

NEW WORLD

A Special Case for DDT Treatment?

by our Washington Correspondent

In the past few years, bewhiskered caterpillars of the Douglas fir tussock moth have been quietly munching their way through nearly a million acres of fir forests in the north-western United States. The moth suddenly began a population boom in 1971, defied all predictions that the outbreak would end this year from natural causes, and is about to present the Environmental Protection Agency (EPA) with a serious dilemma. Should the ban on DDT, which was imposed last year after a long and bitter debate, be temporarily lifted so that the caterpillars can be sprayed when they hatch next spring? Last week, while American troops were on alert around the world and a domestic crisis was gripping the United States, a subcommittee of the House Agriculture Committee took time to hear about the caterpillars.

The moth is always present in the Pacific North-West, but it is usually relatively untroublesome, existing in small numbers in balance with its natural predators. Every so often, however, for reasons that have never been adequately explained, the moth undergoes an explosive population growth. Usually the epidemic suddenly ends in the third year, when the caterpillars all die off from a virus infection which spreads through the eggs during the winter months, and these periods of heavy infestation are then followed by several years of relative quiet. This time the moth refused to follow its traditional three-year cycle. According to the Forest Service, at the last count the insect had defoliated to some degree 657,000 acres in Oregon and Washington State and another 125,000 acres in Idaho. The committee was told last week that as many as 1.5 million acres of forests could be stripped next year if the infestation is not checked. The foresters in the area and the lumber companies that make their living from the trees want to kill the insects when they hatch next spring with the only pesticide they know will do the job—DDT. This does not appeal to environmentalist organisations which fought long and hard to get DDT banned, or the EPA which is understandably reluctant to allow use of a pesticide which it banned only a year ago amid a blast of publicity and a barrage of complaints from farmers, pesticide manufacturers and some scientists. The choice is, however, not

simply a matter of DDT or no DDT, and it is greatly complicated by the moth's failure during the past year to conform to its previous population trends.

To appreciate the basis of the EPA's dilemma, a little knowledge of the life cycle of the moth is required. Tiny tussock moth caterpillars hatch over a period of about a month in late May and early June from eggs laid during late August and September. The caterpillars go through five to seven moults, increasing in size as they eat first all the new foliage growth and then old foliage; they pupate in August and emerge in 10 to 18 days as adult moths. The female moth is wingless and mating takes place on the cocoon; she lays some 200 eggs in a mass and dies within a few weeks. The eggs remain on the trees during the winter and hatch in the spring. Thus, if the caterpillars are to be attacked with a pesticide, the application must come just as they first emerge, before they have had chance to start munching the foliage, and the pesticide should ideally remain active for a month or so to kill caterpillars that hatch late.

When a population explosion takes place, it usually goes undetected during

the first year, but becomes painfully obvious when caterpillars start stripping the trees in the second year. If left alone, the outbreak tends to end abruptly in the spring of the third year, because of the explosive spread of a nuclear polyhedrosis virus which kills off some of the caterpillars at the end of their first moult (instar). The infection spreads because the dying larvae infect foliage which is eaten by other caterpillars during their second instar, and so on—it is calculated that if 10% of the caterpillars are infected during their first instar, the entire population will be virtually wiped out by the end of June.

The problem is, however, that although the virus infection kills off the outbreak abruptly, it does not complete its work until a fair proportion of the caterpillars have survived long enough to munch foliage, and trees are still stripped even in the third year of an outbreak. The usual practice has thus been to spray infested trees with DDT in the spring of the third year of an outbreak but that was stopped in 1969, when the Department of Agriculture (the EPA was not then formed) banned the use of DDT on forest land.

The present outbreak began in 1971, and, by rights, should have ended

BOLL WEEVIL

An End in Sight

by our Washington Correspondent

WHILE a verbal battle was taking place in Washington last week over the use of DDT (see accompanying story), the US Department of Agriculture announced that it has successfully completed a programme which proves that it is technically possible to eradicate the boll weevil in the United States. One of the most destructive insect pests in the cotton fields, the boll weevil is now attacked with more insecticide than any other pest, and its elimination could save cotton farmers up to \$200 million a year in lost production.

The Department of Agriculture's announcement was based on the results of a two-year study of the use of integrated pest management techniques in a 5,000 square mile area in Mississippi, Alabama and Louisiana. The experiment involved the application of pesticides, the use of sex pheromones and, finally, the release of large numbers of sterile male insects. First, several limited pesticide applications were made in late

autumn to kill the last generation of weevils to reproduce that year, and to reduce the population which was due to hibernate during the winter. Then, in the spring, male sex pheromones were used to bait traps in and around the cotton fields (the boll weevil is one of the few species of insects where the male, and not the female, produces sex attractants). Finally, sterile males were released in the cotton fields in numbers far greater than those of the males that had survived the onslaught of pesticides the previous autumn.

Surveys conducted at the end of the second year of the experiment indicated that there was no evidence of boll weevils in 235 of the 236 cotton fields in the core of the experimental area. It should be pointed out, however, that it will be several years before the weevil can be eradicated by these techniques, because a national elimination plan must be formulated and approved by all the parties involved. Nevertheless, the experiment has raised hopes that one of the most destructive pests in the United States may at last be on the way out.