Dibrom®; and $21,978 in incremental sales of newly acquired products and businesses primarily in the second half of the year. Offsetting these increases, we experienced significant competitive pricing pressure in the US post-emergent corn herbicide market for our product Impact®, and slightly lower annual sales from our soil fumigant products mainly driven by wet weather in the early part of the year in the western states.

International sales increased 19% year-over year ($98,905 in 2017 as compared to $83,259 in 2016), driven by increased sales associated with the key AgriCenter acquisition, made in October 2017, strong tolling revenues, and increased sales of Counter and Aztec. These gains were offset by slower sales of our Mocap® and Nemacur® insecticides.

The relative sales performance of our crop and non-crop businesses is as follows: Net sales of our crop business in 2017 were $301,409, which constitutes an increase of 11% as compared to net sales of $272,204 in 2016. Net sales of our non-crop products in 2017 were $53,638, which is an increase of approximately 34% as compared to $39,909 in 2016. A more detailed discussion of product groups and products having an effect on net sales for each of the crop and non-crop businesses appears below.

In our crop business, net sales of insecticides in 2017 ended at $134,377, which was a 13% increase, as compared to sales of $119,226 in 2016. For the same period, annual net sales of our granular soil insecticides were up 8% above 2016. We saw increased year-over-year sales from our Thimet® used in peanuts, sugar cane and potatoes, along with increased domestic sales of our cotton foliar insecticide, Bidrin®. We saw modest sales increases in our domestic corn soil insecticides Aztec®, SmartChoice® and Counter® offset by some modest sales declines in our international sales of Mocap® and Nemacur®. We also benefitted from the mid-year acquisition of abamectin which added net sales of approximately $2,000 to our results. In general, our overall agricultural insecticide business showed a solid performance in 2017. Finally, we recorded initial sales of our Central American distribution business which we acquired at the end of October 2017.

Within the product group of herbicides/soil fumigants/fungicides, our crop net sales in 2017 ended at $124,529, as compared to $123,540 in 2016. We recorded sales from the initial trading period of our Central American distribution business and our fumigant product line continued to perform well despite a slight year-over-year decline in revenue caused by wet weather in both the Western and Southeastern regions of the US which inhibited some on-ground application of this liquid product. In the Midwest, we experienced an intensely competitive environment during the year in the post-emergent corn herbicide market and sales of our Impact® herbicide declined when compared to the prior year. This performance was substantially offset by strong performances of both our newly acquired paraquat herbicide and our chlorothalonil fungicide. These products were acquired in mid-year and contributed over $14,000 to this category.

Within our other product group (which includes plant growth regulators, molluscicides and third party manufacturing activity) we experienced an increase of 44% in net sales, ending at $42,503 in 2017, as compared to $29,438 in 2016. The main drivers of this performance were stronger year-over-year sales of our cotton defoliant Folex® due to the 20% increase in U.S. cotton acreage in 2017 as compared to the prior year, an increase in toll manufacturing activity, and the inclusion of sales in Latin America by our newly acquired AgriCenter business.

Within our non-crop business, 2017 net sales increased by 34% to $53,638 as compared to $39,909 in 2016. The sales increase resulted from sales in the last three months of the year following the acquisition of OHP, our new niche horticultural distribution business. In addition, our core non crop product portfolio had a very solid year led by Naled sales (our Dibrom® brand mosquito adulticide) which rose 69% in 2017, as a result of the intense hurricane season, headlined by the persistent torrential rains of Harvey over the eastern Texas coastal region. In response to the emergency, AMVAC ramped up production significantly, FEMA utilized all available Dibrom inventories (both from the Company and in the market) and the resulting mosquito control operation was successful. We also recorded a 92% increase in our PCNB product sales as we continue to build our market position, an 18% increase in our Pest Strip® products, and modest increases in several of our other commercial pest control products. This performance was offset by the short-term decline in our pharmaceutical products arising from customers having ordered additional product in 2016 in light of uncertain supply conditions.

Our cost of sales for 2017 was $207,655 or 58% of sales, as compared to $183,825 or 58% of sales for 2016. The Company aggregates a number of key variable, semi-variable and fixed cost components within reported cost of sales. The raw materials element of our cost of sales remained approximately flat as compared to last year. During the year, our Impact product line endured increased competition resulting in some weakening of market price and accordingly, increased cost of sales when compared to sales revenue as a result. Furthermore, the distribution businesses acquired in the final quarter performed well and added to net sales, as indicated above. In general terms the cost of sales related to distribution activities tends to be higher than those of our core business portfolio because those businesses are selling fully marked up third party products while the Company's core portfolio benefits from the upstream manufacturing activity. Our manufacturing performance for the year was strong and in-line with our targets; specifically, our factory under absorption costs dropped to $12,865 or 3.6% of net sales in 2017 as compared to $17,739 or 5.7% of net sales in 2016.

Gross profit for 2017 improved by $19,104 or 15% to end at $147,392 for the year ended December 31, 2017, as compared to $128,288 for the prior year. Gross margin as a percent of net sales, however, was 42% for 2017, as compared to 41% in 2016. While the Company experienced continuous improvement in factory performance and factory cost recovery and strong performance on raw material purchasing, these benefits were offset by competitive pricing pressure in the Midwest herbicide market and a larger volume of lower-margin sales through newly acquired distribution businesses.

Operating expenses in 2017 increased by $12,850 to $120,598 or 34% of sales as compared to $107,748 or 35% in 2016. The differences in operating expenses by department are as follows:

	2017	2016	Change	Change
Selling	$29,112	$27,442	$1,670	6 %
General and administrative	37,660	32,128	5,532	17 %
Research, product development and regulatory	26,076	21,298	4,778	22 %
Freight, delivery and warehousing	27,750	26,880	870	3 %
	$120,598	$107,748	$12,850	12 %

- Selling expenses increased by 6% to $29,112 for the year ended December 31, 2017, as compared to $27,442 in 2016. The main drivers for the increased expenses are expanded activities in both international and domestic sales operations resulting from acquisitions. However, selling expenses as a percent of net sales actually decreased from 8.8% in 2016 to 8.2% in 2017.
- General and administrative expenses increased by 17% to $37,660 for the year ended December 31, 2017, as compared to $32,128 in 2016. The main drivers for the increase are driven by an increase in legal expenses related to the DoJ proceedings against the Company of approximately $1,200, expenses of $1,821 incurred in professional fees in connection with the product and business acquisitions completed in 2017 including; the expense of the acquisition process, increased amortization expenses as a result of the valuation of the acquisitions, and the administrative operating expenses of such acquisitions from the closing date of the respective acquisitions.
- Research, product development and regulatory expenses increased by 22% to $26,076 for the year ended December 31, 2017, as compared to $21,298 in 2016. The increase is driven by additional regulatory activity defending our expanded portfolio of products, product development studies, driven by our expanded portfolio and continued progress on the development of our SIMPAS technology.
- Freight, delivery and warehousing costs for the year ended December 31, 2017 increased by $850 to $27,750, as compared to $26,880 in 2016. When expressed as a percentage of sales, freight costs decreased slightly year over year to 7.8% in 2017, as compared to 8.6% in 2016. This is mainly due to product mix and locations of customers.

Net interest expense was $1,941 in 2017, as compared to $1,623 in 2016. Interest costs are summarized in the following table:

	2017			2016		
	Average	Interest	Interest	Average	Interest	Interest
Average Indebtedness and Interest expense	Debt	Expense	Rate	Debt	Expense	Rate
Working capital revolver	$51,103	$ 1,547	3.0 %	$59,897	$ 1,382	2.3 %
Notes payable	—	—	0.0 %	20	1	5.0 %
Interest Income	—	(41)	—	—	(7)	—
Amortization of debt issuance costs	—	293	—	—	250	—
Amortization of other deferred liabilities	—	82	—	—	37	—
Other interest expense	—	143	—	—	44	—
Subtotal	$51,103	$ 2,024	4.0 %	$59,917	$ 1,707	2.8 %
Capitalized interest	—	(83)	—	—	(84)	—
Total	$51,103	$ 1,941	2.7 %	$59,917	$ 1,623	2.7 %

The Company's average overall debt for the year ended December 31, 2017 was $51,103, as compared to $59,917 for the year ended December 31, 2016. On a gross basis, our effective interest rate increased on our working capital revolver to 3.0%, as compared to 2.3% in 2016. This increase was driven by increases in the LIBOR rate. After adjustments related to capitalized interest and including expenses related to the amortization of deferred liabilities, the overall effective rate was 3.8% for 2017 as compared to 2.7% in 2016.

On December 22, 2017, the Tax Cuts and Jobs Act (the "Tax Reform Act") was signed into law. The legislation significantly changes U.S. tax law by, among other things, lowering corporate income tax rates, implementing a territorial tax system and imposing a tax on deemed repatriated earnings of foreign subsidiaries. The Tax Reform Act reduces the U.S. corporate income tax rate from a maximum of 35% to a flat 21% rate, effective January 1, 2018. As a result of the reduction in the U.S. corporate income tax rate, we revalued our ending net deferred tax assets and liabilities at December 31, 2017, provisionally resulting in a deferred tax benefit of $4,683 that is included in the provision for income taxes for the year ended December 31, 2017. The Tax Reform Act also provided for a one-time deemed mandatory repatriation of Post-1986 undistributed foreign subsidiary earnings and profits ("E&P") through the year ended December 31, 2017. We have performed a review of our foreign entities and have estimated that the amount of deemed repatriated income amounts to $30,085, on which the Company has estimated that there will be a tax expense of $1,250. That amount is also included in the provision for income taxes for the year ended December 31, 2017. The net tax benefits from the Tax Reform Act are reflected in our financial results in accordance with Staff Accounting Bulletin No. 118 (SAB 118), which was issued to address the application of US GAAP in situations when the registrant does not have the necessary information available, prepared or analyzed (including computation) in reasonable detail to complete the accounting for uncertain income tax effects of the Tax Reform Act. Additional work is necessary for a more detailed analysis of our deferred tax assets and liabilities and of the impact of the deemed repatriation. Any subsequent adjustment to these amounts will be recorded to income tax expense in the quarter of 2018 when the analysis is complete.

Our provision for income taxes for 2017 was $4,443, as compared to $5,540 for 2016. The effective tax rate for 2017 was 18%, as compared to 30% in 2016. The decrease in the effective tax rate was primarily driven by the inclusion of the one-time net tax benefit associated with the Tax Reform Act enacted on December 22, 2017, in the amount of $3,433. The decrease is partially offset by lower percentage of earnings in jurisdictions with lower income tax rate.

The Company has effectively settled its examination with the Internal Revenue Service ("IRS") for the tax years ended December 31, 2012 through 2014. The Company's 2015 and 2016 federal income tax returns are still subject to IRS examination. The Company has other state and foreign income tax returns subject to examination.

For the year ended December 31, 2017, the Company recorded losses on its equity investment of $49. For the same period of 2016, the Company recorded losses on its equity investment of $353. In 2017, our net income was reduced by $87, as compared to $236 in 2016, representing the share of net income of our majority owned subsidiary that was charged to the non-controlling interest.

Net income attributable to American Vanguard ended at $20,274 or $0.68 per diluted share in 2017, as compared to $12,788 or $0.44 per diluted share in 2016.

Recently Issued Accounting Guidance

Please refer to Notes of Consolidated Financial Statements – Description of Business, Basis of Consolidation, Basis of Presentation and Significant Accounting Policies in the accompanying Notes to the Consolidated Financial Statements for recently issued and adopted accounting standards.

Foreign Exchange

Management does not believe that the fluctuation in the value of the dollar in relation to the currencies of its customers in the last two fiscal years has adversely affected the Company's ability to sell products at agreed upon prices denominated in U.S. dollars, where applicable. No assurance can be given, however, that adverse currency exchange rate fluctuations will not occur in the future. Should adverse currency exchange rate fluctuations occur in geographies where the Company sells/exports its products, management is not certain whether such fluctuations will or will not materially impact the Company's operating results.

Inflation

Management believes inflation has not had a significant impact on the Company's operations during the past two years. The Company is working diligently with its critical raw material suppliers to control inflationary pressures, conducting contract negotiations with focus on two key market shifts: first, the relatively stable price of oil and natural gas, combined with higher global prices for basic feed stocks like phosphorus, caustic soda, methanol and sulfur have prompted some suppliers to announce price increases to the Company, and second, the Company monitors our international suppliers for possible currency gains versus the U.S. dollar, and where appropriate uses this knowledge to forestall inflation in raw materials that are purchased in dollar terms. The Company recognizes there is long-term pressure on demand for raw materials in the developing world and is utilizing its expertise to minimize inflationary pressure. The Company has been able to push back on many of the proposed price increases for intermediates that are shipped to our US factories, to either avoid, minimize or forestall them.

CRITICAL ACCOUNTING POLICIES

Certain of the Company's policies require the application of judgment by management in selecting the appropriate assumptions for calculating financial estimates. These judgments are based on historical experience, terms of existing contracts, commonly accepted industry practices and other assumptions that the Company believes are reasonable under the circumstances. These estimates and assumptions are reviewed periodically and the effects of revisions are reflected in the consolidated financial statements in the period that revisions are determined to be necessary. Actual results may differ from these estimates under different outcomes or conditions.

The Company's critical accounting policies and estimates include:

Principles of Consolidation—The Company's Consolidated Financial Statements include the accounts of the Company and its subsidiaries. Less than wholly owned subsidiaries, including joint ventures, are consolidated when it is determined that the Company has a controlling financial interest, which is generally determined when the Company holds a majority voting interest. When protective rights, substantive rights or other factors exist, further analysis is performed in order to determine whether or not there is a controlling financial interest. The Consolidated Financial Statements reflect the assets, liabilities, revenues and expenses of consolidated subsidiaries and the non-controlling parties' ownership share is presented as a non-controlling interest. All significant intercompany accounts and transactions are eliminated.

Revenue Recognition and Allowance for Doubtful Accounts—Prior to January 1, 2018, revenues from sales were recognized at the time title and the risks of ownership passed. This was when the customer had made the fixed commitment to purchase the goods, the products were shipped per the customer's instructions, the sales price was fixed and determinable, and collection was reasonably assured. Starting January 1, 2018, revenues from sales are recognized at the time control is transferred to the customer. This is typically the case when the customer has made the fixed commitment to purchase the goods, the products are shipped per the customer's instructions, the sales price can be identified, and collection is probable. The Company has adopted procedures to ensure that revenues are recognized when earned. The procedures are subject to management's review and from time to time certain revenues are excluded until it is clear that the title has passed and there is no further recourse to the Company. We also have some arrangements whereby revenues are recognized over time for certain products that are deemed to have no alternative use accompanied by an enforceable right to payment for performance completed to date. From time to time, the Company may offer a program to eligible customers, in good standing, that provides extended payment terms on a portion of the sales on selected products. The Company analyzes these extended payment programs in connection with its revenue recognition policy to ensure all revenue recognition criteria are satisfied at the time of sale. Allowance for doubtful accounts is established based on estimates of losses related to customer receivable balances. Estimates are developed using either standard quantitative measures based on historical losses, adjusted for current economic conditions, or by evaluating specific customer accounts for risk of loss.

Accrued Program Costs— The Company offers various discounts to customers based on the volume purchased within a defined time period, other pricing adjustments, some grower volume incentives or other key performance indicator driven payments made to distributors, retailers or growers, at the end of a growing season. The Company describes these payments as "Programs." Programs are a critical part of doing business in both the US crop and non-crop chemicals market places. These discount Programs represent variable consideration. In accordance with ASC 606, revenues from sales are recorded at the net sales price, which is the transaction price, and includes estimates of variable consideration. Variable consideration includes amounts expected to be paid to its customers using the expected value method. Each quarter management compares individual sale transactions with Programs to determine what, if any, estimated program liabilities have been incurred. Once this initial calculation is made for the specific quarter, sales and marketing management, along with executive and financial management, review the accumulated Program balance and, for volume driven payments, make assessments of whether or not customers are tracking in a manner that indicates that they will meet the requirements set out in agreed upon terms and conditions attached to each Program. Following this assessment, management will make adjustments to the accumulated accrual to properly

reflect the Company’s best estimate of the liability at the balance sheet date. The majority of adjustments are made at, or close to, the end of the crop season, at which time customer performance can be more fully assessed. Programs are paid out predominantly on an annual basis, usually in the final quarter of the financial year or the first quarter of the following year. The Company recorded accrued programs of $37,349 at December 31, 2018, as compared to $39,054 at December 31, 2017.

Inventories — The Company values its inventories at lower of cost or net realizable value. Cost is determined by the first-in, first-out (“FIFO”) method, including, as appropriate, material, labor, factory overhead and subcontracting services. The Company writes down and makes adjustments to its inventory net realizable value following assessments of slow moving and obsolete inventory and other annual adjustments to ensure that our standard costs continue to closely reflect manufacturing cost. The Company recorded an inventory reserve allowance of $1,989 at December 31, 2018, as compared to $3,137 at December 31, 2017.

