Left: Sparse growth in tomato seed bed at Lodi, Calif., due to damping-off fungi and nutgrass. Right: Another section of seed bed treated before planting with a quart of Vapam per 100 sq. ft. No weeds, no damping-off

year with little fanfare on Rohm & Haas' part.

Besides these soil chemicals, several other new products are coming out this year. Geigy is introducing chlorobenzilate, a mitacide, and diazinon, a fly spray which may find use later for other pests. Rohm & Haas has FW 293 [1,1 - *bis*(chlorophenyl)trichloroethanol] in full scale field trials on mites. (Mite and codling moth resistance to present chemicals are serious problems in nearly all major agricultural areas of the West.)

Organic fungicides—captan, zineb, ziram, for instance—continue to replace copper types to an ever greater extent, moving especially into leaf curl control on peaches and scab control on apples. Hawaii's pineapple industry is giving captan full-scale field trials this year for heart rot control.

Systemics, principally Systox, continue to forge ahead in both California and Arizona for mite and aphid control on cotton, aphid control on alfalfa seed crops. In Washington, the systemic increase expected several years ago, especially on fruit trees, has not arrived. Systox on seed alfalfa, however, has been successful there, might be even more so as preliminary work at WSC's Prosser experiment station shows hullings are safe for livestock feed. Up in British Columbia, systemics are still being limited to greenhouse ornamentals, while down in New Mexico, they have declined. Price, toxicity, residue problems, and relatively poor results on spotted alfalfa aphid are reasons cited.

Antibiotics have gained their greatest toehold in California, particularly on pears, but use cannot be called "commercial" yet. In Arizona, experimental work on antibiotics is behind that in other states, but the outlook is termed "encouraging, with possible commercial use in 1956" for fireblight on deciduous fruit trees and ornamentals. And in New Mexico, the extension service has supplied terramycin to pear growers for experimental use the past two years. Results to date "may put New Mexico back into the pear growing business."

Aphids, Hoppers, and Flies Attack West

The spotted alfalfa aphid, formerly called the yellow clover aphid in the West, "is proving to be the most serious pest in California alfalfa history," says H. M. Armitage, chief of California's Bureau of Entomology. First disastrous aphid attacks in the West came in New Mexico in 1954, where losses were estimated at $4 million. Infestations in Arizona were likewise serious that year. Found first in southern California in February 1954, the pest spread to the northern end of the San Joaquin Valley by this season. Parathion, malathion, and Systox have given good control, and by summer's end the threat to California's $100 million hay industry appeared to be on the wane.

About 1.75 million acres of grasshopper-infested rangeland in parts of the 11 western states will be treated during the 1955 control season. USDA estimates hopper control on ranges and crops has saved over $1 billion since 1935.

To the south along the California-Mexico border, Mexican fruit fly control measures, under way since early 1954, continue. Early this year, malathion was substituted for tartar emetic, eliminating the need to respray following rain and making it possible to maintain regular three-week intervals between applications.

While active spraying continues to keep the pest out of California's rich agricultural lands, USDA entomologists are investigating possible insecticide-fertilizer combinations for fruit fly control. Only preliminary laboratory studies of soil insecticides have been completed, but results are encouraging. Isodrin has proved most effective; aldrin and BHC show considerable promise. Emergence of adult flies is not prevented by this treatment, but emerging flies are short-lived. USDA hopes field studies during this year's mango fruiting season will give results as promising as those obtained in the preliminary lab tests.

Sales Up in East, Despite Unfavorable Weather and Decline in Farmer's Income

LATE SUMMER estimates of sales of agricultural chemicals in the New England and Middle Atlantic states this season indicate an ultimate volume greater than that of the past two seasons. One producer of pesticides reported sales up 20% over last year. Another basic producer of a limited line of pesticides commented: "Our sales of pesticides in this area for the 1955 season are up considerably compared with 1954. However, our products are relatively new and their sales increases are rather sharp at present."

Most basic producers contacted echoed this optimistic appraisal of this year's eastern seaboard sales. Only one company reported lower sales and this was attributed to the early spring freeze.

Sales then were evidently better despite unfavorable weather. The effect of weather on the pesticide industry has been more pronounced this summer than in recent years. Drought conditions in New York reached such proportions by late July that Governor Harriman appealed to Agriculture Secretary Benson to declare certain regions around the Finger Lakes as a drought disaster area. Rainfall averaged less than one third of normal for several months; temperatures soared into the nineties day after day.

The hot, dry weather held back insect and fungus infestations in many areas. It also caused some set-back in the introduction of pre-emergence weed control on cotton. The weed problem proves far less serious in dry weather and the results are not as striking. Then too,

it is more difficult to control what weeds there are when the soil cracks open, permitting weed seeds to germinate below the depth of the treated layer of soil.

