Virus Yellows Threatens Western Sugar Beet Industry

First major outbreak of beet leafhoppers east of Continental Divide . . . Significant increase last season in mechanical thinning

DENVER—Virus yellows, most serious menance to beet growers in western Europe, should receive increased study by American sugar beet growers. G. H. Coons, USDA pathologist, said at the eighth general meeting of the American Society of Sugar Beet Technologists here recently that in Europe losses in crop yields run as high as 50% as a result of virulent virus yellows. Milder strains, he stated, are widely spread in California and to some extent in Colorado. Though the disease has existed in California for many years, it was suspected for some time that unhealthy beets were a result of nitrogen deficiency or other causes. It was not until 1951 that a study of the symptoms indicated that the damage was being done by a virus. Subsequent work showed that virus yellows was responsible.

Martin G. Weiss, Field Crop Research Branch, USDA, stressed the importance of cooperation in research in the opening session of the meeting

Papers were presented which gave the first results of appraisal tests to determine if a full investigation of virus yellows, which is vectored by aphids, is justified. Dr. Coons, in conjunction with J. O. Gaskill and L. B. Daniels, Colorado Agricultural Experimental Station, found in controlled plot tests at Fort Collins, Colo., that a loss of from 10 to 15% in root yield was caused by virus yellows. No significant effect on sucrose content was observed.

In tests conducted last year in California, C. W. Bennett, Charles Price, and Glenn E. Gillespie, USDA, found that average acre yields were 18.7 tons in inoculated plots and 28.8 tons in check plots (a reduction of 30% in sugar yield per acre). The time of infestation materially affected the degree of damage and weed hosts appeared to be of little importance in the spread of the disease. A systemic organic phosphate insecticide, dimenton, was used in the tests to spray at proper time both diseased and check spots.

Simply, the disease blocks the flow of carbohydrates from the leaves of the beets. There is no direct correlation between the intensity of the yellow color of the leaves and losses in yield. Control in the field has been found difficult in Europe. Dr. Coons advocates attention to development of breed varieties that are resistant to virus yellows as an attack on the problem. Limited work indicates that there are genes with virus yellows resistance characteristics in some inbreds.

Spread of Leafhoppers. In 1953, the first serious occurence of beet leafhoppers in sugar-beet producing areas east of the Continental Divide was seen in southwestern Kansas. Losses in sugar beet yields were as high as 50% in many areas. J. R. Douglass, USDA, believes that these leafhoppers, which transmit the virus, causing curly tops, came from breeding areas of southern New Mexico and western Texas. Until the development of curly top–resistant beet varieties, the disease was serious in the intermountain area and many sugar plants were forced to close and shift to noninfested areas. While resistant strains have been developed and are now used, there is no commercially available variety that is resistant to both curly top and leaf spot, another disease prevalent in eastern growing areas. Douglass said that beet leafhopper weed-host complex has changed in favor of the insect in many areas during the past 30 years and there is a possibility that the leafhopper is becoming acclimated to new areas. However, he added that a serious curly top epidemic one season is no criterion that it will be followed by another in the succeeding season.

N. J. Giddings, USDA, confirmed that leafhoppers entering the Kansas and Colorado areas carried curly top virus strains that might be disastrous to the beet sugar industry there and advocated that growers must seek sugar beet varieties resistant to the disease. In a second paper, he showed that plants infected by virus yellows and then inoculated with curly top are more likely to be severely infected with the second disease than comparable healthy plants.