Long-lived Assets— Long-lived assets primarily consist of the costs of proprietary returnable packaging assets including SmartBox and Lock and Load containers. The carrying values of long-lived assets are reviewed for impairment quarterly and/or whenever events or changes in circumstances indicate that the carrying value of such assets may not be recoverable. The Company evaluates recoverability of an asset group by comparing the carrying value to the future undiscounted cash flows that it expects to generate from the asset group. If the comparison indicates that the carrying value of an asset group is not recoverable, measurement of the impairment loss is based on the fair value of the asset. There were no circumstances that would indicate any impairment of the carrying value of these long-lived assets and no material impairment losses were recorded in 2018 or 2017.

Property, Plant and Equipment and Depreciation— Property, plant and equipment includes the cost of land, buildings, machinery and equipment, office furniture and fixtures, automobiles, construction projects and significant improvements to existing plant and equipment. Interest costs related to significant construction projects are capitalized at the Company's current weighted average effective interest rate. Expenditures for minor repairs and maintenance are expensed as incurred. When property or equipment is sold or otherwise disposed of, the related cost and accumulated depreciation are removed from the respective accounts and the gain or loss realized on disposition is reflected in earnings. All plant and equipment is depreciated using the straight-line method, utilizing the estimated useful property lives. Once placed into service, building lives range from 10 to 30 years; machinery and equipment lives range from 3 to 15 years. During the years ended December 31, 2018, 2017 and 2016 the Company eliminated from assets and accumulated depreciation $4,057, $6,317, and $16,652, respectively, of fully depreciated assets.

Foreign Currency Translation— Assets and liabilities of foreign subsidiaries, where the local currency is the functional currency, have been translated at period end exchange rates, and profit and loss accounts have been translated using weighted average yearly exchange rates. Adjustments resulting from translation have been recorded in the equity section of the balance sheet as cumulative translation adjustments in other comprehensive income (loss). The effects of foreign currency exchange gains and losses on transactions that are denominated in currencies other than the Company's functional currency, including transactions denominated in the local currencies of the Company's international subsidiaries where the functional currency is the U.S. dollar, are remeasured to the functional currency using the end of the period exchange rates. The effects of remeasurement related to foreign currency transactions are included in operations.

Goodwill and Other Intangible Assets—The primary identifiable intangible assets of the Company relate to assets associated with its product and business acquisitions. The Company adopted the provisions of ASC 350, effective in January 1, 2018, under which identifiable intangibles with finite lives are amortized and those with indefinite lives are not amortized. The estimated useful life of an identifiable intangible asset to the Company is based upon a number of factors including the effects of demand, competition, and expected changes in the marketability of the Company's products. The Company re-evaluates whether these intangible assets are impaired on both a quarterly and an annual basis and anytime when there is a specific indicator for impairment, relying on a number of factors including operating results, business plans and future cash flows. Identifiable intangible assets that are subject to amortization are evaluated for impairment using a process similar to that used to evaluate long-lived assets. The impairment test for identifiable intangible assets not subject to amortization consists of either a qualitative assessment or a comparison of the fair value of the intangible asset with its carrying amount. An impairment loss, if any, is recognized for the amount by which the carrying value exceeds the fair value of the asset. Fair value is typically estimated using a discounted cash flow analysis. When determining future cash flow estimates, the Company considers historical results adjusted to reflect current and anticipated operating conditions. Estimating future cash flows requires significant judgment by the Company, in such areas as: future economic conditions, industry-specific conditions, product pricing and necessary capital expenditures. The use of different assumptions or estimates for future cash flows could produce different impairment amounts (or none at all) for long-lived assets, goodwill and identifiable intangible assets. The Company performed impairment reviews for the years ended December 31, 2018, 2017 and 2016 and no material impairment losses were recorded.

The Company reviews goodwill for impairment utilizing either a qualitative assessment or a two-step process. If the Company decides that it is appropriate to perform a qualitative assessment and concludes that the fair value of a reporting unit more likely than not exceeds its carrying value, no further evaluation is necessary. If the Company performs the two-step process, the first step of the goodwill impairment test is used to identify potential impairment by comparing the fair value of a reporting unit with its carrying amount, including goodwill. If the fair value of a reporting unit exceeds its carrying amount, goodwill of the reporting unit is considered not impaired and the second step of the impairment test is unnecessary. If the carrying amount of a reporting unit exceeds its fair value, the second step is performed to measure the amount of impairment by comparing the carrying amount of the goodwill to a determination of the implied value of the goodwill. If the carrying amount of goodwill is greater than the implied value, an impairment charge is recognized for the difference. The Company annually tests goodwill for impairment in beginning of the fourth quarter. The Company did not record any impairment losses.

Income taxes—Income tax expense, deferred tax assets and liabilities, and liabilities for unrecognized tax benefits reflect management's best estimate of current and future taxes to be paid. The Company is subject to income taxes in the United States and numerous foreign jurisdictions. The Company assessed the realizability of deferred tax assets and determined that based on the available evidence, including a history of taxable income and estimates of future taxable income, it is more likely than not that the deferred tax assets will be realized. Significant management judgment is required in determining the provision for income taxes and deferred tax assets and liabilities. In the event that actual results differ from these estimates, we will adjust these estimates in future periods, which may result in a change in the effective tax rate in a future period. Accounting for income taxes involves uncertainty and judgment on how to interpret and apply tax laws and regulations within the Company's annual tax filings. Such uncertainties from time to time may result in a tax position that may be challenged and overturned by a tax authority in the future, which could result in additional tax liability, interest charges and possibly penalties. The Company classifies interest and penalties as a component of income tax expense.

ITEM 7A QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

The Company is exposed to market risk related to changes in interest rates, primarily from its borrowing activities. The Company's indebtedness to its primary lender is evidenced by a line of credit with a variable rate of interest, which fluctuates with changes in the lender's reference rate (LIBOR). The Company may use derivative financial instruments for trading purposes to protect trading performance from exchange rate fluctuations on material contracts, though there are no such instruments in place during any periods presented in this Annual Report.

The Company conducts business in various foreign currencies, primarily when doing business in Europe, Mexico, Central and South America. Therefore changes in the value of the currencies of such countries or regions affect the Company's financial position and cash flows when translated into U.S. Dollars. The Company has mitigated, and will continue to mitigate, a portion of its currency exchange exposure through natural hedges based on the operation of decentralized foreign operating companies in which the majority of all costs are local-currency based. A 10% change in the value of all foreign currencies would have an immaterial effect on the Company's financial position and cash flows. As part of an on-going process of assessing business risk, management has identified risk factors which are disclosed in Item 1A. Risk Factors of this Report on Form 10-K.

ITEM 8 FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

The Financial Statements and Supplementary Data required by this item are listed at Part IV, Item 15, Exhibits, and Financial Statement Schedules.

ITEM 9 CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

None.

ITEM 9A CONTROLS AND PROCEDURES

Disclosure Controls and Procedures

Management, under the supervision of the Company's Chief Executive Officer and Chief Financial Officer, periodically evaluate the effectiveness of the design and operation of the Company's disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)). Based upon this evaluation, as of December 31, 2018, the Chief Executive Officer and the Chief Financial Officer have concluded that these disclosure controls and procedures are effective in ensuring that the information required to be disclosed in reports filed under the Securities Exchange Act of 1934 is (i) recorded, processed, summarized and reported on a timely basis, and (ii) accumulated and communicated to the Company's management, including the Chief Executive Officer and Chief Financial Officer, as appropriate to allow timely decisions regarding required disclosure.

Management's Report on Internal Control over Financial Reporting

Management of the Company is responsible for establishing and maintaining adequate internal control over financial reporting as defined in Rules 13a-15(f) and 15d-15(f) of the Securities Exchange Act of 1934 for the Company. The Company's internal control system over financial reporting is designed to provide reasonable assurance to management and the Board of Directors as to the fair, reliable and timely preparation and presentation of consolidated financial statements in accordance with accounting principles generally accepted in the United States of America filed with the SEC.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Therefore, even processes determined to be effective can provide only reasonable assurance with respect to the financial statement preparation and presentation.

Management conducted an evaluation of the Company's internal controls over financial reporting based on a framework set forth by the Committee of Sponsoring Organizations of the Treadway Commission in Internal Control—Integrated Framework (2013). This evaluation included review of the documentation of controls, evaluation of the design effectiveness of controls, testing of the effectiveness of controls and a conclusion on the evaluation. Based on this evaluation, management believes that as of December 31, 2018, the Company's internal control over financial reporting is effective.

Management assessment of the effectiveness of the Company's internal control over financial reporting as of December 31, 2018, excluded TyraTech, which was acquired by the Company in the fourth quarter of 2018. Total assets and total sales each constituted less than 1% of the consolidated total assets and total sales and were included in the Company's consolidated total assets and the Company's consolidated sales, as of and for the year ended December 31, 2018. Companies are allowed to exclude acquisitions from their assessment of internal control over financial reporting during the first year of an acquisition while integrating the acquired company under guidelines established by the SEC. The Company has elected to exclude this acquisition from its assessment of internal controls over financial reporting.

BDO USA, LLP, the independent registered public accounting firm that audited the consolidated financial statements included in the Annual Report on Form 10-K, was engaged to attest to and report on the effectiveness of AVD's internal control over financial reporting as of December 31, 2018. Its report is included herein.

Changes in Internal Controls over Financial Reporting

There were no changes in internal controls over financial reporting during the quarter ended December 31, 2018 that have materially affected, or are reasonably likely to materially affect, the Company's internal control over financial reporting.

Report of Independent Registered Public Accounting Firm

Shareholders and Board of Directors

American Vanguard Corporation

Newport Beach, California

Opinion on Internal Control over Financial Reporting

We have audited American Vanguard Corporation's (the "Company's") internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (the "COSO criteria"). In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2018, based on the COSO criteria.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) ("PCAOB"), the consolidated balance sheets of the Company and subsidiaries as of December 31, 2018 and 2017, the related consolidated statements of operations, comprehensive income, stockholders' equity, and cash flows for each of the three years in the period ended December 31, 2018, and the related notes and schedule and our report dated March 12, 2019 expressed an unqualified opinion thereon.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Item 9A, Management's Report on Internal Control over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit of internal control over financial reporting in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audit also included performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

As indicated in the accompanying Item 9A, Management's Report on Internal Control over Financial Reporting, management's assessment of and conclusion on the effectiveness of internal control over financial reporting did not include the internal controls of TyraTech, Inc. ("TyraTech"), which was acquired on November 8, 2018, and which is included in the consolidated balance sheet of the Company and subsidiaries as of December 31, 2018, and the related consolidated statements of operations, comprehensive income, stockholders' equity, and cash flows for the year then ended. TyraTech constituted less than 1% of total assets and total sales as of and for the year ended December 31, 2018. Management did not assess the effectiveness of internal control over financial reporting of the TyraTech because of the timing of the acquisition. Our audit of internal control over financial reporting of the Company also did not include an evaluation of the internal control over financial reporting of TyraTech.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ BDO USA, LLP

Costa Mesa, California

March 12, 2019

AMERICAN VANGUARD CORPORATION

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ITEM 9B OTHER INFORMATION

None.

PART III

ITEM 10 DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

The information set forth under the captions “Executive Officers of the Company,” “Election of Directors,” “Information about the Board of Directors and Committees of the Board” and “Transactions with Management and Others—Section 16(a) Beneficial Ownership Reporting Compliance” in our definitive proxy statement for our Annual Meeting of Stockholders to be held on June 5, 2019 (the “Proxy Statement”), which will be filed with the SEC within 120 days of the end of our fiscal year ended December 31, 2018, is incorporated herein by reference.

ITEM 11 EXECUTIVE COMPENSATION

Except as specifically provided, the information set forth under the captions “Compensation of Executive Officers” and “Information about the Board of Directors and Committees of the Board—Compensation of Directors” in the Proxy Statement is incorporated herein by reference.

ITEM 12 SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

The disclosure contained in Part II, Item 5 under “Equity Compensation Plan Information” is incorporated herein by reference. Information regarding security ownership of certain beneficial owners and management is incorporated by reference to the information set forth under the caption “Security Ownership of Certain Beneficial Owners and Management” in the Proxy Statement.

ITEM 13 CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE

The information set forth under the captions “Transactions with Management and Others” and “Information about the Board of Directors and Committees of the Board” in the Proxy Statement is incorporated herein by reference.

ITEM 14 PRINCIPAL ACCOUNTANT FEES AND SERVICES

Information regarding principal accountant fees and services is incorporated herein by reference to the information set forth under the caption “Ratification of the Selection of Independent Registered Public Accounting Firm—Relationship of the Company with Independent Registered Public Accounting Firm” in the Proxy Statement.

AMERICAN VANGUARD CORPORATION

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PART IV

ITEM 15 EXHIBITS AND FINANCIAL STATEMENT SCHEDULES

(a) The following documents are filed as part of this report:

Index to Consolidated Financial Statements and Supplementary Data:

Description	Page No
Financial Statements:	
Report of Independent Registered Public Accounting Firm	42
Consolidated Balance Sheets as of December 31, 2018 and 2017	43
Consolidated Statements of Operations for the Years Ended December 31, 2018, 2017, and 2016	44
Consolidated Statements of Comprehensive Income for the Years Ended December 31, 2018, 2017, and 2016	45
Consolidated Statements of Stockholders' Equity for the Years Ended December 31, 2018, 2017 and 2016	46
Consolidated Statements of Cash Flows for the Years Ended December 31, 2018, 2017, and 2016	47
Summary of Significant Accounting Policies and Notes to Consolidated Financial Statements	48

(b) Exhibits Index

AMERICAN VANGUARD CORPORATION

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EXHIBIT INDEX

ITEM 15

Exhibit Number	Description of Exhibit
3.1	Amended and Restated Certificate of Incorporation of American Vanguard Corporation (filed as Exhibit 3.1 to the Company's Form 10-K for the year ended December 31, 2003, which was filed on March 30, 2004 with the Securities Exchange Commission and incorporated herein by reference).
3.2	Certificate of Amendment of Amended and Restated Certificate of Incorporation of American Vanguard Corporation (filed as Exhibit 3.2 to the Company's Form 10-Q/A for the period ended June 30, 2004, which was filed with the Securities Exchange Commission on February 23, 2005 and incorporated herein by reference).
3.3	Amended and Restated Bylaws of American Vanguard Corporation dated as of June 5, 2014 (filed as Exhibit 99.1 to the Company's Form 8-K, which was filed with the Securities Exchange Commission on June 7, 2014 and incorporated herein by reference.)
4	Form of Indenture (filed as Exhibit 4.4 to the Company's Registration Statement on Form S-3 (File No. 333-122981) and incorporated herein by reference).
10.1	American Vanguard Corporation Employee Stock Purchase Plan (filed as Appendix A to the Company's Proxy Statement filed with the Securities and Exchange Commission on April 23, 2018 and incorporated herein by reference).
10.2	American Vanguard Corporation Amended and Restated Stock Incentive Plan as of June 8, 2016 (filed as Appendix A to the Company's Proxy Statement filed with the Securities and Exchange Commission on April 25, 2016 and incorporated herein by reference).
10.3	Form of Incentive Stock Option Agreement under the American Vanguard Corporation Fourth Amended and Restated Stock Incentive Plan , (filed as Exhibit 10.3 with the Company's Annual Report on Form 10-K for the period ended December 31, 2004, which was filed with the Securities and Exchange Commission on March 16, 2005 and incorporated herein by reference).
10.4	Form of Non-Qualified Stock Option Agreement under the American Vanguard Corporation Fourth Amended and Restated Stock Incentive Plan , (filed as Exhibit 10.4 with the Company's Annual Report on Form 10-K for the period ended December 31, 2004, which was filed with the Securities and Exchange Commission on March 16, 2005 and incorporated herein by reference).
10.5	

Employment Agreement between American Vanguard Corporation and Eric G. Wintemute dated January 15, 2008 (filed as Exhibit 10.5 to the Company's Annual Report on Form 10-K for the year ended December 31, 2007, which was filed with the Securities Exchange Commission on March 17, 2008 and incorporated herein by reference).

10.8 Form of Change of Control Severance Agreement, dated effective as of January 1, 2004, between American Vanguard Corporation and its executive and senior officers (filed as Exhibit 10.2 to the Company's Form 10-Q for the period ended March 31, 2004, which was filed with the Securities Exchange Commission on May 17, 2004 and incorporated herein by reference.)

