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be grown without the intensive use of fungicides or bactericides. When such applications have been found a futile waste of effort and money, they risk a no-treatment program during some seasons when control measures would be profitable.

Spray Programs Most Consistent on Spray Trees

The most consistent spray programs are applied on tree crops where the grower has a large fixed capital investment to protect. Copper fungicides, sulfur, and lime sulfur are well entrenched in this market. They are fungicidally effective and relatively inexpensive. The newer organic fungicides are finding a limited place where their greater safety justifies their higher cost per acre.

Of more than 80,000 acres of apples in Pacific Slope states, less than one half regularly require fungicides. For almonds, fungicides are needed in the spring if late rains occur. Lack of such rains during the past few years has almost eliminated the disease potential. Few apricots are grown in areas where treatment is needed for shot hole protection. Most of them are very susceptible to loss by brown rot blight of the blossoms and most of the acreage is sprayed. Efforts to promote the use of the new organic fungicides on apricots have not been very successful.

Dr. Isenhour said that field crops such as sugar beets, cotton, and grain have few foliage diseases and fungicide treatments never have been justified.

Not so long ago sodium chlorate was the only weed exterminator employed on a large commercial scale, and then chiefly by railroads. Today 2,4-dichlorophenoxyacetic acid and the 2,4,5-trichloro product are in use throughout the land for weed killing, and business in all herbicides has grown to around \$35 million annually. This estimate was made by Chester E. Otis of Dow Chemical Co.

There are 25 or more different basic materials employed as herbicides, Mr. Otis figures, and he thinks there must be at least 50 manufacturers exclusive of formulators in the market.

Otis estimated that the use of 2,4-D in the West has increased, in terms of the acid, from 2.6 million pounds in 1950 to 3.5 million in 1952. Usage for 1953 was placed at 3,850,000 pounds, and for 1957 at 5 million pounds. He thought the use of 2,4-D for perennial, selective, ditchbank, and roadside weed control has about leveled off. It was expected that brush control would account for the increased disappearance of 2,4-D during the next five years; chemical reclamation of brush-covered range land will be of

large-scale commercial importance by 1957.

In a discussion on fumigants, A. F. Swain, American Potash and Chemical Corp., related that hydrogen cyanide for years was the oldest and best known fumigant for the control of scale insects on citrus trees. For this purpose high toxicity, extreme rapidity of action, and relatively low phytotoxicity under proper conditions made it ideal. But strains of insects developed resistance to HCN, and when parathion appeared on the scene the use of HCN fumigation de-

clined. Today, little is used on citrus in California. Its utilization as a flour mill and warehouse fumigant also has gone down.

In the past 15 years methyl bromide has taken over certain fumigant fields entirely. First among these is the dried fruit field, particularly where figs, dates, and seedless raisins are stored for any length of time. For this purpose methyl bromide was so much more satisfactory that it replaced HCN and ethylene oxide in almost one season. It has likewise taken over flour mill fumigation.

DDT and lindane among leading pesticide materials heading downward in price . . . Sales competition keen

MARKET CONDITIONS for leading insecticides and herbicides were far from stabilized at the start of April. Liberal supplies, a somewhat slower demand than expected, and some keen selling competition kept prices still subject to paring by leading manufacturers. This situation appears to stem from the unfavorable 1952 season when drought conditions in growing areas curtailed pesticide consumption far below government estimates.

Toward the end of March DDT found itself in the middle of a spirited selling contest during which prices slipped all the way to 23 cents per pound in car-lot quantities to formulators, freight allowed. Last September the car-lot market for technical DDT was as high as 48 cents a pound. Two leading manufacturers are particularly active in the market competition, according to reports.

Previously this year lindane came in for the same kind of competitive selling, probably worse than DDT. It is said that one manufacturer desirous of writing 1953 business in better volume slashed the price all the way from \$5.00 per pound to \$2.75 to formulators. This last quotation, for the 99% minimum gamma isomer material, was met by other producers.