Industry

Atlas Expands Toward Food Industry

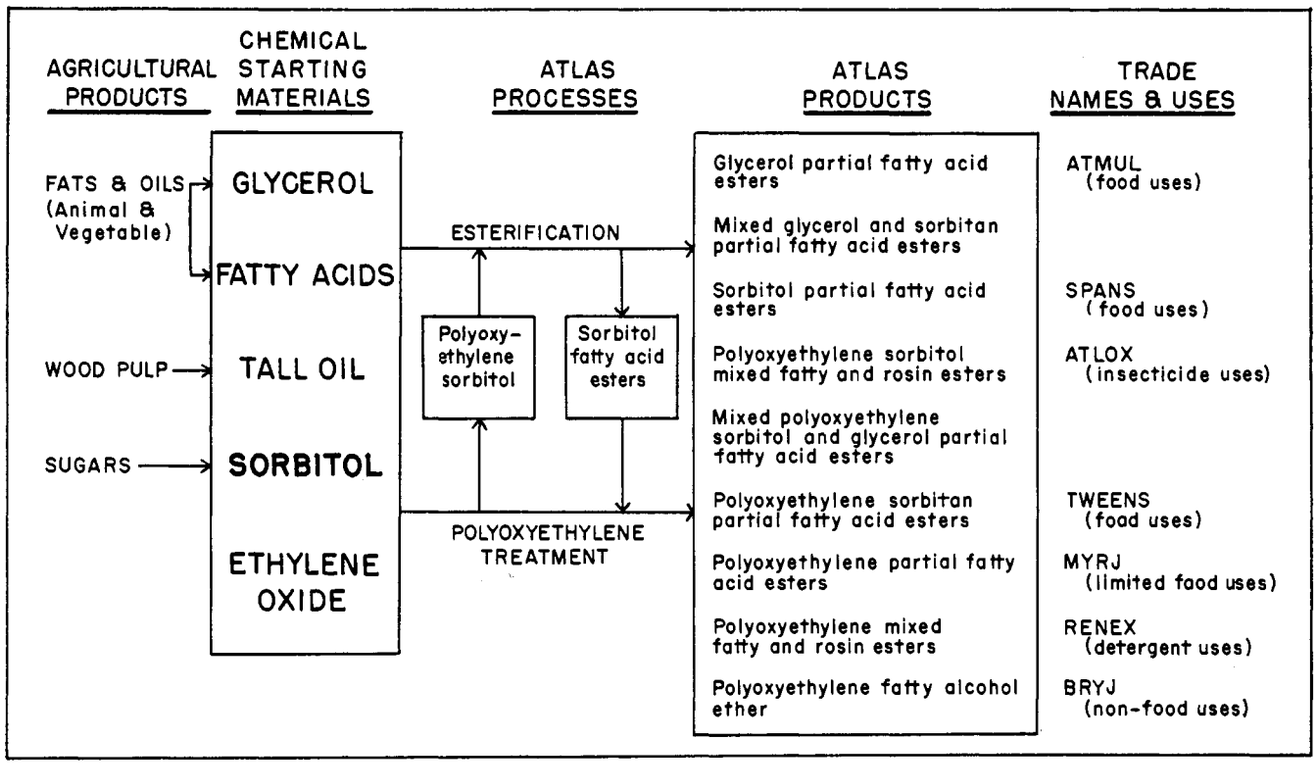
ATLAS Powder Co. has announced plans for moving more strongly into the manufacture and distribution of products for the food industry. The company will build two new plants this year for the production of mono- and diglycerides and other emulsifiers, including polyoxyethylene-modified materials, for the food industry. At the same time the sales and research groups of the company's chemicals department will be realigned with the formation of a special food industry division.

The larger of the two new plants will be built at Memphis, Tenn., at a cost of more than $1 million and is scheduled for completion by late 1954. The other plant, at Bradford, Ontario, will cost about $350,000 and will be in operation in about six months.

Both plants will produce emulsifiers for use in baked goods, ice cream, candy, and other foods. The emulsifiers will be fatty acid derivatives of sorbitol and glycerol modified with polyoxyethylene radicals, resin acids, or other modifying groups (*see chart*).