10.9 Form of Amendment of Change of Control Severance Agreement, dated effective as of July 11, 2008, between American Vanguard Corporation and named executive officers and senior officers (filed as Exhibit 99.1 to the Company's Form 8-K, which was filed on July 11, 2008 with the Securities and Exchange Commission and incorporated herein by reference).

10.10 Form of Indemnification Agreement between American Vanguard Corporation and its Directors (as filed as Exhibit 10.7 to the Company's Annual Report on Form 10-K for the period ended December 31, 2004, which was filed with the Securities and Exchange Commission on March 16, 2005 and incorporated herein by reference).

10.11 Description of Compensatory Arrangements Applicable to Non-Employee Directors (as set forth on page 32 of the Company's Proxy Statement which was filed with the Securities and Exchange Commission on April 23, 2018 and incorporated herein by reference).

AMERICAN VANGUARD CORPORATION

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Exhibit Number	Description of Exhibit
10.13	Form of Restricted Stock Agreement between American Vanguard Corporation and named executive officers (filed as Exhibit 99.1 to the Company's Form 8-K, which was filed with the Securities Exchange Commission on July 24, 2008 and incorporated herein by reference).
10.14	Form of Amended and Restated Change of Control Severance Agreement effective as of January 1, 2014 (filed as Exhibit 10.14 to the Company's 10-K, which was filed with the Securities Exchange Commission on February 28, 2014 and incorporated herein by reference).
10.15	Form of American Vanguard Corporation Amended and Restated Stock Incentive Plan TSR-Based Restricted Stock Units Award Agreement dated June 6, 2013 (filed as Exhibit 10.15 to the Company's 10-K, which was filed with the Securities Exchange Commission on February 28, 2014 and incorporated herein by reference).
10.16	Form of American Vanguard Corporation Amended and Restated Stock Incentive Plan Performance-Based Restricted Stock Units Award Agreement dated June 6, 2013 (filed as Exhibit 10.16 to the Company's 10-K, which was filed with the Securities Exchange Commission on February 28, 2014 and incorporated herein by reference).
10.17	Third Amendment to Second Amended and Restated Credit Agreement dated as of June 30, 2017 among AMVAC and certain affiliates on the other hand, and a group of commercial lenders led by Bank of the West as agent, swing line lender, and letter of credit issuer, on the other hand (filed as Exhibit 10.1 to the Company's Form 8-K, which was filed with the Securities Exchange Commission on July 6, 2017 and is incorporated herein by reference).
21	List of Subsidiaries of the Company.*
23	Consent of BDO USA, LLP, Independent Registered Public Accounting Firm.*
31.1	Certification of Chief Executive Officer Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.*
31.2	Certification of Chief Financial Officer Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.*
32.1	Certifications Pursuant to 18 U.S.C. Section 1350 as adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.*
101	The following materials from American Vanguard Corp's Annual Report on Form 10-K for the year ended December 31, 2018, formatted in XBRL (Extensible Business Reporting Language): (i) Consolidated Balance Sheets; (ii) Consolidated Statements of Operations; (iii) Consolidated Statements of Stockholders' Equity; (iv) Consolidated Statements of Comprehensive Income; (v) Consolidated Statements of Cash Flows; and (vi) Notes to Consolidated Financial Statements, tagged as blocks of text.*

* Filed herewith.

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AMERICAN VANGUARD CORPORATION

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(c) Valuation and Qualifying Accounts:

Schedule II-A—Valuation and Qualifying Accounts

Allowance for Doubtful Accounts Receivable (in thousands)

Fiscal Year Ended	Balance at Beginning of Period	Additions Charged to Costs and Expenses	Deductions	Balance at End of Period
December 31, 2018	$ 46	$ 1,217	$ —	$ 1,263
December 31, 2017	$ 42	$ 31	$ (27)	$ 46
December 31, 2016	$ 423	$ 3	$ (384)	$ 42

Inventory Reserve (in thousands)

Fiscal Year Ended	Balance at Beginning of Period	Additions	Deductions	Balance at End of Period
December 31, 2018	$ 3,137	476	$ (1,624)	$ 1,989
December 31, 2017	$ 3,594	—	$ (457)	$ 3,137
December 31, 2016	$ 4,020	—	$ (426)	$ 3,594

See accompanying report of independent registered public accounting firm on page 41 of this annual report.

ITEM 16 FORM 10-K SUMMARY

None

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AMERICAN VANGUARD CORPORATION

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SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, American Vanguard Corporation has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

AMERICAN VANGUARD CORPORATION

(Registrant)

By: /s/ ERIC G. WINTEMUTE Eric G. Wintemute Chief Executive Officer and Chairman of the Board March 12, 2019	By: /s/ DAVID T. JOHNSON David T. Johnson Chief Financial Officer and Principal Accounting Officer March 12, 2019

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the Registrant and in the capacities indicated.

By: /s/ ERIC G. WINTEMUTE Eric G. Wintemute Principal Executive Officer and Chairman of the Board March 12, 2019	By: /s/ DAVID T. JOHNSON David T. Johnson Principal Financial Officer and Principal Accounting Officer March 12, 2019
By: /s/ DEBRA EDWARDS Debra Edwards Director March 12, 2019	By: /s/ JOHN L. KILLMER John L. Killmer Director March 12, 2019
By: /s/ LAWRENCE S. CLARK Lawrence S. Clark	By: /s/ SCOTT D. BASKIN Scott D. Baskin

Director	Director
March 12, 2019	March 12, 2019
By: /s/ MORTON D. ERLICH	By: /s/ ALFRED INGULLI
Morton D. Erlich	Alfred Ingulli
Director	Director
March 12, 2019	March 12, 2019
By: /s/ ESMAIL ZIRAKPARVAR	
Esmail Zirakparvar	
Director	
March 12, 2019	

AMERICAN VANGUARD CORPORATION

AND SUBSIDIARIES

Report of Independent Registered Public Accounting Firm

Shareholders and Board of Directors

American Vanguard Corporation

Newport Beach, California

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of American Vanguard Corporation (the "Company") and subsidiaries as of December 31, 2018 and 2017, the related consolidated statements of operations, comprehensive income, stockholders' equity, and cash flows for each of the three years in the period ended December 31, 2018, and the related notes and financial statement schedule listed in the accompanying index (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company and subsidiaries at December 31, 2018 and 2017, and the results of their operations and their cash flows for each of the three years in the period ended December 31, 2018, in conformity with accounting principles generally accepted in the United States of America.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) ("PCAOB"), the Company's internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO") and our report dated March 12, 2019 expressed an unqualified opinion thereon.

Change in Accounting Method Related to Revenue Recognition

As discussed in notes to the consolidated financial statements, the Company has changed its method of accounting for recognition of revenues and related disclosures in 2018 due to the adoption of Accounting Standards Codification 606, Revenue from Contracts with Customers.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's consolidated financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud.

Our audits included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ BDO USA, LLP

We have served as the Company's auditor since 1991.

Costa Mesa, California

March 12, 2019

AMERICAN VANGUARD CORPORATION

AND SUBSIDIARIES

CONSOLIDATED BALANCE SHEETS

December 31, 2018 and 2017

(In thousands, except share data)

	2018	2017
Assets		
Current assets:		
Cash and cash equivalents	$6,168	$11,337
Receivables:		
Trade, net of allowance for doubtful accounts of $1,263 and $46, respectively	123,320	102,534
Other	10,709	7,071
	134,029	109,605
Inventories, net	159,895	123,124
Prepaid expenses	10,096	10,817
Total current assets	310,188	254,883
Property, plant and equipment, net	49,252	49,321
Intangible assets, net of applicable amortization	186,583	180,950
Goodwill	25,790	22,184
Other assets	21,774	28,254
Total assets	$593,587	$535,592
Liabilities and Stockholders’ Equity		
Current liabilities:		
Current installments of other liabilities	$1,609	$5,395
Accounts payable	66,535	53,748
Deferred revenue	20,043	14,574
Accrued program costs	37,349	39,054
Accrued expenses and other payables	15,962	12,061
Income taxes payable	4,030	1,370
Total current liabilities	145,528	126,202
Long-term debt	96,671	77,486
Other liabilities, excluding current installments	6,795	10,306
Deferred income tax liabilities, net	15,363	16,284
Total liabilities	264,357	230,278
Commitments and contingent liabilities		
Stockholders’ equity:		
Preferred stock, $.10 par value per share; authorized 400,000 shares; none issued	—	—
Common stock, $.10 par value per share; authorized 40,000,000 shares; issued 32,752,827 shares in 2018 and 32,241,866 shares in 2017	3,276	3,225
Additional paid-in capital	83,177	75,658
Accumulated other comprehensive loss	(4,507)	(4,507)

Retained earnings	262,840	238,953
	344,786	313,329
Less treasury stock at cost, 2,902,992 shares in 2018 and 2,450,634 shares in 2017	(15,556)	(8,269)
American Vanguard Corporation stockholders’ equity	329,230	305,060
Non-controlling interest	—	254
Total stockholders’ equity	329,230	305,314
Total liabilities and stockholders’ equity	$593,587	$535,592

See summary of significant accounting policies and notes to consolidated financial statements.

AMERICAN VANGUARD CORPORATION

AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF OPERATIONS

Years ended December 31, 2018, 2017 and 2016

(In thousands, except per share data)

	2018	2017	2016
Net sales	$454,272	$355,047	$312,113
Cost of sales	271,641	207,655	183,825
Gross profit	182,631	147,392	128,288
Operating expenses	143,610	120,598	107,748
Operating income	39,021	26,794	20,540
Change in fair value of derivative instrument	1,401	—	—
Interest expense, net	4,024	1,941	1,623
Income before provision for income taxes and loss on equity investments	33,596	24,853	18,917
Provision for income taxes	9,145	4,443	5,540
Income before loss on equity investments	24,451	20,410	13,377
Less net loss from equity method investments	389	49	353
Net income	24,062	20,361	13,024
Net loss (income) attributable to non-controlling interest	133	(87)	(236)
Net income attributable to American Vanguard	$24,195	$20,274	$12,788
Earnings per common share—basic	$0.83	$0.70	$0.44
Earnings per common share—assuming dilution	$0.81	$0.68	$0.44
Weighted average shares outstanding—basic	29,326	29,100	28,859
Weighted average shares outstanding—assuming dilution	30,048	29,703	29,394

See summary of significant accounting policies and notes to consolidated financial statements.

AMERICAN VANGUARD CORPORATION

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CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

Years ended December 31, 2018, 2017 and 2016

(In thousands)

	2018	2017	2016
Net income	$24,062	$20,361	$13,024
Other comprehensive income			
Foreign currency translation adjustment income (loss)	—	344	(1,310)
Comprehensive income	24,062	20,705	11,714
Less: Comprehensive (income) loss attributable to non-controlling interest	(133)	87	236
Comprehensive income attributable to American Vanguard	$24,195	$20,618	$11,478

See summary of significant accounting policies and notes to consolidated financial statements

AMERICAN VANGUARD CORPORATION

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CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY

Years ended December 31, 2018, 2017 and 2016

(In thousands, except share data)

	Common Stock		Additional	Accumulated Other	Retained	Treasury Stock		AVD	Non-	
	Shares	Amount	Paid-in Capital	Comprehensive Income/(loss)	Earnings	Shares	Amount	Total	Controlling Interest	Total
Balance, December 31, 2015	31,638,225	$3,164	$68,534	$(3,541)	$208,507	2,450,634	$(8,269)	$268,395	$(69)	$268,326
Stocks issued under ESPP	42,730	4	558	—	—	—	—	562	—	562
Cash dividends on common stock ($0.03 per share)	—	—	—	—	(867)	—	—	(867)	—	(867)
Foreign currency translation adjustment, net	—	—	—	(1,310)	—	—	—	(1,310)	—	(1,310)
Stock based compensation	—	—	3,167	—	—	—	—	3,167	—	3,167
Stock options exercised; grants, termination, and vesting of restricted stock units (net of shares in lieu of taxes)	138,740	15	(336)	—	—	—	—	(321)	—	(321)
Tax effect from share based	—	—	(224)	—	—	—	—	(224)	—	(224)

compensation										
Net income	—	—	—	—	12,788	—	—	12,788	236	13,024
Balance, December 31, 2016	31,819,695	3,183	71,699	(4,851)	220,428	2,450,634	(8,269)	282,190	167	282,357
Stocks issued under ESPP	34,016	4	551	—	—	—	—	555	—	555
Cash dividends on common stock ($0.06 per share)	—	—	—	—	(1,749)	—	—	(1,749)	—	(1,749)
Foreign currency translation adjustment, net	—	—	—	344	—	—	—	344	—	344
Stock based compensation	—	—	4,714	—	—	—	—	4,714	—	4,714
Stock options exercised; grants, termination, and vesting of restricted stock units (net of shares in lieu of taxes)	388,155	38	(1,306)	—	—	—	—	(1,268)	—	(1,268)
Net income	—	—	—	—	20,274	—	—	20,274	87	20,361
Balance, December 31, 2017	32,241,866	3,225	75,658	(4,507)	238,953	2,450,634	(8,269)	305,060	254	305,314
Adjustment to recognize new revenue recognition standard, net of tax	—	—	—	—	2,214	—	—	2,214	—	2,214
Adjustment to recognize new standard on taxes on foreign asset transfers	—	—	—	—	(180)	—	—	(180)	—	(180)
Stocks issued under ESPP	35,950	2	668	—	—	—	—	670	—	670
Cash dividends on common stock ($0.08 per share)	—	—	—	—	(2,342)	—	—	(2,342)	—	(2,342)

Stock based compensation	—	—	5,805	—	—	—	—	5,805	—	5,805
Stock options exercised; grants, termination, and vesting of restricted stock units (net of shares in lieu of taxes)	475,011	49	998	—	—	—	—	1,047	—	1,047
Non-controlling interest			48					48	(121)	(73)
Shares repurchased	—	—	—	—	—	452,358	(7,287)	(7,287)		(7,287)
Net income	—	—	—	—	24,195	—	—	24,195	(133)	24,062
Balance, December 31, 2018	32,752,827	$3,276	$83,177	$(4,507)	$262,840	2,902,992	$(15,556)	$329,230	$—	$329,230

See summary of significant accounting policies and notes to consolidated financial statements

AMERICAN VANGUARD CORPORATION

AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF CASH FLOWS

Years ended December 31, 2018, 2017 and 2016

(In thousands)

	2018	2017	2016
Increase cash			
Cash flows from operating activities:			
Net income	$24,062	$20,361	$13,024
Adjustments to reconcile net income to net cash provided by (used in) operating activities:			
Depreciation and amortization of fixed and intangible assets	18,891	16,959	16,327
Amortization of other long term assets and debt issuance costs	4,884	5,221	5,203
Amortization of discounted liabilities	359	110	16
Stock-based compensation	5,805	4,714	3,167
Excess tax benefit from share based compensation	—	—	(96)
(Decrease) increase in deferred income taxes	(561)	398	(151)
Operating loss from equity method investments	389	49	353
Changes in assets and liabilities associated with operations, net of business combinations:			
(Increase) decrease in net receivables	(21,320)	754	(11,817)
(Increase) decrease in inventories	(31,440)	16,183	15,901
Decrease (increase) decrease in income tax receivable/payable, net	2,655	(12,073)	1,186
Decrease (increase) in prepaid expenses and other assets	186	647	(3,872)
Increase in accounts payable	9,097	3,322	9,015
Increase (decrease) in deferred revenue	5,468	10,726	(5,040)
Decrease in accrued program costs	(1,705)	(4,529)	(1,441)
(Decrease) increase in other payables	(5,424)	(3,841)	4,631
Net cash provided by operating activities	11,346	59,001	46,406
Cash flows from investing activities:			
Capital expenditures	(8,050)	(6,666)	(10,630)
Investments	—	(950)	(3,283)
Acquisitions of businesses and intangible assets	(19,647)	(81,896)	(224)
Net cash used in investing activities	(27,697)	(89,512)	(14,137)
Cash flows from financing activities:			
Payments under line of credit agreement	(117,325)	(103,975)	(107,600)
Borrowings under line of credit agreement	136,300	141,000	80,000
Debt issuance cost	—	(751)	—
Cash paid to acquire non-controlling interest	(73)	—	—
Payment on other long-term liabilities	—	(26)	(704)

Excess tax benefit from share based compensation	—	—	96
Net payment from the issuance of common stock (sale of stock under ESPP, exercise of stock options and shares purchased for tax withholding)	1,717	(713)	241
Treasury shares	(7,287)	—	—
Payment of cash dividends	(2,199)	(1,600)	(578)
Net cash provided by (used in) financing activities	11,133	33,935	(28,545)
Net (decrease) increase in cash and cash equivalents	(5,218)	3,424	3,724
Effect of exchange rate changes on cash and cash equivalents	49	44	(1,379)
Cash and cash equivalents at beginning of year	11,337	7,869	5,524
Cash and cash equivalents at end of year	$6,168	$11,337	$7,869
Supplemental cash flow information:			
Cash paid during the year for:			
Interest	$3,319	$1,500	$1,748
Income taxes, net	$8,449	$17,841	$4,947
Non-cash investing activities:			
Consideration paid in January 2019 in connection with an asset acquisition completed in 2018	$3,530	$—	$—

See summary of significant accounting policies and notes to the consolidated financial statements

AMERICAN VANGUARD CORPORATION

AND SUBSIDIARIES

SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES AND

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Years Ended December 31, 2018, 2017 and 2016

(Dollars in thousands, except per share data)

Description of Business, Basis of Consolidation, Basis of Presentation and Significant Accounting Policies

American Vanguard Corporation (the "Company" or "AVD") is primarily a specialty chemical manufacturer that develops and markets safe and effective products for agricultural, commercial and consumer uses. The Company manufactures and formulates chemicals for crops, human and animal protection. The consolidated financial statements include the accounts of the Company and its wholly-owned subsidiaries. All significant intercompany accounts and transactions have been eliminated in consolidation. The Company operates within a single operating category.

