mercial workers indicates a strong demand for systemics in future years—when approval is given and when supplies are available.

Pesticide Mixtures Move Up

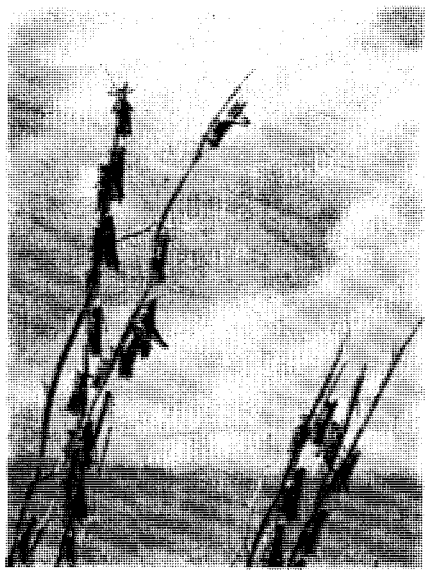
A large increase in the use of pesticide-fertilizer mixtures has been reported from Georgia, a small gain in Tennessee, and practically no increase in Florida. Mississippi is consuming only a small quantity of mixtures; the Mississippi State Plant Board is now preparing regulations for labeling of these products. Board officials expect to be registering such mixtures in the near future.

South Carolina has pioneered in the use of insecticide-fertilizer mixtures. Clemson College specialists point out that since 1948, when insecticides were first used to control the sand wireworm, there has been considerable expansion in the use of insecticide-fertilizer mixtures. Combined totals of annual surveys show that more than a half million acres of crop land have been treated. Usage reached a high point last year when more than 100,000 acres were treated.

However, all soil insect control has not been by means of insecticide-fertilizer mixtures. Large amounts of granular insecticides have been applied, especially for control of the white-fringed beetle—as part of federal-state programs directed by the Crop Pest Commission at Clemson College. Insecticide dusts, and sprays are also popular in South Carolina. Parathion, for example, is being used on tobacco plant beds as a dust, spray, and drench to control white grubs.

South Carolina farmers, since 1948, have used insecticide-fertilizer mixtures on about 100,000 acres of corn to control sand wireworm, southern corn rootworm, and seed corn maggot; on more than 5000 acres of Irish potatoes to control wireworms; on 1000 acres of sweet potatoes to control wireworms and elongate flea beetles; on 1000 acres of snap beans to control seed corn maggot; and on 1200 acres of pastures to control white grubs. Unknown acreages of cotton have been treated for sand wireworm.

Mixtures have been especially effective in the coastal area in the control of mole crickets. College entomologists say the use of mixtures on lawns to control white grubs is increasing; ground moles apparently tend to go to other areas when the white grubs are killed. Little, if any, of the insecticide-fertilizer mixtures have been used to control the Japanese beetle, an insect now invading the state. But experts believe the larvae of this insect, a white grub that damages sods, can be controlled with mixtures. The greatest recent increase in South Carolina is taking place with the application of mixtures, particularly those containing aldrin, heptachlor, and chlordan, on sweet potatoes.



Nearly 2 million acres of grasshopper-infested rangeland in Texas, Oklahoma, and New Mexico were sprayed in cooperative project between Government and ranchers

Florida Experiment Station entomologists and plant pathologists have for the most part discouraged the practice of mixing pesticides with fertilizers. The industry itself has been reluctant to mix pesticides with fertilizers. Hence, the use of such combinations has remained at a low level. It is possible that the simultaneous but separate application of pesticides and fertilizers is being practiced to some extent, but certainly not on a large scale. Georgia officials report very little progress in simultaneous but separate applications; Tennessee authorities say some progress is being made in this direction. South Carolina workers have research projects under way, using separate applications, in the control of billbugs and lesser cornstalk borers, and in the control of plant pathogens affecting cotton and beans. Application of pesticides as seed treatments is frequently practiced at the same time fertilizer is being applied, they say, which also includes fungicides and insecticides.

Marketing Practices Essentially Unchanged

Little or no change has taken place in the pattern of marketing pesticides throughout the South, although there has been some increase in the amount of promotional effort by certain producers of exclusive products. Due to the Miller Bill, farmers have become more aware of toxicity problems. They seem to want to do the right thing, but just don't know how to go about it for lack of sufficient information.

Producers and distributors in the Southeast are tending toward better business practices. Many who have not used sound practices in the past have been forced out of business; others are realizing that unless they make some money they will soon be on the way out. There is still room for improvement. However, price cutting is still prevalent in the Rio Grande Valley of Texas, except in some isolated spots.

Weed killer sales are possibly ahead of the past two years in the Southeast, although there was very little, if any, increase in chemical weed control of cotton. Lack of interest in chemical weed control has been prompted by three dry growing seasons and by a reduction in cotton acreage.

Early use of insecticides in the Southeast was equal to or slightly ahead of the past two years, due primarily to a cool spring which favored thrips on cotton. Boll weevils are not as numerous as they were three years ago, although populations may eventually run higher this season than last. If weevil populations continue to climb, cotton poison usage may equal or surpass that of last year in spite of reduced acreages. Some industry leaders say this year will go down in history as slightly better in pesticide sales than in the past two years, so far as the Southeast is concerned.

