

Manufacturers of chlorinated insecticides

Companies

Allied Chemical (New York)
 American Potash (Los Angeles)
 Chemical Formulators (Nitro, W. Va.)
 Commercial Solvents (New York)
 Diamond Shamrock (Cleveland)
 Dow Chemical (Midland, Mich.)
 Du Pont (Wilmington, Del.)
 FMC (New York)
 Geigy Chemical (Ardsley, N.Y.)
 Hercules (Wilmington, Del.)
 Hooker Chemical (Niagara Falls, N.Y.)
 Lebanon Chemical (Lebanon, Pa.)
 Montrose Chemical (Los Angeles)
 Olin Mathieson (New York)
 PPG Industries (Pittsburgh, Pa.)
 Rohm and Haas (Philadelphia)
 Shell Chemical (New York)
 Sonford Chemical (Houston)
 Tenneco Chemicals (New York)
 Uniroyal (New York)
 Velsicol Chemical (Chicago)

Leading products

DDT, others
 Dechlorane
 Methoxychlor
 Dilan
 BHC, DDT
 Chlorfenson
 Methoxychlor
 Tetradifon
 Chlorobenzilate
 Toxaphene
 Lindane, endosulfan
 DDT
 DDT
 DDT
 BHC
 Dicofol
 Aldrin, dieldrin
 Toxaphene
 Terpene polychlorinates
 Aramite
 Chlordane, endrin,
 heptachlor

Sources: U.S. Tariff Commission, CW Pesticides Report, Apr. 12 and Apr. 26.

Fighting to hold a market

The chlorinated hydrocarbon pesticides are embroiled in a battle on two fronts—one against insects and their growing immunity to the chemicals; the other against human foes who contend that the chemicals irreversibly damage living systems. And while the long-term outlook does not seem to favor the pesticides (see also Viewpoint, p. 5), there's evidence in the marketplace that right now they are still doing well.

DDT, which has been drawing the concentrated fire of critics for some time, has actually been enjoying increasing sales of late. Production last year was 138 million lbs.—up sharply from 103.4 million lbs. in '67. Moreover, output in the first four months of this year is up 1.4% from the same period last year. This however, is still below DDT's peak year of '63, when output reached 178.9 million lbs.

Other chlorinated products, which seem destined for attack, primarily because they are in the same product

class with DDT, are following a similar market pattern. For example, the aldrin-toxaphene group, which includes most of these chlorinated organics, gained its output high point in '66, with 130.5 million lbs. And while production dropped in '67, to 120.2 million lbs., sales rose to 134.3 million lbs. by drawing on warehouse stockpiles. (One feature of the chlorinated products is long shelf life.) Last year's market data is not yet available, but sales will probably remain at about the '67 level.

Chlorinated products (including DDT) are easily the most important class of insecticides in dollar volume as well as poundage. They account for over 50% of the poundage and 45% of the dollar value of all synthetic organic insecticides. (Dollar portion is lower than poundage because the products' cost per pound is considerably less than the average for all insecticides—a major reason for their continuing popularity.) Pesticide makers

ring up about \$150 million/year in chlorinated insecticides sales—about \$20 million of which is DDT.

Moreover, the chlorinated herbicides—2,4-D and 2,4,5-T and their derivatives—account for more than 33% of all herbicide and plant-hormone sales on a poundage basis, 17% on a dollar volume. Annual sales of these herbicides are about \$75 million.

Shifting Mix: Although DDT volume is holding up well despite growing criticism of its use, the sales mix is shifting drastically. Domestic use is declining steadily, while exports rose from 81.8 million lbs. in '67 to 109.1 million lbs. last year (over 80% of total sales).

Moreover, exports during the first three months of this year were up more than 30% vs. the same period last year.

Most of the export surge is the result of AID's (Agency for International Development) program for mosquito control in malarial areas.

Domestically, objections to DDT's high level of sustained broad-spectrum toxicity have resulted in loss of markets to products such as methyl parathion, malathion and methoxychlor. But DDT's low cost (17-18¢/lb., compared with over 50¢/lb. for other chlorinated organics and more than \$1.50/lb. for some organic phosphates) and low application rate (because of resistance to breakdown) add up to low treatment cost. Result: DDT will probably hold its cotton-field market for some time to come.