Based on similar economic and operational characteristics, the Company's business is aggregated into one reportable category. Selective enterprise information is as follows:

	2018	2017	2016
Net sales:			
Insecticides	$150,595	$134,377	$119,226
Herbicides/soil fumigants/fungicides	183,350	124,529	123,540
Other, including plant growth regulators	58,360	42,503	29,438
Total crop	392,305	301,409	272,204
Non-crop	61,967	53,638	39,909
	$454,272	$355,047	$312,113
Gross profit:			
Crop	$150,986	$117,892	$107,821
Non-crop	31,645	29,500	20,467
	$182,631	$147,392	$128,288

Due to elements inherent to the Company's business, such as differing and unpredictable weather patterns, crop growing cycles, changes in product mix of sales and ordering patterns that may vary in timing, measuring the Company's performance on a quarterly basis (for example, gross profit margins on a quarterly basis may vary significantly) even when such comparisons are favorable, is not as good an indicator as full-year comparisons.

Reclassifications—Certain prior years' amounts have been reclassified to conform to the current year's presentation.

Cost of Sales—In addition to normal cost centers (i.e., direct labor, raw materials), the Company also includes such cost centers as Health and Safety, Environmental, Maintenance and Quality Control in cost of sales.

Operating Expenses—Operating expenses include cost centers for Selling, General and Administrative, Research, Product Development, and Regulatory, and Freight, Delivery and Warehousing.

	2018	2017	2016
Selling	$39,585	$29,112	$27,442
General and administrative	42,981	37,660	32,128
Research, product development and regulatory	26,428	26,076	21,298
Freight, delivery and warehousing	34,616	27,750	26,880
	$143,610	$120,598	$107,748

Advertising Expense—The Company expenses advertising costs in the period incurred. Advertising expenses, which include promotional costs, are recognized in operating expenses (specifically in selling expenses) in the consolidated statements of operations and were $4,865, $3,020 and $2,271 in 2018, 2017 and 2016, respectively.

Cash and cash equivalents—The Company's cash equivalents consist primarily of certificates of deposit with an initial term of less than three months. For purposes of the consolidated statements of cash flows, the Company considers all highly liquid debt instruments with original maturities of three months or less to be cash equivalents.

Inventories—The Company values its inventories at lower of cost or net realizable value. Cost is determined by the first-in, first-out ("FIFO") method, including material, labor, factory overhead and subcontracting services. The Company writes down and makes adjustments to its inventory carrying values as a result of net realizable value assessments of slow moving and obsolete inventory and other annual adjustments to ensure that our standard costs continue to closely reflect manufacturing cost. The Company recorded an inventory reserve allowance of $1,989 at December 31, 2018, as compared to $3,137 at December 31, 2017.

The components of inventories, net of reserve allowance, consist of the following:

	2018	2017
Finished products	$147,297	$107,595
Raw materials	12,598	15,529
	$159,895	$123,124

Revenue Recognition—The Company recognizes revenue from the sale of its products, which include insecticides, herbicides, soil fumigants, and fungicides. The Company sells its products to customers, which include distributors and retailers. In addition, the Company recognizes royalty income from the sale of intellectual property. Based on similar economic and operational characteristics, the Company's business is aggregated into one reportable segment. Selective enterprise information of sales disaggregated by category and geographic region is as follows:

	2018	
	As reported	Without adoption of ASC 606
Net sales:		
Crop:		
Insecticides	$150,595	$ 150,638
Herbicides/soil fumigants/fungicides	183,350	183,350
Other, including plant growth regulators and distribution	58,360	58,360
	392,305	392,348
Non-crop, including distribution	61,967	60,467
Total net sales:	$454,272	$ 452,815
Net sales:		
US	$300,314	$ 298,857
International	153,958	153,958
Total net sales:	$454,272	$ 452,815
Timing of revenue recognition:		
Goods transferred at a point in time	$453,449	$ 452,815

Goods and services transferred over time	823	—
Total net sales:	$454,272	$ 452,815

In May 2014, Financial Accounting Standards Board, ("FASB") issued Accounting Standards Update ("ASU") 2014-09, Revenue from Contracts with Customers (Accounting Standards Codification "ASC" 606). ASU 2014-09 outlines a new, single comprehensive model for entities to use in accounting for revenue arising from contracts with customers and supersedes most current revenue recognition guidance, including industry-specific guidance. This new revenue recognition model provides a five-step analysis in determining when and how revenue is recognized. The new model requires revenue recognition to depict the transfer of promised goods or services to customers in an amount that reflects the consideration a company expects to receive in exchange for those goods or services. In March 2016, FASB issued an amendment to the standard, ASU 2016-08, to clarify the implementation guidance on principal versus agent considerations. Under the amendment, an entity is required to determine whether the nature of its promise is to provide the specified good or service itself (that is, the entity is a principal) or to arrange for that good or service to be provided by the other party (that is, the entity is an agent). In April 2016, FASB issued another amendment to the standard, ASU 2016-10, to clarify identifying performance obligations and the licensing implementation guidance, which retaining the related principles for those areas. The standard and the amendments are effective for annual periods beginning after December 15, 2017, and interim periods therein, using either of the following transition methods: (i) a full retrospective approach reflecting the application of the standard in each prior reporting period with the option to elect certain practical expedients, or (ii) a retrospective approach with the cumulative effect of initially adopting ASU 2014-09 recognized at the date of adoption (which includes additional footnote disclosures). These amendments are effective upon adoption of ASC 606. This standard also requires enhanced disclosures regarding the nature, amount, timing, and uncertainty of revenue and cash flows.

Effective January 1, 2018, the Company adopted ASC 606 using the modified retrospective method, therefore, the comparative information has not been adjusted and continues to be reported under ASC 605. The Company determined that for certain products that are deemed to have no alternative use accompanied by an enforceable right to payment for performance completed to date, recognition will change from point in time, to over time. These sales were previously recognized upon delivery, and are now recognized over time utilizing an output method. In addition, the Company earns royalties on certain licenses granted for the use of its intellectual property, which were previously recognized over time. For certain licenses that are considered functional intellectual property, revenue recognition is now at a point in time.

As part of the Company's adoption of ASC 606, the Company elected to use the following practical expedients (i) not to adjust the promised amount of consideration for the effects of a significant financing component when the Company expects, at contract inception, that the period between the Company's transfer of a promised product or service to a customer and when the customer pays for that product or service will be one year or less (ii) allowing entities the option to treat shipping and handling activities that occur after control of the good transfers to the customer as fulfillment activities.

For all of the Company’s sales and distribution channels, revenue is recognized when control of the product is transferred to the customer (i.e., when the Company’s performance obligation is satisfied), which typically occurs at shipment for product sales, but also occurs over time for certain products that are deemed to have no alternative use accompanied by an enforceable right to payment for performance completed to date. For revenue recognized over time, the Company uses an output measure, units produced, to measure progress. From time to time, the Company may offer a program to eligible customers, in good standing, that provides extended payment terms on a portion of the sales on selected products. The Company analyzes these extended payment programs in connection with its revenue recognition policy to ensure all revenue recognition criteria are satisfied at the time of sale.

Performance Obligations—A performance obligation is a promise in a contract or sales order to transfer a distinct good or service to the customer, and is the unit of account in ASC 606. A transaction price is allocated to each distinct performance obligation and recognized as revenue when, or as, the performance obligation is satisfied. Certain of the Company’s sales orders have multiple performance obligations, as the promise to transfer individual goods or services is separately identifiable from other promises in the sales orders. For sales orders with multiple performance obligations, the Company allocates the sales order’s transaction price to each performance obligation based on its relative stand-alone selling price. The stand-alone selling prices are determined based on the prices at which the Company separately sells these products. The Company’s performance obligations are satisfied either at a point in time or over time as work progresses.

At December 31, 2018, the Company had $23,793 of remaining performance obligations, which are comprised of deferred revenue and services not yet delivered. The Company expects to recognize approximately all of its remaining performance obligations as revenue in fiscal 2019.

Contract Balances—The timing of revenue recognition, billings and cash collections may result in deferred revenue in the consolidated balance sheets. The Company sometimes receives payments from its customers in advance of goods and services being provided in return for early cash incentive programs, resulting in deferred revenues. These liabilities are reported on the consolidated balance sheet at the end of each reporting period. The contract assets in the table below are related to royalties earned on certain licenses granted for the use of the Company’s intellectual property, which are recognized at a point in time and remain outstanding as of December 31, 2018.

	December 31, 2018	December 31, 2017
Total receivables, net	$ 134,029	$ 109,605
Contract assets	3,750	—
Deferred revenue	20,043	14,574

Revenue recognized for the year ended December 31, 2018, that was included in the deferred revenue balance at the beginning of 2018 was $14,063.

The following table presents the effect of the adoption of ASC 606 on our consolidated balance sheet as of December 31, 2017:

	As of December 31, 2017		
	As previously reported	Adjustment due to adoption of ASC 606	As adjusted
Total assets	$535,592	$ 3,000	$538,592
Deferred income tax liabilities, net	16,284	786	17,070
Retained earnings	238,953	2,214	241,167

In accordance with ASC 606, the disclosure of the impact of adoption to our consolidated statements of operations for the period ended December 31, 2018 was $43, reductions in net sales. This revenue will move from being recognized at a point in time to be recognized over time.

In accordance with ASC 606, the disclosure of the impact of adoption to our consolidated balance sheets was as follows:

	As of December 31, 2018		
	As reported	Balances without adoption of ASC 606	Impact
Assets:			
Contract assets	$3,750	$ —	$3,750
Current liabilities:			
Deferred revenue	20,043	20,000	43
Income taxes payable	1,168	—	1,168
Stockholders' equity:			
Retained earnings	262,840	259,551	3,289

Revenue Recognition for 2017 and 2016 under ASC 605—Revenues from sales are recognized at the time title and the risks of ownership pass. This is when the customer has made the fixed commitment to purchase the goods, the products are shipped per the customer’s instructions, the sales price is fixed and determinable, and collection is reasonably assured. The Company has in place procedures to ensure that revenues are recognized when earned. The procedures are subject to management’s review and from time to time certain revenues are excluded until it is clear that the title has passed and there is no further recourse to the Company. From time to time, the Company may offer a program to eligible customers, in good standing, that provides extended payment terms on a portion of the sales on selected products. The Company analyzes these extended payment programs in connection with its revenue recognition policy to ensure all revenue recognition criteria are satisfied at the time of sale.

Allowance for Doubtful Accounts—Allowance for doubtful accounts is established based on estimates of losses related to customer receivable balances. Estimates are developed using either standard quantitative measures based on historical losses, adjusted for current economic conditions, or by evaluating specific customer accounts for risk of loss.

Accrued Program Costs— The Company offers various discounts to customers based on the volume purchased within a defined time period, other pricing adjustments, some grower volume incentives or other key performance indicator driven payments made to distributors, retailers or growers, at the end of a growing season. The Company describes these payments as “Programs.” Programs are a critical part of doing business in both the US crop and non-crop chemicals market places. These discount Programs represent variable consideration. In accordance with ASC 606, revenues from sales are recorded at the net sales price, which is the transaction price net of the impact of Programs, and includes estimates of variable consideration. Variable consideration includes amounts expected to be paid to its customers estimated using the expected value method. Each quarter management compares individual sale transactions with Programs to determine what, if any, estimated program liabilities have been incurred. Once this initial calculation is made for the specific quarter, sales and marketing management, along with executive and financial management, review the accumulated Program balance and, for volume driven payments, make assessments of whether or not customers are tracking in a manner that indicates that they will meet the requirements set out in agreed upon terms and conditions attached to each Program. Following this assessment, management will make adjustments to the accumulated accrual to properly reflect the Company’s best estimate of the liability at the balance sheet date. The majority of adjustments are made at, or close to, the end of the crop season, at which time customer performance can be more fully assessed. Programs are paid out predominantly on an annual basis, usually in the final quarter of the financial year or the first quarter of the following year. The Company recorded accrued program costs of $37,349 at December 31, 2018, as compared to $39,054 at December 31, 2017.

Long-lived Assets— Long-lived assets primarily consist of the costs of proprietary returnable packaging assets including SmartBox and Lock and Load containers. The carrying values of long-lived assets are reviewed for impairment quarterly and/or whenever events or changes in circumstances indicate that the carrying value of such assets may not be recoverable. The Company evaluates recoverability of an asset group by comparing the carrying value to the future undiscounted cash flows that it expects to generate from the asset group. If the comparison indicates that the carrying value of an asset group is not recoverable, measurement of the impairment loss is based on the fair value of the asset. There were no circumstances that would indicate any impairment of the carrying value of these long-lived assets and no material impairment losses were recorded in 2018 or 2017.

Property, Plant and Equipment and Depreciation— Property, plant and equipment includes the cost of land, buildings, machinery and equipment, office furniture and fixtures, automobiles, construction projects and significant improvements to existing plant and equipment. Interest costs related to significant construction projects are capitalized at the Company's current weighted average effective interest rate. Expenditures for minor repairs and maintenance are expensed as incurred. When property or equipment is sold or otherwise disposed of, the related cost and accumulated depreciation are removed from the respective accounts and the gain or loss realized on disposition is reflected in operations. All plant and equipment is depreciated using the straight-line method, utilizing the estimated useful property lives. See note 1 for useful lives.

Foreign Currency Translation— Assets and liabilities of foreign subsidiaries, where the local currency is the functional currency, have been translated at period end exchange rates, and profit and loss accounts have been translated using weighted average yearly exchange rates. Adjustments resulting from translation have been recorded in the equity section of the balance sheet as cumulative translation adjustments in other comprehensive income (loss). The effects of foreign currency exchange gains and losses on transactions that are denominated in currencies other than the Company's functional currency, including transactions denominated in the local currencies of the Company's international subsidiaries where the functional currency is the U.S. dollar, are remeasured to the functional currency using the end of the period exchange rates. The effects of remeasurement related to foreign currency transactions are included in operations.

Goodwill and Other Intangible Assets— The primary identifiable intangible assets of the Company relate to assets associated with its product and business acquisitions. Identifiable intangibles with finite lives are amortized and those with indefinite lives are not amortized. The estimated useful life of an identifiable intangible asset to the Company is based upon a number of factors including the effects of demand, competition, and expected changes in the marketability of the Company's products. The Company re-evaluates whether these intangible assets are impaired on both a quarterly and an annual basis and anytime when there is a specific indicator for impairment, relying on a number of factors including operating results, business plans and future cash flows. Identifiable intangible assets that are subject to amortization are evaluated for impairment using a process similar to that used to evaluate long-lived assets. The impairment test for identifiable intangible assets not subject to amortization consists of either a qualitative assessment or a comparison of the fair value of the intangible asset with its carrying amount. An impairment loss, if any, is recognized for the amount by which the carrying value exceeds the fair value of the asset. Fair value is typically estimated using a discounted cash flow analysis. When determining future cash flow estimates, the Company considers historical results adjusted to reflect current and anticipated operating conditions. Estimating future cash flows requires significant judgment by the Company, in such areas as: future economic conditions, industry-specific conditions, product pricing and necessary capital expenditures. The use of different assumptions or estimates for future cash flows could produce different impairment amounts (or none at all) for long-lived assets, goodwill and identifiable intangible assets. The Company performed impairment reviews for the years ended December 31, 2018, 2017 and 2016 and recorded immaterial impairment losses.