Already Active in Food Industry. This new construction step and the formation of the food industry division serves as a declaration that Atlas will broaden its efforts in the food field, where it already has an active position. The strength of that position has grown from success with mono- and diglyceride emulsifiers which the company has been marketing during recent years. With both price and supply of fats and oils making them very attractive as raw materials for chemical manufacturing, Atlas has decided to push the development of a position there parallel to its basic position in the use of sugars as raw materials for sorbitol. Thus the company will be becoming an increasing factor in the chemical conversion of agricultural products while at the same time devoting an increasing amount of its attention to the food field.

One of the company's efforts received a setback recently when its Myrj-45 emulsifier, an ester of a polymer of ethylene oxide (polyoxyethylene stearate), was not included as an optional



ingredient in the standards of identity for bread under the Food and Drug Law. While sale of Myrj-45 for major food uses was dropped, scientific studies looking toward establishment of its suitability for such uses are being continued. Atlas has continued to supply certain of its fatty acid derivatives of sorbitol (span) and their polyoxyethylene derivatives (tweens) to manufacturers who desire to use them in food.

Geographical Spread. The new construction gives Atlas multiplant capacity for these products with cheaper distribution through geographical decentralization. A plant has been operating for some time at Atlas Point, Del. The Memphis plant will be situated adjacent to the HumKo company, a subsidiary of National Dairy Products Corp., from which it will draw some of its raw materials. Atlas is at present distributor for the fatty acids produced by the Trendex division of HumKo, sold under the trade name Hystrene.

The new food industry division of Atlas will be under the general supervision of William Hays, assistant to the general manager of the chemicals department, Kenneth Mulford. Mr. Hays will be responsible for the development and execution of policies with respect to the marketing of sorbitol and emulsifiers to the food industry. Carl Pratt will handle customer relations in the new division. In addition, Atlas has organized a distinct group in its central research laboratories in Wilmington, Del., for research work on food products.

Atlas will continue to sell its food emulsifiers to the baking trade through R. T. Vanderbilt Co., and to the ice cream industry through R. G. Moench and Co. It will sell directly to other food users.

Ammonia Plant Has Novel Design Features

Spencer Chemical's highly integrated process uses one third of the normal operating staff

SPENCER CHEMICAL'S new ammonia works, at Vicksburg, Miss., dedicated on Feb. 2, is designed for high integration, resulting in low cost and high operating efficiency. Company officials expect the process to compete with many of the older plants built with inflated dollars during the last 10 years. Although 1951 estimates of the plant cost were set at $14 million, the unit was constructed for less than this amount.

Spencer claims many "firsts" for this operation. Storage facilities for ammonium nitrate solutions—two 100-foot diameter tanks holding a total of 15,000 tons—are the largest unsupported dome tanks with umbrella roofs ever constructed by Chicago Bridge & Iron. Liquid oxygen from the air separation plant is withdrawn from the distillation tower by a centrifugal pump. To eliminate large compressors in the synthesis gas recirculating system, a German-made inline centrifugal compressor does the job—without oil contamination to the product. It is the first commercial ammonia process using partial oxidation of natural gas to supply hydrogen for the synthesis unit. Three gas streams, methane, air, and nitrogen, are fed through a 2000-hp. reciprocating compressor as separate flows for greater power efficiency.

Compact arrangement of the facilities, outdoor construction of many units, and considerable instrumentation add unique features to the operation. The plant can be controlled by eight operators, one supervisor, and an assistant supervisor per shift. It is designed to produce 210 tons of 99.99% anhydrous ammonia per day, 110 tons of 60% nitric acid, 140 tons of neutral 84% ammonium nitrate solution, and four grades of ammoniating solutions totaling 350 tons.

Vicksburg follows the pattern of the company's other operations—Calumet City, Ill., Pittsburg, Kan., Henderson, Ky., and Charlestown, Ind.—all are located on inland waterways for barge shipment if freight rates become excessive. Operations at Vicksburg are also nonunion.

Many factors were considered in the Vicksburg location, revealed Kenneth