But by '75, Arthur D. Little, Inc., predicts, DDT use will decline to 50% of its present volume and may eventually disappear entirely (*CW Pesticides Report*, Apr. 26). Many in the industry agree, point out that this is the path already followed by inorganics such as the arsenates and by benzene hexachloride. The former hit a peak in the early '40s, the latter in '51. Both now have relatively little market.

One cause for decline in use of a particular insecticide: insect resistance, which develops by natural selection. And the list of species resistant to DDT is lengthening.

Hastening the End: But DDT's critics are eager to hasten the end. And there is no question that they are meeting with increasing success. Among the signs: a ban on DDT in Arizona; cancellation of registrations

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MARKETS

in Michigan; a hearing before the Wisconsin Natural Resources Commission, in which DDT was assailed as an environmental contaminant; proposed anti-DDT laws in California and in Congress.

DDT makers are naturally defensive about their product. And the five producers* prefer to let the pesticide industry's trade spokesman, the National Agricultural Chemical Assn. (NACA), do the talking.

NACA has reacted strongly to the criticism, has organized a "DDT Task Force" to fight attempts of conservation organizations to have DDT banned or its use restricted.

But one DDT maker declares: "There's no truth in the statement that DDT is harmful. As far as man is concerned, it is the safest effective insecticide."

Another producer remarks: "We can't go much further without involving other pesticides, and if that happens it can't help but show how good DDT is."

And all the producers are aware that DDT's troubles can hurt elsewhere. Abner Feigin, Allied's production manager for pesticides, sums it up this way: "We are afraid that the campaign against DDT will lead to consumer rejection of other, much safer insecticides, such as TDE and methoxychlor."

Some of the other chlorinated pesticides are already losing their markets. But the problem can be traced to insect resistance rather than to human enemies—at least at present. For example, a professor at a Midwest agricultural college says, "Aldrin and heptachlor use dropped 15% in our state last year, is dropping more this year and they will probably disappear from use soon."

A marketing manager at one agricultural chemical company adds: "Aldrin use could decline faster than that of DDT."

One difficulty in assessing the chlorinated pesticide situation: with the exception of DDT, little production or sales data are available — and producers have considerable flexibility, can easily increase plant capacities to meet changing needs.

*Montrose has 80-million-lbs./year capacity; Diamond Shamrock, 35 million; Olin Mathieson, 30 million; Allied Chemical, 20 million; Lebanon Chemical, 15 million. But capacity of these plants is flexible and can be increased considerably on demand.

Concentration of Fire: Thus far, DDT rather than the broad range of chlorinated products has drawn the fire of critics. For example, the National Audubon Society recently set up a campaign to ban DDT. But it included methoxychlor among suggested substitutes.

And Victor Yannacone, Jr., attorney for the Environmental Defense Fund of Patchogue (New York), which sued for the ban of DDT in Michigan and Wisconsin, says: "We're not out to get other pesticides. We've attacked DDT solely on its chemical characteristics—persistence, stability, mobility, and tendency to concentrate in animal tissues. We don't have that kind of documentation on other pesticides."

But other chlorinated insecticides seem almost certain to be involved before the DDT battle is over. For example, Yannacone says, "The literature on dieldrin is commensurate with that on DDT. And we have data also on aldrin and heptachlor."

Moreover, he hints that action may be taken against a "federal agency that is planning to use dieldrin for control of fire ants in a wildlife preserve in Texas."

In addition, Yannacone says, EDF's next planned step is a suit to compel the U.S. Agriculture Dept. to modify its pesticide control procedures. (USDA is charged with the administration of the pesticide control program.)

USDA recently received a report from the National Academy of Sciences stating that present control methods "do not appear to insure the prevention of environmental contamination"—thus agreeing with one of EDF's major contentions (*CW*, June 21, p. 55).

Pressure for modification of the pesticide registration procedure is coming from within the federal government, too.

Pointing up government concern: Robert Finch, Secretary of Health, Education and Welfare, says this country is too far from the goal of restricting persistent insecticides (*CW*, May 3, p. 12). He has commissioned a study of pesticides and their relationship to the environment. The study is slated for completion by year's end.

In addition, Leslie Glasgow, Assistant Interior Secretary for Fish and Wildlife, says he is personally in favor of a ban on DDT.

END