The Company reviews goodwill for impairment utilizing either a qualitative assessment or a two-step process. If the Company decides that it is appropriate to perform a qualitative assessment and concludes that the fair value of a

reporting unit more likely than not exceeds its carrying value, no further evaluation is necessary. If the Company performs the two-step process, the first step of the goodwill impairment test is used to identify potential impairment by comparing the fair value of a reporting unit with its carrying amount, including goodwill. If the fair value of a reporting unit exceeds its carrying amount, goodwill of the reporting unit is considered not impaired and the second step of the impairment test is unnecessary. If the carrying amount of a reporting unit exceeds its fair value, the second step is performed to measure the amount of impairment by comparing the carrying amount of the goodwill to a determination of the implied value of the goodwill. If the carrying amount of goodwill is greater than the implied value, an impairment charge is recognized for the difference. The Company annually tests goodwill for impairment in beginning of the fourth quarter. The Company did not record any impairment losses in 2018 or 2017.

Income Taxes—The Company utilizes the liability method of accounting for income taxes as set forth in ASC 740. Under the liability method, deferred taxes are determined based on the temporary differences between the financial statement and tax basis of assets and liabilities using tax rates expected to be in effect during the years in which the basis differences reverse. A valuation allowance is recorded when it is more likely than not that some of the deferred tax assets will not be realized. In determining the need for valuation allowances, the Company considers projected future taxable income and the availability of tax planning strategies. If in the future the Company determines that it would not be able to realize its recorded deferred tax assets, an increase in the valuation allowance would be recorded, decreasing earnings in the period in which such determination is made.

The Company assesses its income tax positions and records tax benefits for all years subject to examination based upon the Company's evaluation of the facts, circumstances and information available at the reporting date. For those tax positions where there is greater than 50% likelihood that a tax benefit will be sustained, the Company has recorded the largest amount of tax benefit that may potentially be realized upon ultimate settlement with a taxing authority that has full knowledge of all relevant information. For those income tax positions where there is less than 50% likelihood that a tax benefit will be sustained, no tax benefit has been recognized in the consolidated financial statements. At December 31, 2018 and 2017, the Company recorded unrecognized tax benefits of $2,170 and $2,118, respectively.

Per Share Information—FASB ASC 260 requires dual presentation of basic earnings per share ("EPS") and diluted EPS on the face of all consolidated statements of operations. Basic EPS is computed as net income divided by the weighted average number of shares of common stock outstanding during the period. Diluted EPS reflects potential dilution to EPS that could occur if securities or other contracts, which, for the Company, consists of restricted stock grants and options to purchase shares of the Company's common stock, are exercised as calculated using the treasury stock method.

The components of basic and diluted earnings per share were as follows:

	2018	2017	2016
Numerator:			
Net income attributable to American Vanguard	$24,195	$20,274	$12,788
Denominator:			
Weighted average shares outstanding—basic	29,326	29,100	28,859
Dilutive effect of stock options and grants	722	603	535
	30,048	29,703	29,394

For the years ended December 31, 2018, 2017, and 2016 no options or grants were excluded from the computation.

Accounting Estimates—The preparation of consolidated financial statements in conformity with accounting principles generally accepted in the United States of America ("U.S. GAAP") requires management to make estimates and assumptions that affect the reported amounts of assets, liabilities (including those related to litigation), and revenues, at the date that the consolidated financial statements are prepared. Significant estimates relate to the allowance for doubtful accounts, inventory reserves, impairment of long-lived assets, accrued program costs, and stock based compensation. Actual results could materially differ from those estimates.

Total comprehensive income—In addition to net income, total comprehensive income includes changes in equity that are excluded from the consolidated statements of operations and are recorded directly into a separate section of stockholders' equity on the consolidated balance sheets. For the years ended December 31, 2018, 2017, and 2016 total comprehensive income consisted of net income attributable to AVD and foreign currency translation adjustments.

Stock-Based Compensation—The Company accounts for stock-based awards to employees and directors pursuant to ASC 718. When applying the provisions of ASC 718, the Company also applies the provisions of Staff Accounting Bulletin ("SAB") No. 107 and SAB No. 110.

ASC 718 requires companies to estimate the fair value of share-based payment awards on the date of grant. The value of the portion of the award that is ultimately expected to vest is recognized as expense over the requisite service periods in the Company's Consolidated Statements of Operations.

Stock-based compensation expense recognized during the period is based on the fair value of the portion of share-based payment awards that is ultimately expected to vest during the period. Stock-based compensation expense recognized is reduced for estimated forfeitures pursuant to ASC 718. Estimated forfeitures recognized in the Company's Consolidated Statements of Operations reduced compensation expense by $358, $177, and $118 for the years ended December 31, 2018, 2017, and 2016, respectively. The Company estimates that 16.2% of all restricted stock grants, 16.1% of the performance based restricted shares and 8.0% of all stock option grants that are currently subject to vesting will be forfeited. These estimates are reviewed quarterly and revised as necessary.

The below tables illustrate the Company's stock based compensation, unamortized stock-based compensation, and remaining weighted average period for the years ended December 31, 2018, 2017 and 2016. This projected expense will change if any stock options and restricted stock are granted or cancelled prior to the respective reporting periods, or if there are any changes required to be made for estimated forfeitures.

	Stock-Based Compensation	Unamortized Stock-Based Compensation	Remaining Weighted Average Period (years)
December 31, 2018			
Restricted Stock	$ 3,657	$ 5,166	1.3
Performance Based Restricted Stock	2,148	2,565	1.9
Total	$ 5,805	$ 7,731	
December 31, 2017			
Incentive Stock Options	$ 345	$ —	—
Performance Based Options	416	—	—
Restricted Stock	2,705	3,788	1.0
Performance Based Restricted Stock	1,248	1,642	1.8
Total	$ 4,714	$ 5,430	
December 31, 2016			
Incentive Stock Options	$ 354	$ 397	1.0
Performance Based Options	188	178	1.0
Restricted Stock	1,630	2,153	1.6
Performance Based Restricted Stock	995	796	1.7
Total	$ 3,167	$ 3,524	

The Company uses the Black-Scholes option-pricing model ("Black-Scholes model") to value option grants using the following weighted average assumptions (i.e. risk free interest rate, dividend yield, volatility and average lives). There were no stock options granted during 2018, 2017 or 2016.

The expected volatility and expected life assumptions are complex and use subjective variables. The variables take into consideration, among other things, actual and projected employee stock option exercise behavior. The Company estimates the expected term or vesting period using the "safe harbor" provisions of SAB 107 and SAB 110. The Company used historical volatility as a proxy for estimating expected volatility.

The Company values restricted stock grants using the Company's traded stock price on the date of grant. The weighted average grant-date fair values of restricted stock grants during 2018, 2017, and 2016 were $20.21, $16.24, and $15.22, respectively.

Recently Issued Accounting Guidance— In February 2018, the Financial Accounting Standards Board (“FASB”) issued Accounting Standards Update (“ASU”) 2018-02, Income Statement-Reporting Comprehensive Income (ASC 220): Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income: The standard permits a reclassification from accumulated other comprehensive income to retained earnings for stranded tax effects resulting from the Tax Cuts and Jobs Act. ASU 2018-02 is effective for the Company’s annual and interim reporting periods beginning December 15, 2018, with early adoption permitted. The Company is currently evaluating the impact of ASU 2018-02; however, at the current time the Company does not expect the adoption of this ASU will have a material impact on its consolidated financial statements.

In January 2018, the FASB released guidance on the accounting for tax on the global intangible low-taxed income (“GILTI”) provisions of the Tax Cuts and Jobs Act (the “Act”). The GILTI provisions imposed a tax on foreign income in excess of a deemed return on tangible assets of foreign corporations. The Company has considered options regarding the accounting treatment for any potential GILTI inclusions and has elected to treat such inclusions as period costs.

In January 2017, the FASB issued ASU 2017-04, Intangibles-Goodwill and Other (ASC 350). The FASB eliminated Step 2 from the goodwill impairment test. In computing the implied fair value of goodwill under Step 2, an entity had to perform procedures to determine the fair value at the impairment testing date of its assets and liabilities (including unrecognized assets and liabilities) following the procedure that would be required in determining the fair value of assets acquired and liabilities assumed in a business combination. Under this update, an entity should perform its goodwill impairment test by comparing the fair value of a reporting unit with its carrying amount. An entity should recognize an impairment charge for the amount the carrying amount exceeds the reporting unit's fair value. This update is effective for fiscal years beginning after December 15, 2019 with early adoption permitted after January 1, 2017. The impact of the new standard will be dependent on the facts and circumstances of future individual impairments, if any.

In January 2017, the FASB issued ASU 2017-01, Business Combinations (ASC 805) that provided guidance on narrowing the definition of a business. The new guidance requires an entity to evaluate if substantially all of the fair value of the gross assets acquired is concentrated in a single identifiable asset or a group of similar identifiable assets; if so, the set of transferred assets and activities is not a business. The guidance also requires a business to include at least one substantive process and narrows the definition of outputs. The Company adopted this new accounting standard on January 1, 2018. Based on the updated definition of a business, the Company concluded that three acquisitions completed in 2018 did not meet the criteria of a business and were therefore accounted for as asset acquisitions rather than business combinations. These three acquisitions would have previously been accounted for as business combinations (see Note 8).

In October 2016, FASB issued ASU 2016-16, Income Taxes (ASC 740). At the time the ASU was issued, US GAAP prohibited the recognition of current and deferred income taxes for an intra-entity asset transfer until the asset has been sold to an outside party. Under the new standard, an entity is to recognize the income tax consequences of an intra-entity transfer of an asset other than inventory when the transfer occurs. The new standard does not include new disclosure requirements; however, existing disclosure requirements might be applicable when accounting for the current and deferred income taxes for an intra-entity transfer of an asset other than inventory. The new standard is effective for annual periods beginning after December 15, 2017, including interim reporting periods within those annual periods. The Company adopted ASU 2016-16 as of January 1, 2018 and recorded a reduction of $180 to retained earnings.

In August 2016, FASB issued ASU 2016-15, Statement of Cash Flows (ASC 230). The new standard addresses eight specific classification issues within the current practice regarding the manner in which certain cash receipts and cash payments are presented. The new standard is effective for fiscal years beginning after December 15, 2017, with early adoption permitted. The Company adopted the standard for the year beginning January 1, 2018. There was no material impact on the Company's consolidated statements of cash flows for the year ended December 31, 2018 and the Company does not expect any material impact going forward.

In February 2016, the FASB established Topic 842, Leases, by issuing Accounting Standards Update (ASU) No. 2016-02, which requires lessees to recognize leases with terms longer than 12 months on the balance sheet and disclose key information about leasing arrangements. Leases will be classified as either finance or operating, with classification affecting the pattern of expense recognition in the income statement. The classification criteria for distinguishing between operating and finance (previously capital) leases are substantially similar to the previous lease guidance, but with no explicit bright lines.

The Company adopted the standard as of January 1, 2019, electing the transition method that allows us to apply the standard as of the adoption date and record a cumulative adjustment in retained earnings, if applicable. We elected to apply all relevant practical expedients permitted under the transition guidance within the new lease standard with the exception of the practical expedient allowing the use of hindsight in determining the lease term and in assessing impairment. The new standard also provides practical expedients for an entity's ongoing accounting. We have elected an accounting policy election to keep leases with an initial term of 12 months or less off the balance sheet and recognize those lease payments in the consolidated statements of income on a straight-line basis over the lease term. We have also elected the practical expedient to not separate lease and non-lease components for all of our leases as the non-lease components are not significant to the overall lease costs.

The Company has nearly completed evaluating the impact that the adoption of this standard will have on its consolidated financial statements and anticipates that the adoption of this standard will result in the recognition of net lease assets and lease liabilities of approximately 2.5 % of its total assets on the consolidated balance sheets as of January 1, 2019. The Company does not expect that the adoption of this standard will have a material impact on the consolidated statement of operations and comprehensive income and loss or in the statement of cash flows.

In January 2016, the FASB issued ASU 2016-01, "Financial Instruments - Overall (Subtopic 825-10): Recognition and Measurement of Financial Assets and Financial Liabilities." The amendment requires (i) equity investments (except those accounted for under the equity method of accounting, or those that result in consolidation of the investee) to be measured at fair value with changes in fair value recognized in net income, (ii) public business entities to use the exit price notion when measuring the fair value of financial instruments for disclosure purposes and (iii) separate presentation of financial assets and financial liabilities by measurement category and form of financial asset (i.e., securities or loans and receivables). This amendment eliminates the requirement for public business entities to disclose the method(s) and significant assumptions used to estimate the fair value that is required to be disclosed for financial instruments measured at amortized cost. The Company adopted the provisions of ASU 2016-01 on January 1, 2018 and has elected to measure its cost method investment without a readily determinable fair value at its cost minus impairment, if any, plus or minus changes resulting from observable price changes in orderly transactions for the identical or a similar investment of the same issuer. There were no observable price changes during the year ended December 31, 2018. The adoption of this standard did not have a material impact on the Company’s consolidated financial statements.

(1) Property, Plant and Equipment

Property, plant and equipment at December 31, 2018 and 2017 consist of the following:

	2018	2017	Estimated useful lives
Land	$2,548	$2,458	
Buildings and improvements	17,555	16,678	10 to 30 years
Machinery and equipment	109,064	107,722	3 to 15 years
Office furniture, fixtures and equipment	5,655	4,925	3 to 10 years
Automotive equipment	1,116	735	3 to 6 years
Construction in progress	2,513	1,917	
Total gross value	138,451	134,435	
Less accumulated depreciation	(89,199)	(85,114)	
Total net value	$49,252	$49,321	

For the years ended December 31, 2018, 2017, and 2016, the Company’s aggregate depreciation expense related to property and equipment was $8,142, $8,154, and $8,307, respectively. For the years ended December 31, 2018, 2017, and 2016, the Company eliminated from assets and accumulated depreciation $4,057, $6,317 and $16,652 of fully depreciated assets, respectively.

(2) Long-Term Debt

Long-term debt of the Company at December 31, 2018 and 2017 is summarized as follows:

	2018	2017
Revolving line of credit	$97,400	$78,425
Less debt issuance costs	(729)	(939)

	$96,671	$77,486

Principal payments on long-term debt at December 31, 2018 of $97,400 are due in 2022.

As of June 30, 2017, AMVAC, the Company's principal operating subsidiary, as borrower, and affiliates (including the Company, AMVAC CV and AMVAC BV), as guarantors and/or borrowers, entered into a Third Amendment to Second Amended and Restated Credit Agreement (the "Credit Agreement") with a group of commercial lenders led by Bank of the West (AMVAC's primary bank) as agent, swing line lender and Letter of Credit ("L/C") issuer. The Credit Agreement is a senior secured lending facility, consisting of a line of credit of up to $250,000, an accordion feature of up to $100,000 and a maturity date of June 30, 2022. The Credit Agreement contains two key financial covenants; namely, borrowers are required to maintain a Consolidated Funded Debt Ratio of no more than 3.25-to-1 and a Consolidated Fixed Charge Covenant Ratio of at least 1.25-to-1. The Company's borrowing capacity varies with its financial performance, measured in terms of EBITDA, for the trailing twelve-month period. Under the Credit Agreement, revolving loans bear interest at a variable rate based, at borrower's election with proper notice, on either (i) LIBOR plus the "Applicable Rate" which is based upon the Consolidated Funded Debt Ratio ("Eurocurrency Rate Loan") or (ii) the greater of (x) the Prime Rate, (y) the Federal Funds Rate plus 0.5%, and (z) the Daily One-Month LIBOR Rate plus 1.00%, plus, in the case of (x), (y) or (z) the Applicable Rate ("Alternate Base Rate Loan"). Interest payments for Eurocurrency Rate Loans are payable on the last day of each interest period (either one, two, three or six months, as selected by the borrower) and the maturity date, while interest payments for Alternate Base Rate Loans are payable on the last business day of each month and the maturity date.

At December 31, 2018, according to the terms of the Credit Agreement and based on our performance against the most restrictive covenants listed above, the Company had the capacity to increase its borrowings by up to $112,150. This compares to an available borrowing capacity of $139,241 as of December 31, 2017. The level of borrowing capacity is driven by three factors: (1) our financial performance, as measured in EBITDA for trailing twelve-month period (2) the inclusion of proforma EBITDA related to acquisitions completed during the preceding twelve months and (3) the leverage covenant (being the number of times EBITDA the Company may borrow under its credit facility agreement).

Substantially all of the Company's assets are pledged as collateral under the Credit Agreement. The Company was in compliance with all its debt covenants as of December 31, 2018.

The Company has various loans in place that together constitute the loan balances shown in the consolidated balance sheets at December 31, 2018 and December 31, 2017. The average amount outstanding on the senior secured revolving line of credit during the years ended December 31, 2018 and 2017 was $93,346 and $51,103, respectively. The weighted average interest rate on the revolving credit line during the years ended December 31, 2018, 2017, and 2016 was 3.6%, 3.0%, and 2.3% respectively.