Parathion, another large-volume insecticide, has also been on the easy side. In recent months the market has come down about 5 cents, establishing the truckload price at around 48 cents a pound for the 15% spray powder. The 25% dust-base parathion is quoted by one producer at 73 cents per pound, off about 14 cents from the end of last season.

Lindane Tops List In Expansion Goals

In a discussion on the influence of government regulations on plant expansions, held during the recent New York meeting of the Commercial Chemical

Development Association, it was shown that no portions of the expansion goals for agricultural chemicals remained to be filled as of Dec. 15, 1952. The possible exception at that time was phosphatic fertilizers of which only a small percentage remains unfilled.

C. E. Waring, vice president of Davison Chemical, showed that the DDT goal called for expansion of 52% over capacity existing on Jan. 1, 1951, an increase from 102 million pounds to 155 million pounds. This goal will be met by new projects.

Lindane calls for the largest capacity expansions, or from 700,000 pounds at the beginning of 1951 to 5.1 million pounds, an increase of 628%. The goal had been provided for toward the close of 1952. It is known that production was far from the goal during 1952 as the only figure issued for lindane by the Tariff Commission, for the month of July, indicated that it was then being made at an annual rate of 1,752,612 pounds. This, however, is only a one-month indication and actually may be far from the year's final result.

DDT Production Turns Downward

The Commission has just issued a preliminary report placing DDT output for last year at 99,444,572 pounds, compared with 106,139,000 pounds for 1951.

Production of 2,4-D is placed in this preliminary report at 33,560,000 pounds, compared with 31,537,322 pounds for 1951. These totals may not be comparable as the Commission's total for 1952 does not include esters and salts, whereas the 1951 figure does include derivatives.

Benzene hexachloride production is placed at 86,391,179 pounds for the year just passed, as against 116,605,230 pounds in 1951. Gamma isomer content of hexachlorocyclohexane is esti-

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mated at 13,308,474 pounds in contrast to 15,831,682 pounds for 1951.

The above production data for 1952 indicates that efforts were made in a number of directions of the industry to correct the oversupply situation. Sales competition and the downward trend in price for the leading organics would indicate that supplies are still on the liberal side. In commenting on this, one factor says the supplies could disappear rapidly if insect infestation appears early this year.

Fertilizer Sales Off, Expected To Gain Ground by Year End

A spot survey made by the National Fertilizer Association shows fertilizer sales falling behind the record pace set last year. Lower farm income is perhaps one reason for the slow market, but sales, in general, are somewhat better than expected on this basis.

Complacency, lower farm product prices both past and expected, and tight credit are also factors in the situation. Farmers are also probably counting on being able to get supplies when they want them at the time for application.

NFA figures that there are some bright aspects of the situation. The trade expects much and possibly all lost ground to be regained by the end of the year.

The picture varies widely from area to area and even within areas. The Midwest, for instance, is expected to exceed last year's tonnage by the end of the year. Last year's good results and intensified programs to use more fertilizer for cutting unit costs of production are expected to promote even more sales. The West Coast is also encouraging; movement there is equal to last year and in the Northwest, sales are ahead of this time last year.

Worst spots are the Southeast, where sales are off about 10% and in spots as much as 15 to 25%; and the drought areas of the Central and Southern Plains states.

In the Northeast, expectations are that this year's sales will not equal those of 1952 crop year, because of lower potato and milk prices. In the Middle Atlantic, sales are holding up. The Mountain states are well ahead of 1952 and the same is true for the Northern Great Plains.

Guatemala to Issue Import Permits after Pesticides Arrive

Import permits for insecticides, fungicides, and herbicides shipped to Guatemala will be issued after the arrival of the materials in Guatemalan ports according to a recent customs decree of the Guatemalan government.

After arrival of the shipment in a

Guatemalan port the importer must present a copy of the commercial invoice with the technical or chemical names of the ingredients, quantitative analysis of active ingredients, and a statement of recommended uses. A sample of the material may also be required.