Sales Not Affected by Reduced Farm Income

Even though total farm income estimates are running lower than in previous years, "good" farmers are using pesticides at an increasing rate. None of the basic producers contacted felt that any decrease in farm income was affecting their sales. As one spokesman put it, "If bugs or diseases attack plants we find that the farmers are still willing to use pesticide chemicals regardless of their farm income."

The over-all effect of any farm income reduction so far has been insignificant compared with that of other factors which affect demand such as freezes, droughts, insect populations, or disease incidence.

A Study in Ethics

Price cutting and consignment selling is still plaguing the pesticides industry. There is little doubt that these practices have been harmful to manufacturers and formulators. As the demand for a new pesticide chemical grows, the price goes down. This will continue until those responsible for price cutting and the like come to an understanding about what prices will give fair margins of profit.

Some sources feel that a good selling season will help to improve the present price cutting practices. Also, the heavy technological demands and responsibilities placed upon the pesticide industry, particularly with respect to the Miller Bill, make it plain to the industry that steps must be taken to correct any unhealthy situations.

Although corrective measures have been limited this year, current signs point towards trade practice improvement in the future. One sales manager describes the price cutting situation as follows: "We don't see how it can get much worse than it is."

Changing Times

It is rather apparent that agricultural chemicals manufacturers are trying to reach the ultimate consumer. In many cases, this is accomplished by extensive advertising in farm journals of all types.

More and more emphasis is being placed behind products in which manufacturers have a preferred position rather than advertising a complete line. Putting increased efforts behind so-called "bread and butter" products is believed by executives in the East to be causing a stabilizing effect in the industry. In other words, the competitive premium tends to be more on product performance rather than on price advantage.

In some sales promotion work, there is greater tendency to be selective in products, also in the type of farmer who is sought as a customer. At the same time, however, some sales promotions are being concentrated in agricultural specialty areas, such as the Cotton Belt, where there are substantial potential markets for preferred products.

Advertising to reach the ultimate consumer may mean the elimination of certain middlemen when this is found necessary. This is done even if it means low prices and little profit.

Antibiotics Interest Cooling

Last year there was great enthusiasm in some quarters over the prospects for antibiotics as pesticidal chemicals. This year, some of that enthusiasm has waned. Most important reason for this ebbing interest has been the cost situation. Other sources have had disappointing experimental results and have consequently given up for the time being.

However, in at least one area results with antibiotics continue to be promising. Recent tests using streptomycin on tomatoes gave good results. Antibiotics not only reduced the loss of tomatoes through blight, but also increased the size and weight of the tomatoes. Most of this work has been done in Florida, but research management in New York is following it carefully.

Although research is pleased with these results, the future of antibiotics is definitely up in the air. Some sources feel their use is limited; others predict a considerable increase in their use next year. Price may be the deciding factor.

Systemics, BHC, and DDT

The future of systemic insecticides depends upon how well they roll with the familiar "one-two punch," which in this case is price and toxicity. Despite these limitations some systemics are gaining favor, not only in the Eastern part of the U. S. but throughout the country.

Systox appears to have become the most important commercially. Several others have shown promise. One company in the East is experimenting with a product, identified now as 3911. This product is believed effective in protecting cotton seeds against thrips. The pesticide is applied to cotton seed when planted and gives good protection after the plant has emerged. It is also expected to have application in the treatment of ornamentals.

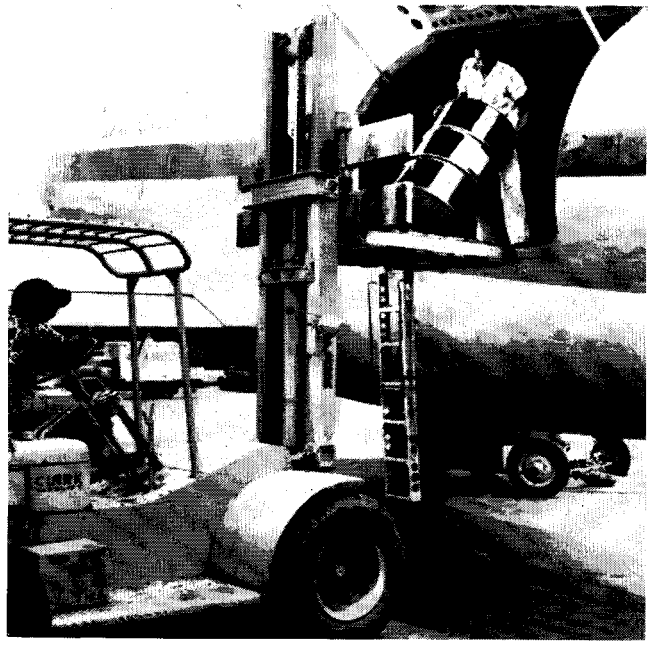
In the main, the older insecticides such as DDT and BHC have been holding their own, despite the growing acceptance of the newer pesticides. This has been possible through the expanding market for pesticides generally. DDT continues to enjoy an appreciable demand, although it is being replaced by malathion and other newer chemicals in fly control.