(3) Income Taxes

On December 22, 2017, the Tax Cuts and Jobs Act (the "Tax Reform Act") was signed into law. The legislation significantly changes U.S. tax law by, among other things, lowering corporate income tax rate, implementing a territorial tax system and imposing a repatriation tax on deemed repatriated earnings of foreign subsidiaries. The Tax Reform Act reduces the U.S. corporate income tax rate from a maximum of 35% to a flat 21% rate, effective January 1, 2018. The SEC staff issued Staff Accounting Bulletin No. 118 ("SAB 118") to address the application of U.S. GAAP in situations when a registrant does not have the necessary information available, prepared, or analyzed (including computations) in reasonable detail to complete the accounting for certain income tax effects of the Tax Reform Act. A company may select between one of three scenarios to determine a reasonable estimate arising from the Tax Reform Act. Those scenarios are (i) a final estimate which effectively closes the measurement window; (ii) a reasonable estimate leaving the measurement window open for future revisions; and (iii) no estimate as the law is still being analyzed. The Company made a reasonable estimate for the revaluation of deferred taxes and the effects of the

repatriation undistributed foreign subsidiary earnings and profits. As a result of the reduction in the U.S. corporate income tax rate from 35% to 21% under the Tax Reform Act, the Company revalued its net deferred tax liabilities at December 31, 2017, resulting in a $4,683 benefit included in the provision for income taxes for the year ended December 31, 2017. The Tax Reform Act also provided for a one-time deemed mandatory repatriation of Post-1986 E&P through the year ended December 31, 2017. As a result, the Company recognized a provisional $1,250 charge in the provision for income taxes for the year ended December 31, 2017 related to the deemed mandatory repatriation. During 2018, additional work including a more detailed analysis of the Company's deferred tax assets and liabilities and its historical foreign earnings as well as potential correlative adjustments were completed. In this regard, the Company recorded a one-time $1,089 charge in the provision for income taxes for the year ended December 31, 2018.

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The provisions for income taxes are:

	2018	2017	2016
Current:			
Federal	$5,641	$2,124	$5,136
State	1,777	1,347	(122)
Foreign	2,121	570	655
Deferred:			
Federal	650	160	(1,345)
State	(365)	242	1,216
Foreign	(679)	—	—
	$9,145	$4,443	$5,540

Total income tax expense differed from the amounts computed by applying the U.S. Federal income tax rate of 21.0% to income before income tax expense as a result of the following:

	2018	2017	2016
Computed tax expense at statutory federal rates	$7,054	$8,651	$6,415
Increase (decrease) in taxes resulting from:			
State taxes, net of federal income tax benefit	1,627	988	820
Domestic production deduction	—	(150)	(1,272)
Impact of the enactment of the Tax Cuts and Jobs Act (net)	1,089	(3,433)	—
Income tax credits	(689)	(431)	(335)
Foreign tax rate differential	(37)	(1,503)	(1,587)
Subpart F income	14	3	14
(Gain) loss on equity investments	(61)	62	123
Stock based compensation	277	262	208
Tax interest	—	(22)	920
Other	(129)	16	234
	$9,145	$4,443	$5,540

Income before provision for income taxes and losses on equity investments are:

	2018	2017	2016
Domestic	$26,124	$18,931	$12,513
Foreign	7,472	5,922	6,404
	$33,596	$24,853	$18,917

Temporary differences between the financial statement carrying amounts and tax bases of assets and liabilities that give rise to significant portions of the net deferred tax liability at December 31, 2018 and 2017 relate to the following:

	2018	2017
Deferred tax asset		
Inventories	$3,299	$3,213
State income taxes	53	330
Program accrual	7,088	7,381
Vacation pay accrual	685	600
Accrued bonuses	1,246	1,073
Bad debt expense	294	12
Stock compensation	1,723	822
NOL carryforward	580	54
Tax credits	779	778
Other	266	381
Deferred tax asset	$16,013	$14,644
Deferred tax liability		
Plant and equipment, principally due to differences in depreciation and capitalized interest	$30,269	$29,986
Prepaid expenses	1,107	942
Deferred tax liability	31,376	30,928
Total net deferred tax liability	$15,363	$16,284

The following is a roll-forward of the Company's total gross unrecognized tax liabilities, not including interest and penalties, for the years ended December 31, 2018 and 2017:

	2018	2017
Balance at beginning of year	$2,118	$1,893
Additions for tax positions related to the current year	128	77
Additions for tax positions related to the prior years	24	—
Additions for tax positions related to acquired businesses	—	1,766
Reduction for tax positions related to the prior years	(100)	(1,618)
Balance at end of year	$2,170	$2,118

The Company recognizes accrued interest and penalties related to unrecognized tax benefits in the provision for income taxes in the Company's consolidated financial statements. For the years ended December 31, 2018, 2017, and 2016 the Company had recognized approximately $2,368, $2,257, and $408 respectively in interest and penalties related to unrecognized tax benefits.

It is expected that the amount of unrecognized tax benefits will change within the next twelve months; however we do not expect the change to have a significant impact on our consolidated financial statements. At this time, an estimate of the range of the reasonable possible outcomes cannot be made.

The Company believes it is more likely than not that the deferred tax assets detailed in the table above will be realized in the normal course of business. It is the intent of the Company that undistributed earnings of foreign subsidiaries are permanently reinvested. The amount of undistributed earnings was $4,297 as of December 31, 2018. Upon distribution of earnings in the form of dividends or otherwise, the Company may still be subject to state income taxes and withholding taxes payable to the various foreign countries. Determination of the unrecognized deferred tax liability is not practical due to the complexities of a hypothetical calculation.

The Company is subject to U.S. federal income tax as well as to income tax in multiple state jurisdictions. Federal income tax returns of the Company are subject to International Revenue (“IRS”) examination for the 2015 through 2017 tax years. State income tax returns are subject to examination for the 2014 through 2017 tax years. The Company has other foreign income tax returns subject to examination.

(4) Litigation and Environmental

A. DBCP Cases

Over the course of the past 30 years, AMVAC and/or the Company have been named or otherwise implicated in a number of lawsuits concerning injuries allegedly arising from either contamination of water supplies or personal exposure to 1, 2-dibromo-3-chloropropane ("DBCP®"). DBCP was manufactured by several chemical companies, including Dow Chemical Company, Shell Oil Company and AVD and was approved by the USEPA to control nematodes. DBCP was also applied on banana farms in Latin America. The USEPA suspended registrations of DBCP in October 1979, except for use on pineapples in Hawaii. That suspension was partially based on 1977 studies by other manufacturers that indicated a possible link between male fertility and exposure to DBCP among their factory production workers involved with producing it.

At present, there are three domestic lawsuits and approximately 85 Nicaraguan lawsuits filed by former banana workers in which AMVAC has been named as a party. Only two of the Nicaraguan actions have actually been served on AMVAC. With respect to Nicaraguan matters, there was no change in status during 2018. As described more fully below, activity in domestic cases during 2018 is as follows. The one case remaining in Delaware includes 57 plaintiffs who have appealed a lower court finding that the matter was barred by the statute of limitations; this matter has been remanded to the trial court, following a ruling by the Delaware Supreme Court on recognizing the doctrine of cross-jurisdictional tolling. In Hawaii, in the matter of Patrickson, et. al. v. Dole Food Company, the parties have stipulated that the Company shall be dismissed, insofar as it was not a party to the class action case that tolled the statute of limitations. In Adams (also in Hawai'i), there has been no activity since 2014, when the court granted dismissal of co-defendant Dole on the basis of a worker's compensation bar and gave plaintiffs leave to amend their complaint in light of that ruling. Finally, plaintiffs in Chaverri, which had been dismissed by the Superior Court of the State of Delaware in 2012 for failure to meet the applicable statute of limitations, have brought a motion to vacate the dismissal on the ground that the matter should be subject to trial on the merits under the principle of cross-jurisdictional tolling.

Nicaraguan Matters

A review of court filings in Chinandega, Nicaragua, has found 85 suits alleging personal injury allegedly due to exposure to DBCP and involving approximately 3,592 plaintiffs have been filed against AMVAC and other parties. Of these cases, only two – Flavio Apolinar Castillo et al. v. AMVAC et al., No. 535/04 and Luis Cristobal Martinez Suazo et al. v. AMVAC et al., No. 679/04 (which were filed in 2004 and involve 15 banana workers) – have been served on AMVAC. All but one of the suits in Nicaragua have been filed pursuant to Special Law 364, an October 2000 Nicaraguan statute that contains substantive and procedural provisions that Nicaragua's Attorney General previously expressed as unconstitutional. Each of the Nicaraguan plaintiffs' claims $1,000 in compensatory damages and $5,000 in punitive damages. In all of these cases, AMVAC is a joint defendant with Dow Chemical Company and Dole Food Company, Inc. AMVAC contends that the Nicaragua courts do not have jurisdiction over it and that Public Law 364 violates international due process of law. AMVAC has objected to personal jurisdiction and demanded under Law 364 that the claims be litigated in the United States. In 2007, the court denied these objections, and AMVAC appealed the denial. It is not presently known as to how many of these plaintiffs actually claim exposure to DBCP at the time AMVAC's product was allegedly used nor is there any verification of the claimed injuries. Further, to date, plaintiffs have not had success in enforcing Nicaraguan judgments against domestic companies before U.S. courts. With respect to these Nicaraguan matters, AMVAC intends to defend any claim vigorously. Furthermore, the Company does not believe that a loss is either probable or reasonably estimable and has not recorded a loss contingency for these matters.

Delaware DBCP Cases

Abad Castillo and Marquinez. On or about May 31, 2012, two cases (captioned Abad Castillo and Marquinez) were filed with the United States District Court for the District of Delaware (USDC DE No. 1:12-CV-00695-LPS) involving claims for physical injury arising from alleged exposure to DBCP over the course of the late 1960's through the mid-1980's on behalf of 2,700 banana plantation workers from Costa Rica, Ecuador, Guatemala, and Panama. Defendant Dole brought a motion to dismiss 22 plaintiffs from Abad Castillo on the ground that they were parties in cases that had been filed by HendlerLaw, P.C. in Louisiana. On September 19, 2013, the appeals court granted, in part, and denied, in part, the motion to dismiss, holding that 14 of the 22 plaintiffs should be dismissed. On May 27, 2014, the district court granted Dole's motion to dismiss the matter without prejudice on the ground that the applicable statute of limitations had expired in 1995. Then, on August 5, 2014, the parties stipulated to summary judgment in favor of defendants (on the same ground as the earlier motion) and the court entered judgment in the matter. Plaintiffs were given an opportunity to appeal; however, only 57 of the 2,700 actually entered an appeal. Thus, only 57 plaintiffs remain in the action. On or about June 18, 2017, the Third Circuit Court submitted a certified question of law to the Delaware Supreme Court on the question of when the tolling period ended. The Delaware Supreme Court heard oral argument on January 17, 2018 and, on March 15, 2018 ruled on the matter, finding that federal court dismissal in 1995 on the grounds of forum non conveniens did not end class action tolling, and that such tolling ended when class action certification was denied in Texas state court in June 2010. This matter is now at the district court, following the appeals court's receipt of the ruling. Discovery has commenced. The Company believes that a loss is neither probable nor reasonably estimable in this matter and has not recorded a loss contingency.

Chaverri. This matter involves 258 plantation workers from Costa Rica, Ecuador and Panama alleging physical injury from DBCP in the late 1970's, was originally filed in the state of Texas in 1993, then underwent a tortuous series of law and motion developments until it was ultimately refiled in May 2012 by the Hendler firm in the Superior Court of the State of Delaware as Chaverri et al. v. Dole Food Company, Inc. et al. (including AMVAC) (N12C-06-017 ALR), where it was subsequently dismissed with prejudice in August 2012 under the statute of limitations. In light of the Delaware Supreme Court's adoption of cross-jurisdictional tolling, however, in January 2019, plaintiffs filed a motion to vacate the dismissal, arguing that the matter had been dismissed on a basis, which the Delaware Supreme Court no longer recognizes without ever having been adjudicated as to the merits. Defendants are filing briefs in opposition to this motion. The Company believes that a loss is neither probable nor reasonably estimable and has not recorded a loss contingency.

Hawaiian DBCP Matters

Patrickson, et. al. v. Dole Food Company, et al. In October 1997, AMVAC was served with two complaints in which it was named as a defendant, filed in the Circuit Court, First Circuit, State of Hawai'i and in the Circuit Court of the Second Circuit, State of Hawai'i (two identical suits) entitled Patrickson, et. al. v. Dole Food Company, et. al ("Patrickson Case") alleging damages sustained from injuries (including sterility) to banana workers caused by plaintiffs' exposure to DBCP while applying the product in their native countries. Other named defendants include: Dole Food Company, Shell Oil Company and Dow Chemical Company. After several years of law and motion activity, the court granted judgment in favor of the defendants based upon the statute of limitations on July 28, 2010. On August 24, 2010, the plaintiffs filed a notice of appeal. On April 8, 2011, counsel for plaintiffs filed a pleading to withdraw and to substitute new counsel. On October 21, 2015, the Hawai'i Supreme Court granted the appeal and overturned the lower court decision, ruling that the State of Hawai'i now recognizes cross-jurisdictional tolling (that is, the principle under which the courts of one state recognize another state's common law on the tolling of statutes of limitation), that plaintiffs filed their complaint within the applicable statute of limitations and that the matter is to be remanded to the lower court for further adjudication. However, in November 2018, the parties stipulated that, because it was not named as a defendant in the Carcamo matter (class action matter that gave rise to the tolling of the statute of limitations), AMVAC should be dismissed from this matter. Thus, we expect that the Company will be dismissed with

prejudice from this action as soon as the court issues an order.

Adams v. Dole Food Company et al. On approximately November 23, 2007, AMVAC was served with a suit filed by two former Hawaiian pineapple workers (and their spouses), alleging that they had testicular cancer due to DBCP exposure; the action is captioned Adams v. Dole Food Company et al in the First Circuit for the State of Hawaii. Plaintiff alleges that they were exposed to DBCP between 1971 and 1975. AMVAC denies that any of its product could have been used at the times and locations alleged by these plaintiffs. Following the dismissal of Dole Food Company on the basis of the exclusive remedy of worker's compensation benefits, plaintiffs appealed the dismissal. The court of appeals subsequently remanded the matter to the lower court in February 2014, effectively permitting plaintiffs to amend their complaint to circumvent the workers' compensation bar. There has been no activity in the case since that time, and the Company does not believe that a loss is either probable or reasonably estimable and has not recorded a loss contingency for this matter.

B. Other Matters

EPA FIFRA/RCRA Matter. On November 10, 2016, the Company was served with a grand jury subpoena out of the U.S. District Court for the Southern District of Alabama in which the U.S. Department of Justice ("DoJ") sought production of documents relating to the Company's reimportation of depleted Thimet containers from Canada and Australia. The Company retained defense counsel and completed production of documents. During the fourth quarter of 2018, government attorneys interviewed four individuals who may be knowledgeable of the matter. At this stage, DoJ has not made clear its intentions with regard to either its theory of the case or potential criminal enforcement. Thus, it is too early to tell whether a loss is probable or reasonably estimable. Accordingly, the Company has not recorded a loss contingency on this matter.

Harold Reed v. AMVAC et al. During January 2017, the Company was served with two Statements of Claim that had been filed on March 29, 2016 with the Court of Queen's Bench of Alberta, Canada (as case numbers 160600211 and 160600237) in which plaintiffs Harold Reed (an applicator) and 819596 Alberta Ltd. dba Jem Holdings (an application equipment rental company) allege physical injury and damage to equipment, respectively, arising from a fire that occurred during an application of the Company's potato sprout inhibitor, SmartBlock, at a potato storage facility in Coaldale, Alberta on April 2, 2014. Plaintiffs allege, among other things, that AMVAC was negligent and failed to warn them of the risks of such application. Reed seeks damages of $250 for pain and suffering, while Jem Holdings seeks $60 in lost equipment; both plaintiffs also seek unspecified damages as well. Also during January 2017, the Company received notice that four related actions relating to the same incident were filed with the same court: (i) Van Giessen Growers, Inc. v Harold Reed et al (No. 160303906)(in which grower seeks $400 for loss of potatoes); (ii) James Houweling et al. v. Harold Reed et al. (No. 160104421)(in which equipment owner seeks damages for lost equipment); (iii) Chin Coulee Farms, etc. v. Harold Reed et al. (No. 150600545)(in which owner of potatoes and truck seeks $530 for loss thereof); and (iv) Houweling Farms v. Harold Reed et al. (No. 15060881)(in which owner of several Quonset huts seeks damages for lost improvements, equipment and business income equal to $4,300). The Company was subsequently named as cross-defendant in those actions by Reed. During the third quarter of 2017, counsel for the Company filed a Statement of Defence (the Canadian equivalent of an answer), alleging that Reed was negligent in his application of the product and that the other cross-defendants were negligent for using highly flammable insulation and failing to maintain sparking electrical fixtures in the storage units affected by the fire. The Company believes that the claims against it in these matters are without merit and intends to defend them vigorously. At this stage in the proceedings, however, it is too early to determine whether a loss is probable or reasonably estimable; accordingly, the Company has not recorded a loss contingency.