Purpose of the decree is probably to protect Guatemalan importers against inferior and under-strength preparations. It is not expected that American exporters will have any difficulty in getting the permits if their materials have previously met USDA registration.

New Ammonia Plants Not Expected to Meet 1955 Goal

Ammonia production has fallen short of its goal set by the Defense Production Administration and despite projected new plants it is not expected that the balance of supply and demand will be reached by 1955, Wayne E. Kuhn, The Texas Co., said recently.

With demands for ammonia pyramiding there is a very real question whether or not there will be enough when industry meets its DPA production goal. The basic reason for the increased demand for ammonia is the increase in fertilizer consumption in the U. S. Over 75% of current ammonia is ultimately used as fertilizer, either by direct application of the ammonia or as nitrogen compounds such as ammonium nitrate, urea, or ammonium sulfate.

The DPA goal for ammonia production in 1955 has been set at 2.9 million tons. By present indications even this figure will not be sufficient to meet demands, according to Dr. Kuhn. As of December 1952, planned expansion remained 152,000 tons short of the DPA goal.

Staley's Sales Off \$13 Million; Soybean Situation Blamed

A. E. Staley Mfg. Co. reports a 1952 profit of \$3,572,314 on sales of \$142,496,484. In the previous year, the company's sales were \$155,868,369, while profits were \$3,667,482.

A. E. Staley, Jr., president, said that although profits were slightly lower, the company was encouraged by an upward earnings trend which prevailed throughout 1952. The year started out slow, with earnings at a year's low of \$516,552 in the first quarter, but gained momentum to reach a high of \$1,517,698 in the fourth quarter.

Reduced sales were attributed primarily to reduced operations in the soybean division, largely because of the confused situation created by price ceilings which encouraged an unsatisfactory relationship between the price of soybeans and the price of soybean oil and meal. Business conditions in the soybean industry were unfavorable at the beginning

of 1953, but Mr. Staley sees signs of improvement over the 1952 situation.

Harvests of corn and soybeans in 1952 were the second highest on record, which provides the encouraging outlook Mr. Staley foresees for the rest of 1953.

Profits and sales volume of the vegetable oil refinery, which processed 16% more oil in 1952 than in 1951, are expected to increase as a result of the plant expansion program now nearing completion.

Mr. Staley reported that the company's postwar modernization and expansion program is now complete and that expenditures for new construction will be appreciably lower in 1953.

Du Pont Sales at New High

Du Pont's sales reached a new high in 1952 of over \$1.6 billion. Earnings increased 6 cents a share to reach a total for the company of \$141.8 million.

According to the annual report, the sales peak resulted from greater production of newer products by new plants and processes.

Research expenditures were \$52 million, an increase of \$5 million over 1951. Biochemical research is getting increased emphasis and is directed toward feed supplements and remedies for use in animal husbandry. The new Stine Laboratory at Newark, Del., is equipped with specialized facilities "for an integrated long-range approach to this work," said the annual report.

Of total earnings per share, \$3.07 came from the company's operations and \$1.63 from General Motors dividends.

Borden's Profits Off 2%

Borden Co.'s sales improved for the third straight year in 1952, becoming the highest in history. Profits, on the other hand, declined 2%.

The sales total moved up 6% to \$768,019,612. Earnings amounted to \$17,667,137, about 2.3% of sales. The increased sales, according to President Theodore G. Montague, were due to increased volume principally.

Mr. Montague remarked in his letter to stockholders that the decline in Borden's profits followed the general trend of the food industry. Wages have risen rapidly, but productivity is lagging. Overproduction is putting an edge on competition and margins are being whittled down.

An analysis of the sales of the company's major product divisions showed that chemical sales fell below the 1951 record, but he predicted that 1953 will be a good year. The breakdown of product sales shows that 38% of Borden's income was derived from fresh milk sales, 18% from food products, 13% from milk specialties, 16% from ice cream, 10% from cheese, 2% from chemicals, and 3% from special products.