The New York State Agricultural Experiment Station recently announced that DDT is steadily losing its effectiveness against cabbage worms. Although this insecticide originally gave almost complete control, it is now of doubtful value in New York cabbage fields, says the experiment station.

Today, use of BHC is being limited mainly to control of cotton insects. Demand for this insecticide has declined in areas where soil contamination is a problem. Heptachlor, endrin, and dieldrin are making appreciable headway in cotton areas.

Malathion by Air

In early August American Cyanamid's malathion plant in New Jersey started filling rush orders for air shipment of the pesticide to Western Canada. The biggest aphid infestation in five years was



Malathion receives rush call to help control aphid infestation in Western Canada. Chartered plane hurried the pesticide to blighted areas

spreading over Canada's prairie crop lands. Concentrated technical grades were flown to formulators in Winnipeg, Burlington, and Montreal. Air shipments were then arranged for moving the formulated product to the western provinces. There much of the malathion field application was done by air.

The sucking aphid thrives in hot humid weather. Within a few weeks it spread over 300,000 acres in Manitoba and Saskatchewan and later into Alberta. Late seeded barley was hardest hit. Canadian supplies of malathion were rapidly depleted and hence the rush orders for air shipments.

Old Line Products Still Move in Large Volume in South; Systemics, Mixtures Gain Ground

DECLINING FARM INCOME hasn't hurt sales of agricultural chemicals in the South to any great extent. Most of the pesticide consumption is still out of necessity; the volume used has been determined more by acreages planted, and by the severity of insect infestations, than by farm income. Reduced income causes farmers to delay their purchases, hoping they will not need any pesticides. Some farmers are forced to buy materials at the last minute at higher prices, with the risk that materials will not be available. If the downward trend in income continues, it is bound to reflect on sales eventually.

Consignment selling continued through this season. Several basic producers are withdrawing from the DDT and BHC market because of low profits caused by price cutting and consignment selling. It just isn't feasible for a manufacturer of basic materials to take all the risks for the formulators, dealers, and farmers in the application of insecticides. This may have been possible when profit margins were high, but on the slim margin of today's business, such practice is economic suicide.

DDT and BHC Still Popular

Sales of BHC and DDT in the Southwest this year have been good—better than some producers expected. But profit margins are still slim because of low prices. One manufacturer who specializes only in these materials says his volume of business has increased substantially over the past two years.

Farmers in the Southeast are still using large quantities of BHC and DDT. Newer products are coming in, but at somewhat higher prices. A growing appreciation of the need for insecticides has in general sustained DDT and BHC markets. Although new materials are being used extensively, their consumption is in addition to the older materials, rather than as substitutes. DDT, BHC, aldrin, and dieldrin are still being used almost as much as ever on cotton in the Midsouth.

DDT has lost ground in the control of houseflies and fleas to newer materials like malathion.

Georgia reports indicate some loss of DDT and BHC markets to dieldrin, endrin, parathion, and heptachlor. BHC is losing a considerable amount of its tonnage on cotton in the South Carolina tobacco area. It adversely affects flue-cured tobacco grown on land formerly planted with BHC-treated cotton. (Endrin is gaining ground this season as a tobacco insecticide due to outbreaks of the cabbage looper.)

Extension workers say seed treatment in some areas of South Carolina has been used to control seed corn maggot on beans, cotton, and corn and sand wireworm on cotton and corn. A Clemson Agricultural College survey disclosed that lindane was used on seed to plant approximately 25,000 acres of cotton and corn during 1954. South Carolina's campaign to control roaches will increase the consumption of materials like chlordan and dieldrin, they say.

Systemics Gain Ground

In Georgia and Tennessee, systemic insecticides have reached a more important position commercially. Materials like dematon are being used considerably in the Midsouth for control of spider mite and aphid on cotton. The State Plant Board of Mississippi has found that some of the systemics hold great promise for the control of insects on ornamentals. They predict a bright future for insecticides of this type.

Systemics are definitely being used more extensively in Florida, especially on ornamentals. Some authorities in Florida believe that systemics are also being used widely in the control of mites on clovers. To the best of their knowledge, the application of systemics to vegetable crops is still in the experimental stage.

Application of systemics in South Carolina has definitely reached the development stage. Agricultural workers say dematon as a spray looks promising for the control of red spiders. If dry weather comes, and if spider mite populations increase appreciably on cotton, these factors will boost consumption of systemics. The experiment station at Clemson reports excellent test results with systemics in the seed treatment of cotton. A survey conducted by county agents, experiment station entomologists, the extension cotton committee, and com-

A North Carolina tobacco farmer tried D-D, Shell's soil fumigant, to control nematodes. At left is untreated plot. Plot at right shows effects of D-D. Inserts are roots from untreated and treated areas