Takings Case. On June 14, 2016, the Company filed a lawsuit against the USEPA in the U.S. Court of Federal Claims, entitled "American Vanguard Corporation v. USEPA" (Case No. 16-694C) under which the Company claimed damages from USEPA on the ground that that agency's issuance of a Stop Sale, Use and Removal Order against the PCNB product line in August 2010 amounts to a taking without just compensation under the Tucker Act. The court in this matter denied the government's motion to dismiss for lack of jurisdiction and failure to state a claim, which was brought in September 2016. Fact and expert discovery was completed, and both parties filed motions for summary judgment on the merits. In January 2019, the court denied the Company's motion for summary judgment, while granting that of the government, finding that the Company's PCNB business did not amount to a cognizable property interest in the context of the Tucker Act. The Company will be filing a motion for reconsideration on the ground that the court's decision was based upon an erroneous understanding of the facts. Since any recovery in this matter is contingent upon judgment, and there is no assurance of receiving a favorable judgment, the Company has not recorded any amount in its consolidated financial statements.

(5) Employee Deferred Compensation Plan and Employee Stock Purchase Plan

The Company maintains a deferred compensation plan (“the Plan”) for all eligible employees. The Plan calls for each eligible employee, at the employee’s election, to participate in an income deferral arrangement under Internal Revenue Code Section 401(k). The plan allows eligible employees to make contributions which cannot exceed 100% of compensation, or the annual dollar limit set by the Internal Revenue Code. The Company matches the first 5% of employee contributions. The Company’s contributions to the Plan amounted to $1,914, $1,550 and $1,258 in 2018, 2017 and 2016, respectively.

During 2001, the Company's Board of Directors adopted the AVD Employee Stock Purchase Plan (the "ESPP Plan"). The Plan allows eligible employees to purchase shares of common stock through payroll deductions at a discounted price. An original aggregate number of approximately 1,000,000 shares of the Company's Common Stock, par value $0.10 per share (subject to adjustment for any stock dividend, stock split or other relevant changes in the Company's capitalization) were allowed to be sold pursuant to the Plan, which is intended to qualify under Section 423 of the Internal Revenue Code. The Plan allows for purchases in a series of offering periods, each six months in duration, with new offering periods (other than the initial offering period) commencing on January 1 and July 1 of each year. The initial offering period commenced on July 1, 2001. Pursuant to action taken by the Company's Board of Directors in December 10, 2010, the expiration of the Plan was extended to December 31, 2013. The Plan was amended and restated on June 30, 2011 following stockholders' ratification of the extended expiration date. The Plan was amended as of June 6, 2018 following stockholders' ratification of a ten year extension to the expiration date (which now stands at December 31, 2028). Under the Plan, as amended as of June 6, 2018, 995,000 shares of the Company's common stock were authorized. As of December 31, 2018, 2017, and 2016, 690,859, 726,809, and 760,825 shares, respectively, remained available under the plan. The expense recognized under the Plan was immaterial during the years ended December 31, 2018, 2017 and 2016, respectively.

Shares of common stock purchased through the Plan in 2018, 2017 and 2016 were 35,950, 34,016 and 42,730, respectively.

(6) Major Customers and International Sales

In 2018, there were three companies that accounted for 12%, 9% and 8%, respectively, of the Company's consolidated sales. In 2017, there were three companies that accounted for 13%, 10%, and 10% of the Company's consolidated sales. In 2016, there were three companies that accounted for 15%, 11% and 8% of the Company's consolidated sales.

The Company primarily sells its products to large distributors, buying cooperatives and groups and extends credit based on an evaluation of the customer's financial condition. The Company had three significant customers who each accounted for approximately 8%, 7% and 5% of the Company's receivables as of December 31, 2018. The Company had three significant customers who each accounted for approximately 10%, 9% and 8% of the Company's receivables as of December 31, 2017. The Company has long-standing relationships with its customers and the Company considers its overall credit risk for accounts receivables to be low.

International sales for 2018, 2017 and 2016 were as follows:

	2018	2017	2016
Asia	$14,828	$28,880	$17,138
South and Central America	86,172	25,748	16,234
Mexico	24,578	16,030	16,690
Europe	11,059	10,700	14,519
Africa	8,027	7,893	7,111
Australia	2,635	4,334	3,735
Canada	3,403	4,083	3,690
Middle East	3,256	1,237	4,041
Other	—	—	101
	$153,958	$98,905	$83,259

(7) Royalties

The Company has two licensing agreements that require minimum annual royalty payments. Those agreements related to the acquisition of certain products. The Company also has two other licensing arrangements in which royalty are paid based on percentage of annual sales. Certain royalty agreements contain confidentiality covenants. Royalty expenses were $86, $81 and $83 for 2018, 2017 and 2016, respectively.

(8) Product and Business Acquisitions

During the year ended December 31, 2018, the Company completed four acquisitions in exchange for a total cash consideration at closing of $19,851, net of cash acquired ($1,600), cash consideration paid in January 2019 ($3,530) and the fair value of the Company's pre-existing ownership position ($2,044). In addition, the Company assumed liabilities of $1,750 and capitalized costs of $108 incurred in the asset acquisition process. The total value of $27,283 has been preliminarily allocated as follows: product registrations and product rights $12,720, trade names, trademarks and patents $2,934, customer lists $739, goodwill $3,954, inventory $5,461, other working capital $122 and property, plant and equipment $27, and deferred tax assets $1,326.

The acquisition of TyraTech Inc. (TyraTech) was accounted for as a business combination. The Company acquired 65.62% of TyraTech's issued and outstanding shares on November 8, 2018 in exchange for cash consideration of $2,154 at closing and liabilities assumed of $1,750. Together with the Company's pre-existing ownership of 34.38% with a fair value of $2,044, TyraTech became a wholly-owned subsidiary of the Company and was delisted from the AIM market of the London Stock Exchange. TyraTech is a life sciences company focused on nature-derived insect and parasite control products. Their patented technology platform leverages synergistic essential oil combination to target invertebrate pest receptors that are not active in humans and other mammals. The assessment of the purchase price allocation related to the business combination is preliminary as at December 31, 2018 and will be completed during 2019. The preliminary purchase price allocation is based on information available to management and is as follows: working capital of $205, intangible assets of $436 and goodwill of $3,954, property, plant and equipment of $27, and deferred tax assets of $1,326. Goodwill is not expected to be deductible for income tax purposes. The preliminary fair value allocation is subject to change, which may be significant. The goodwill consists largely of acquired workforce and tax related matters. As a result of this acquisition, the Company was required to step up the value of its ownership and recorded a gain of $1,463. The acquired business was included in the Company's consolidated financial statements from the date of acquisition.

Three of the acquisitions mentioned previously related to product lines, acquired from E.I DuPont et Nemours and Company (one) and Bayer CropScience (two), were purchased for total cash consideration at closing of $21,335, including transaction costs of $108, and $3,530 paid in January 2019. These acquisitions were accounted for as asset acquisitions because the Company did not acquire any substantive processes. Of this amount, $5,378 was recorded to inventory and the remaining to intangibles. One of the asset acquisitions includes contingent consideration in the form of potential milestone payments that could amount to a maximum additional payment of $12,500. These milestone payments will be recorded as additional acquisition costs upon the point in time the milestone criteria are met, if applicable. The purchase price allocation was completed as at December 31, 2018 and the acquired product lines were included in the Company's consolidated financial statements from the date of acquisition.

Cash paid at closing for the asset acquisitions and business combination was funded through our revolving line of credit. The Company considers that the acquisitions completed during 2018 are immaterial individually and in the aggregate to the accompanying consolidated financial statements, and accordingly pro-forma financial information is not included.

During the year ended December 31, 2017, the Company completed acquisitions with a total combined purchase consideration, net of cash acquired, of $92,555 including cash paid at closing in the amount of $81,896 and deferred consideration of $10,659. At closing the Company recorded $12,814 related to tax matters associated with the acquisitions. At December 31, 2017 the purchase price was provisionally allocated as follows: product registrations and product rights $55,127, trade names and trademarks $9,500, customer relationships and customer lists $3,700, goodwill $22,184, working capital $14,679 and property, plant and equipment $512. The purchase price allocation was finalized during 2018, which resulted in a reduction in goodwill of $348.

The following unaudited pro forma information presents a summary of the Company's combined results of operations for the years ended December 31, 2017, as if the 2017 business acquisitions had occurred on January 1, 2017. The following pro forma financial information is not necessarily indicative of the results of operations as they would have been had the transaction been effected on the assumed date, nor is it necessarily an indication of trends in future results for a number of reasons. Consequently, actual results will differ from the unaudited pro forma financial information.

	Year ended

	December 31, 2017
Pro forma net sales	$ 458,793
Pro forma net income	24,540
Pro forma earnings per common share – basic	0.84
Pro forma earnings per common share – assuming dilution	0.83

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(9) Intangible Assets and Goodwill

The following schedule represents intangible assets recognized in connection with product acquisitions (See description of Business, Basis of Consolidation and Significant Accounting Policies for the Company's accounting policy regarding intangible assets):

	Amount
Intangible assets at December 31, 2015	$129,160
Additions during fiscal 2016	224
Write offs during fiscal 2016	(78)
Impact of movement in exchange rates	69
Amortization expense	(7,942)
Intangible assets at December 31, 2016	121,433
Additions during fiscal 2017	68,327
Impact of movement in exchange rates	(6)
Amortization expense	(8,804)
Intangible assets at December 31, 2017	180,950
Additions during fiscal 2018	16,429
Impact of movement in exchange rates	(45)
Amortization expense	(10,751)
Intangible assets at December 31, 2018	$186,583
Goodwill at December 31, 2017	$22,184
Net additions during fiscal 2018	3,606
Goodwill at December 31, 2018	$25,790
Intangible assets and goodwill at December 31, 2018	$212,373

The following schedule represents the gross carrying amount and accumulated amortization of intangible assets and goodwill. Product rights and trademarks are amortized over their expected useful lives of 25 years. Customer lists are amortized over their expected useful lives of ten years.

	2018			2017		
		Accumulated	Net Book		Accumulated	Net Book
$000's	Gross	Amortization	Value	Gross	Amortization	Value
Product Rights	$235,684	$ 79,627	$156,057	$223,022	$ 70,701	$152,321
Trademarks	30,483	5,337	25,146	27,541	4,233	23,308
Customer Lists	7,529	2,149	5,380	6,791	1,470	5,321
Total intangibles assets	273,696	87,113	186,583	257,354	76,404	180,950
Goodwill	25,790	—	25,790	22,184	—	22,184
Total intangibles and goodwill	$299,486	$ 87,113	$212,373	$279,538	$ 76,404	$203,134

The following schedule represents future amortization charges related to intangible assets:

Year ending December 31,	
2019	$12,822
2020	12,822
2021	12,713
2022	12,592
2023	11,972
Thereafter	123,662
	$186,583

The following schedule represents the Company's obligations under acquisitions and licensing agreements:

	Amount
Obligations under acquisition agreements at December 31, 2015	$1,535
Additional obligations acquired	224
Adjustment to deferred liabilities	(22)
Amortization of discounted liabilities	38
Payments on existing obligations	(960)
Obligations under acquisition agreements at December 31, 2016	815
Additional obligations acquired	10,659
Adjustment to deferred liabilities	(223)
Amortization of discounted liabilities	109
Payments on existing obligations	(26)
Obligations under acquisition agreements at December 31, 2017	11,334
Adjustment to deferred liabilities	(7,747)
Amortization of discounted liabilities	345
Payments on existing obligations	(66)
Obligations under acquisition agreements at December 31, 2018	$3,866

As of December 31, 2018, the $3,866 in remaining obligations under product acquisitions and licensing agreements is included in other liabilities.

(10) Commitments

The Company has various lease agreements for offices as well as long-term ground leases for its facilities at Axis, AL, Hannibal, MO and Marsing, ID. The office leases contain provisions to pass through to the Company its pro-rata share of certain of the building's operating expenses. The long-term ground lease at Axis, AL is for twenty years (commencing May 2001) with up to five automatic renewals of three years each for a total of thirty-five years. The long-term ground lease at Hannibal, MO is for a period of 20 years (commencing December 2007) with automatic one year extensions thereafter, subject to termination with a twelve-month notice. Rent expense for the years ended December 31, 2018, 2017 and 2016 was $1,706, $1,102 and $946. In addition, the Company has various vehicle lease agreements for its sales force. Vehicle lease expense for the years ended December 31, 2018, 2017 and 2016 was $779, $529, and $555 respectively.

Future minimum lease payments under the terms of the leases are as follows:

Year ending December 31,	
2019	$6,108
2020	5,133
2021	3,385

2022	1,074
2023	495
Thereafter	1,335
	$17,530

(11) Research and Development

Research and development expenses which are included in operating expenses were $9,164, $8,455 and $6,998 for the years ended December 31, 2018, 2017 and 2016, respectively.

(12) Equity Plan Awards

Under the Company’s Equity Incentive Plan of 1993, as amended (“the Plan”), all employees are eligible to receive non-assignable and non-transferable restricted stock, options to purchase common stock, and other forms of equity. As of December 31, 2018, the number of securities remaining available for future issuance under the Plan is 1,568,888.

Incentive Stock Option Plans (“ISOP”)

Under the terms of the Company’s ISOP, under which options to purchase common stock can be issued, all employees are eligible to receive non-assignable and non-transferable options to purchase shares. The exercise price of any option may not be less than the fair market value of the shares on the date of grant; provided, however, that the exercise price of any option granted to an eligible employee owning more than 10% of the outstanding common stock may not be less than 110% of the fair market value of the shares underlying such option on the date of grant. No options granted may be exercisable more than ten years after the date of grant.

In 2018, 2017 and 2016, no options were granted.

Option activity within each plan is as follows:

	Incentive Stock Option Plans	Weighted Average Price Per Share	Exercisable Weighted Average Price Per Share
Balance outstanding, December 31, 2015	626,845	$ 9.25	$ 7.73
Options exercised,	(58,900)	$ 7.50	
Options forfeited,	(26,040)	11.49	
Balance outstanding, December 31, 2016	541,905	$ 9.33	$ 7.97
Options exercised,	(55,979)	$ 8.37	
Options forfeited,	(13,143)	11.49	
Balance outstanding, December 31, 2017	472,783	$ 9.38	$ 9.38
Options exercised,	(88,719)	$ 10.62	
Options forfeited,	—	—	
Balance outstanding, December 31, 2018	384,064	$ 9.10	$ 9.10

Information relating to stock options at December 31, 2018 summarized by exercise price is as follows:

	Outstanding Weighted Average			Exercisable Weighted Average	
Exercise Price Per Share	Shares	Remaining Life (Months)	Exercise Price	Shares	Exercise Price
Incentive Stock Option Plan:					
$7.50	229,545	23	$ 7.50	229,545	$ 7.50

$11.32-$14.75	154,519	70	$ 11.48	154,519	$ 11.48
	384,064	42	$ 9.10	384,064	$ 9.10

During 2017 and 2016, the Company recognized stock-based compensation expense related to incentive stock options of $345, and $354, respectively. During 2018, the Company did not recognized stock-based compensation expense related to incentive stock options.

The weighted average exercise prices for options granted and exercisable and the weighted average remaining contractual life for options outstanding as of December 31, 2018 and 2017 was as follows:

	Number of Shares	Weighted Average Exercise Price	Weighted Average Remaining Contractual Life (Months)	Intrinsic Value (thousands)
As of December 31, 2018:				
Incentive Stock Option Plans:				
Outstanding	384,064	$ 9.10	42	$ 2,338
Vested	384,064	$ 9.10	42	$ 2,338
Exercisable	384,064	$ 9.10	42	$ 2,338
As of December 31, 2017:				
Incentive Stock Option Plans:				
Outstanding	472,783	$ 9.38	57	$ 4,853
Vested	472,783	$ 9.38	57	$ 4,853
Exercisable	472,783	$ 9.38	57	$ 4,853

The total intrinsic value of options exercised during 2018, 2017 and 2016 was $955, $545, and $493, respectively. Cash received from stock options exercised during 2018, 2017, and 2016 was $951, $468, and $442, respectively.

Nonstatutory Stock Options (“NSSO”)

The Company did not grant any non-statutory stock options during the three years ended December 31, 2018.