Grasshoppers, Corn Borers Give Trouble In Midwest; Armyworms Lighter

THE INSECTICIDE BUSINESS was generally better in the Midwest this season than it was last year. Infestations of grasshoppers, centering in Missouri and Kansas, and of European corn borer in the Corn Belt were the most serious outbreaks. Sales in Minnesota compared favorably with those of two years ago, but the area was spared the severe outbreak of armyworms which it suffered last year. Wet weather in the Red River Valley in North Dakota and Minnesota and poor price prospects, especially for potatoes, were blamed by one formulator for poor business in that area. However, almost all reports from other parts of the Midwest mentioned improved sales, at least volumewise.

Price cutting and consignment continue to be the subject of much complaint. Neither practice seems to be lessening. There is some indication that consignment is getting worse. One formulator states that all the major com-

panies now sell on this basis, and more and more medium-sized and small companies are adopting the policy all the time.

Lowered farm income does not appear to have had any appreciable effect on insecticide sales, although in some cases it has brought about delayed buying. The necessity of insecticide application is all too apparent to the farmer. Farmers are showing some slight tendency to regard insecticides as crop insurance, so the insecticide business is reported to be a little steadier this year by some manufacturers. Nevertheless, individual infestations remain powerful factors in determining markets.

Grasshoppers and Corn Borers

Grasshopper infestations, in Missouri and Kansas especially, contributed to the insecticide sales in those areas. One Missouri formulator declared business this year was "the best ever." Most grasshopper control recommendations called for aldrin, dieldrin, toxaphene, heptachlor, or chlordan, but DDT was specified as an alternate when these were not available.

Adequate rainfall in July helped keep grasshoppers from becoming any worse than they had been, but excessive heat in early August did not help the situation. Alfalfa, clover, soybeans, and garden crops suffered severe damage in Missouri. Cool weather and rain did not seem to slow down grasshoppers very much in Nebraska. Some corn damage was reported there.

Unseasonably warm weather in May gave the European corn borer a good start in the big corn producing states. Cooler weather in June helped somewhat. DDT was almost the only insecticide recommended by the experiment stations. During June there was much more spraying of corn in Iowa than there was last year. In Illinois infestation became much more serious than first predicted. As it eventually turned out, 1 to 5% of the total corn acreage in the state needed spraying, and in some areas 15% needed control measures. Illinois was threatened with potentially the largest second generation of this pest ever observed there.

In Indiana, and to some extent Ohio, the Hessian fly made an appearance as a serious pest for the first time in many years. This insect is ordinarily controlled by crop cultivation practices, however, and not insecticides. Excessive volunteer wheat was blamed. A surprise outbreak of slugs occurred in Ohio, but they too had little effect on pesticide sales, since there was a lack of any cheap material available, and too little is known about the effect of common insecticides on these creatures.

Armyworms, which caused so much damage in Minnesota last year, were not very dangerous this year, although toxaphene movement for their control was good. Malathion sales for aphids were also fair in Minnesota this year. One formulator said his insecticide sales were roughly 10% below last year.

Soil Treatment Increases

Soil treatment with insecticides appears to be increasing. Pesticide-fertilizer mixtures continue to grow in use in certain areas. Iowa is the center of this practice. An Iowa experiment station survey to which 37 counties responded counted 181,500 acres of corn treated before planting, 247,500 acres treated by mixing insecticides with starter fertilizer, and 32,050 acres of corn treated by some other method of soil application.

A tremendous future is expected for soil fumigants. Big markets are presently for Florida vegetables, but use in some parts of the Midwest is expected to increase. The tougher grain sanitation program is also increasing sales of grain protectants. Rodents, however, not insects, have been responsible for most of the grain seizures so far.

The distribution of types of insecticides used appears to be fairly stable. DDT remains almost as important as ever, even though its use in fly control has decreased sharply. BHC has lost out to some of the newer insecticides more than DDT has. In connection with development of resistant strains, it is interesting to note that the action of insecticides in greenhouses often gives an indication of later performance in the field. Resistance of certain pests to parathion was observed in greenhouses two years before it appeared in orchards. Concentrated application in greenhouses speeds up development of resistant strains—and, incidentally, makes this specialty market an excellent one for insecticides.

A few farmers have tried 2,4-D-insecticide combinations on corn, although the practice is not usually recommended. The combination is not very logical, since the insecticide should go on the corn, and the weed killer on the ground or on weeds between rows. Combinations may be useful in treating fence rows, however.

Iowa State has been carrying on some work with granular DDT, but various difficulties have caused them to withhold recommendation. There have been some successful results reported in Iowa and Nebraska.

Systemics have shown fantastic results on potatoes and beans in Michigan as far as effectiveness is concerned, but toxicity still has to be considered. Toxicity is a matter of great interest these days. While the Miller Bill is almost universally welcome, confusion reigns in the matter of its effects on individuals. In many cases, such as perishable garden crops which are not held up for inspection, it seems that it will be almost impossible to enforce residue tolerance requirements.

Rig being used experimentally at Michigan State University for application of fertilizer and insecticides at same time

Herbicide Use Is Up

Volume of weed killer sales has been high this year over most of the Midwest, but low prices have cut deeply into profits. Prices have been off 8 to 10% in some lines. A Minnesota formulator reports 2,4-D and TCA sales up about 15 to 20% over last year, and weed killer sales 20 to 25% over 1953.

Small grains and corn continue to take up most of the herbicide business, but a large potential may be found in vegetable crops. Workers at Michigan State are experimenting with chemical weed control for the intensively cultivated truck garden areas of the state. This type of farming with its large labor requirements may adapt itself well to herbicide use.