Common Stock Grants

During 2018, the Company issued a total of 282,030 shares of common stock to certain employees and non-executive board members. Of these, 25,312 shares vest immediately, 1,017 shares will vest 6 months from the employee’s employment date, 1,017 shares will vest eighteen months from the employee’s employment date, 5,250 shares will vest two years from the employee’s employment date, and majority of the balance will cliff vest after three years of service. The fair values of the grants range from $16.85 to $23.60 per share based on the publicly traded share prices as of the market close on the date of grants. The total fair value of $5,651 is being recognized over the vesting period, which is representative of the related service periods. During 2018, 33,269 shares of common stock granted to employees were forfeited.

During 2017, the Company issued a total of 290,977 shares of common stock to certain employees and non-executive board members. Of these, 26,820 shares vest immediately, 1,300 shares will vest one-half each year on the anniversaries of the employee’s employment date, 1,782 shares will vest two years from the employee’s employment

date, and the balance will cliff vest after three years of service. The fair values of the grants range from $14.92 to $19.90 per share based on the publicly traded share prices as of the market close on the date of grants. The total fair value of $4,726 is being recognized over the vesting period, which is representative of the related service periods. During 2017, 20,815 shares of common stock granted to employees were forfeited.

A status summary of non-vested shares as of December 31, 2018 and 2017, are presented below:

	December 31, 2018		December 31, 2017	
	Number of Shares	Weighted Average Grant Date Fair Value	Number of Shares	Weighted Average Grant Date Fair Value
Nonvested shares at January 1st	391,753	$ 15.61	324,756	$ 14.75
Granted	282,030	20.21	290,977	16.24
Vested	(53,304)	17.06	(203,165)	15.14
Forfeited	(33,269)	17.29	(20,815)	15.29
Nonvested shares at December 31st	587,210	$ 17.59	391,753	$ 15.61

During 2018, 2017 and 2016, the Company recognized stock-based compensation expense related to restricted shares of $3,657, $2,705, and $1,630, respectively.

Performance Based Stock Grants

During the year ended December 31, 2018, the Company issued a total of 130,332 performance based shares to employees. The shares granted during 2018 have an average fair value of $18.74. The fair value was determined by using the publicly traded share price as of the market close on the date of grant. The Company will recognize as expense the value of the performance based shares over the required service period from grant date. The shares will cliff vest on March 9, 2021 with a measurement period commencing January 1, 2018 and ending December 31, 2020. Eighty percent of these performance based shares are based upon the financial performance of the Company, specifically, an earnings before income taxes (“EBIT”) goal weighted at 50% and a net sales goal weighted at 30% . The remaining 20% of performance based shares are based upon AVD stock price appreciation over the same performance measurement period. The EBIT and net sales goals measure the relative growth of the Company’s EBIT and net sales for the performance measurement period, as compared to the median growth of EBIT and net sales for an identified peer group. The stockholder return goal measures the relative growth of the fair market value of the Company’s stock price over the performance measurement period, as compared to that of the Russell 2000 Index and the median fair market value of the common stock of the comparator companies, identified in the Company’s 2017 Proxy Statement. All parts of these awards vest in three years, but are subject to reduction to a minimum (or even zero) for recording less than the targeted performance and to increase to a maximum of 200% for achieving in excess of the targeted performance.

During the year ended December 31, 2017, the Company issued a total of 128,594 performance based shares to employees. The shares granted during 2017 have an average fair value of $15.43. The fair value was determined by using the publicly traded share price as of the date of grant. The Company will recognize as expense the value of the performance based shares over the required service period from grant date. The shares will cliff vest on February 8, 2020 with a measurement period commencing January 1, 2017 and ending December 31, 2019. Eighty percent of these performance based shares are based upon the financial performance of the Company, specifically, an earnings before income taxes (“EBIT”) goal weighted at 50% and a net sales goal weighted at 30% . The remaining 20% of performance based shares are based upon AVD stock price appreciation over the same performance measurement period. The EBIT and net sales goals measure the relative growth of the Company’s EBIT and net sales for the performance measurement period, as compared to the median growth of EBIT and net sales for an identified peer group. The stockholder return goal measures the relative growth of the fair market value of the Company’s stock price over the performance measurement period, as compared to that of the Russell 2000 Index and the median fair market value of the common stock of the comparator companies, identified in the Company’s 2016 Proxy Statement. All parts of these awards vest in three years, but are subject to reduction to a minimum (or even zero) for recording less than the targeted performance and to increase to a maximum of 200% for achieving in excess of the targeted performance.

On January 6, 2016, the Company granted a total of 52,170 performance based shares that will cliff vest on January 6, 2019 with a measurement period commencing January 1, 2016 through December 31, 2018, provided that the participating employees are continuously employed by the Company during the vesting period. Eighty percent of these performance based shares are based upon financial performance of the Company, specifically, an earnings before income tax (“EBIT”) goal weighted at 50% and a net sales goal weighted at 30%. The remaining 20% of performance based shares are based upon AVD stock price appreciation over the same performance measurement period. The EBIT and net sales goals measure the relative growth of the Company’s EBIT and net sales for the performance measurement period, as compared to the median growth of EBIT and net sales for an identified peer group. The stockholder return goal measures the relative growth of the fair market value of the Company’s stock price

over the performance measurement period, as compared to that of the Russell 2000 Index and the median fair market value of the common stock of the comparator companies, identified in the Company's 2015 Proxy Statement. All parts of these awards vest in three years, but are subject to reduction to a minimum (or even zero) for meeting less than the targeted performance and to increase to a maximum of 200% for meeting in excess of the targeted performance.

As of December 31, 2018, the performance based shares related to EBIT and net sales have an average fair value of $18.27 per share. The fair value was determined by using the publicly traded share price as of the market close on the date of grant. The performance based shares related to the Company's stock price have an average fair value of $15.43 per share. The fair value was determined by using the Monte Carlo valuation method. For awards with performance conditions, the Company recognizes share-based compensation cost on a straight-line basis for each performance criteria over the implied service period.

As of December 31, 2017, the performance based shares related to EBIT and net sales have an average fair value of $16.10 per share. The fair value was determined by using the publicly traded share price as of the date of grant. The performance based shares related to the Company's stock price have an average fair value of $12.60 per share. The fair value was determined by using the Monte Carlo valuation method. For awards with performance conditions, the Company recognizes share-based compensation cost on a straight-line basis for each performance criteria over the implied service period.

As of December 31, 2016, the performance based shares related to EBIT and net sales have an average fair value of $15.08 per share. The fair value was determined by using the publicly traded share price as of the date of grant. The performance based shares related to the Company's stock price have an average fair value of $11.63 per share. The fair value was determined by using the Monte Carlo valuation method. For awards with performance conditions, the Company recognizes share-based compensation cost on a straight-line basis for each performance criteria over the implied service period.

During 2018, 2017 and 2016, the Company recognized stock-based compensation expense related to performance based shares of $2,148, $1,248, and $995, respectively. In 2018, the Company assessed the likelihood of achieving the performance measures based on peer group information currently available for the performance based shares granted in 2016. Based on the performance thus far, the Company has concluded that it is likely that the performance measure based on EBIT and net sales will be met at 200% of targeted performance and have recorded the related additional expense in 2018. The performance shares based on market price are expected to be met at 125% of targeted performance. The effect of market conditions for performance shares based on market are included in the grant date fair value valuation and no additional expenses were recognized in 2018.

As of December 31, 2018, the Company had approximately $2,565 of unamortized stock-based compensation expenses related to unvested performance based shares. This amount will be recognized over the weighted-average period of 1.9 years. This projected expense will change if any performance based shares are granted or cancelled prior to the respective reporting periods or if there are any changes required to be made for estimated forfeitures.

A summary of non-vested shares as of December 31, 2018 and 2017, is presented below:

	December 31, 2018		December 31, 2017	
	Number of Shares	Weighted Average Grant Date Fair Value	Number of Shares	Weighted Average Grant Date Fair Value
Nonvested shares at January 1st	186,057	$ 14.93	119,022	$ 14.18
Granted	130,332	18.74	128,594	15.43
Vested	(22,857)	11.90	(48,046)	14.92
Forfeited	(6,455)	16.22	(13,513)	13.08
Nonvested shares at December 31st	287,077	$ 16.87	186,057	$ 14.93

Performance Incentive Stock Option Plan

For the three years ended December 31, 2018, the Company did not grant any employees performance incentive stock options to acquire shares of common stock.

Performance option activity is as follows:

	Incentive Stock Option Plans	Weighted Average Price Per Share	Exercisable Weighted Average Price Per Share
Balance outstanding, December 31, 2016	82,334	$ 11.49	$ —
Options forfeited	(668)	11.49	—
Balance outstanding, December 31, 2017	81,666	$ 11.49	$ 11.49
Additional vesting based on performance	77,598	11.49	11.49
Options exercised	(18,853)	11.49	11.49
Balance outstanding, December 31, 2018	140,411	$ 11.49	$ 11.49

Information relating to performance stock options at December 31, 2018 is summarized by exercise price is as follows:

	Outstanding Weighted Average			Exercisable Weighted Average	
Exercise Price Per Share	Shares	Remaining Life (Months)	Exercise Price	Shares	Exercise Price
Performance Incentive Stock Option Plan:	140,411	72	$ 11.49	140,411	$ 11.49

The weighted average exercise price for performance options granted and exercisable and the weighted average remaining contractual life for performance options outstanding as of December 31, 2018 and 2017 was as follows:

	Number of Shares	Weighted Average Exercise Price	Weighted Average Remaining Contractual Life (Months)	Intrinsic Value (thousands)
As of December 31, 2018:				
Performance Incentive Stock Option Plans:				
Outstanding	140,411	$ 11.49	72	$ 520
Expected to Vest	140,411	$ 11.49	72	$ 520
Exercisable	140,411	$ 11.49	72	$ 520
As of December 31, 2017:				
Performance Incentive Stock Option Plans:				
Outstanding	81,666	$ 11.49	84	$ 666
Expected to Vest	81,666	$ 11.49	84	$ 666
Exercisable	81,666	$ 11.49	84	$ 666

During 2017 and 2016, the Company recognized stock-based compensation expense related to performance incentive stock options of $416 and $188, respectively. During 2018, the Company did not recognize stock-based compensation expense related to performance incentive stock options.

(13) Accumulated Other Comprehensive Loss

The following table lists the beginning balance, annual activity and ending balance of each component of accumulated other comprehensive loss:

	FX Translation
Balance, December 31, 2015	$ (3,541)
Other comprehensive loss before reclassifications	(1,310)
Balance, December 31, 2016	(4,851)

Other comprehensive loss before reclassifications	344
Balance, December 31, 2017	(4,507)
Other comprehensive loss before reclassifications	—
Balance, December 31, 2018	$ (4,507)

(14) Equity Method Investments

The Company utilized the equity method of accounting with respect to its investment in TyraTech Inc. (“TyraTech”), a Delaware corporation that specializes in developing, marketing and selling pesticide products containing essential oils and other natural ingredients, until the Company acquired all of TyraTech’s remaining outstanding shares as of November 8, 2018 (see Note 8). For the period from January 1, 2018 to November 8, 2018, and the years ended December 31, 2017 and 2016, the Company recognized losses of $1,424, $177, and $353, respectively on its equity method investment. In addition, the Company recognized a gain in the amount of $1,463 in connection with the re-measurement of its pre-existing equity interest in TyraTech at fair value as of the acquisition date of the remaining outstanding shares. As of December 31, 2017 and 2016, the Company’s ownership position in TyraTech was approximately 15.11%.

On August 2, 2016, AMVAC BV entered into a joint venture with Huifeng. The entity, Hong Kong JV, is intended to focus on activities such as market access and technology transfer between the two members. AMVAC BV is a 50% owner of the entity. No material contributions were made to this joint venture in 2016.

On June 27, 2017, both AMVAC BV and Huifeng (Hong Kong) Ltd. made individual capital contributions of $950 to the Hong Kong JV. As of December 31, 2018 and 2017, the Company's ownership position in the Hong Kong JV was 50%. The Company utilizes the equity method of accounting with respect to this investment. On July 7, 2017, the Hong Kong JV purchased the shares of Profeng Australia, Pty Ltd. ("Profeng"), for a total consideration of $1,900. The purchase consists of Profeng Australia, Pty Ltd Trustee and Profeng Australia Unit Trust. Both Trust and Trustee were previously owned by Huifeng via its wholly owned subsidiary Huifeng (Hong Kong) Ltd. For the years ended December 31, 2018 and 2017, the Company recognized a loss and an income of ($427) and $128, respectively, as a result of the Company's ownership position in the Hong Kong JV. There was no loss or income recognized in 2016. At December 31, 2018 and 2017, the carrying value of the Company's investment in the Hong Kong JV was $722 and $1,078, respectively.

(15) Cost Method Investment

In February 2016, AMVAC BV made an equity investment in Biological Products for Agriculture ("Bi-PA"). Bi-PA develops biological plant protection products that can be used for the control of pests and disease of agricultural crops. As of December 31, 2018 and 2017, the Company's ownership position in Bi-PA was 15%. The Company utilizes the cost method of accounting with respect to this investment and periodically reviews the investment for possible impairment. There was no impairment on the investment as of December 31, 2018 and 2017. The investment is not material and is recorded within other assets on the consolidated balance sheets.

(16) Share Repurchase Program

On November 5, 2018, pursuant to a Board of Directors resolution, the Company announced its intention to repurchase an aggregate number of shares with a total purchase price not to exceed $20,000 of its common stock, par value $0.10 per share, in the open market, depending upon market conditions over the short to mid-term. The Shares Repurchase Program expires on March 8, 2019. Share repurchases may be executed through various means, including, without limitation, open market transactions, privately negotiated transaction or pursuant to any trading plan that may be adopted in accordance with Rule 10b5-1 of the Securities and Exchange Act of 1934, as amended, subject to market conditions, applicable legal requirements and other relevant factors. The Shares Repurchase Program does not obligate the Company to acquire any particular amount of shares of common stock and the program may be suspended or discontinued at any time.

The table below summarizes the number of shares of our common stock that were repurchased during the three months ended December 31, 2018. The shares and respective amount are recorded as treasury shares on the Company's consolidated balance sheet.

Month ended	Total number of shares purchased	Average price paid per share	Total amount paid	Maximum dollar value of shares that may yet be purchased under

				the program
November 30, 2018	196,858	$ 17.10	$ 3,366	
December 31, 2018	255,500	15.35	3,921	
	452,358	$ 16.11	$ 7,287	$ 12,713

(17) Quarterly Data—Unaudited

	March 31	June 30	September 30	December 31
Quarterly Data—2018				
Net sales	$104,108	$107,046	$111,780	$131,338
Gross profit	41,051	43,297	45,300	52,983
Net income attributable to American Vanguard	4,655	5,599	6,525	7,416
Basic net income per share	0.16	0.19	0.22	0.25
Diluted net income per share	0.16	0.19	0.22	0.25
Quarterly Data—2017				
Net sales	$70,673	$77,905	$89,975	$116,494
Gross profit	30,084	34,335	38,032	44,941
Net income attributable to American Vanguard	3,452	4,304	4,089	8,429
Basic net income per share	0.12	0.15	0.14	0.29
Diluted net income per share	0.12	0.15	0.14	0.28

(1) Fourth quarter 2017 net income includes a provisional one-time tax benefit of $3,433 recorded for our initial analysis of the impact of the Tax Act.

Note: Totals may not agree with full year amounts due to rounding and separate calculations each quarter.

(18) Forward Cover Contract

As of October 26, 2018, the Company entered into a foreign exchange forward cover contract in connection with the anticipated acquisition of the Agrovant and Defensive businesses in Brazil (see note (19) below). The forward cover contract's settlement amount was determined based on the BRL/USD exchange rate on December 27, 2018 and the Company was required to make a payment (and record a loss) under the terms of the contract in the amount of $1,401. Under the accounting rules for derivative financial instruments, a gain or loss related to a contract, which is entered into in connection with an anticipated business combination, is recorded in the statements of operations. There were no similar losses or gains recorded in either 2017 or 2016.

(19) Subsequent Events

On January 10, 2019, the Company completed the acquisition of all of the outstanding shares of stock of two affiliated businesses, Agrovant and Defensive, which are located in Jabocitabal in the state of Sao Paulo, Brazil, in exchange for the equivalent of $22,099, plus potential future earn-out consideration. These companies were founded in 2000 and are suppliers of crop protection products and micronutrients with focus on the fruit and vegetable market segments. The acquisition will be accounted for as a business combination.

During January 2019, the Company paid $2,605 to purchase 158,048 shares of the Company's common stock at an average share price of $16.48 per share. There were no other purchases from the start of February 2019 until the date of filing this Form 10-K.