

CONTROL of INSECTS and DISEASES of PEANUTS

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The most destructive insects that attack above-ground portions of peanuts during the growing season are thrips, leafhoppers, and leaf-eating worms. The leaf-spots are by far the most important diseases of the growing plants. These insects and diseases can be controlled with chemical dusts (insecticides and fungicides). Profits that result from a dusting program depend upon the yield of peanuts, market price that prevails, cost of production, and amount of insect or disease damage that is present.

The tests reported here were done at the Wiregrass Substation in the years 1945-1948. Yields of peanuts at this Substation have consistently been above 1,000 pounds per acre. On land that yields less than one-half ton per acre, other practices may be more profitable than dusting. Some of these practices are: crop rotation, including use of winter cover crops; application of commercial fertilizer; and planting plenty of good seed. After these things have been done, control of insects and diseases will be profitable.

THRIPS

A disorder of peanuts commonly called 'possum-ears' often appears in the early spring. The trouble

is caused by very small insects called thrips. These insects feed in the buds and folded leaflets, rasp the surface of the leaves, and cause them to appear scarred or distorted. Thrips are barely visible to the naked eye. The adults are dark in color and measure approximately 1/25 inch long. The young are yellowish and somewhat smaller than the adults. When disturbed, they move quickly with a jumping or hopping motion. Thrips breed on volunteer peanuts that emerge ahead of the main crop, and then migrate from those plants to the young plants of the regular crop. Heavily infested peanuts may be severely stunted.

Experiments performed during the past 2 years have shown that thrips can be controlled with 5 per cent DDT or 10 per cent toxaphene applied at the rate of 20 to 25 pounds per acre. Yield increases from the use of either of these materials have varied from nothing to 92 pounds per acre. The data are not conclusive. At present they do not justify recommendations for thrips control. If dust is applied, make two applications 7 to 10 days apart. Start dusting when damage appears.

LEAFHOPPERS

Fields of peanuts that are

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heavily infested with leafhoppers are yellowish in appearance. This condition is sometimes mistaken for leafspot damage. Leafhoppers are small, greenish insects about 1/8 inch long. Both young and adults suck the juices from the peanut leaves and cause the tips to turn yellow and then brown.

Experiments during the past 2 years have shown that leafhoppers on Spanish and runner peanuts can be controlled profitably. Average gains resulting from dusting Spanish peanuts for hopper control have varied from 182 to 467 pounds per acre. Gains resulting from dusting runner peanuts for leafhopper control have ranged from 220 to 505 pounds per acre. These gains occurred in undusted fields yielding from 1,200 to over 2,000 pounds of peanuts per acre.

Four applications of 2.5 per cent DDT dust or 10 per cent toxaphene dust were effective in controlling the leafhopper on peanuts. The dusts were applied at the rate of 20 to 25 pounds per acre per application. The first dusting was made approximately 8 weeks prior to the estimated time of harvest, and three additional applications were made at 7- to 10-day intervals. In these experiments, net profits of \$8.20 to \$40.50 per acre resulted from the use of four applications of dust on peanuts for control of leafhopper.

LEAFSPOTS

Two separate leafspots attack peanuts. One of them is an early-season leafspot and the other is a late-season disease. The early leafspot usually appears in July, or earlier, on both Spanish and runners. The late-season form usually does not appear until some time in September after most of the Spanish peanuts have been harvested. The same control measures are effective against both diseases.

Several fungicidal treatments have been tested for control of peanut leafspot. Only dusting sulfur or dusting sulfur containing 3.4 per cent metallic copper are worthy of consideration. Other treatments have been found to be ineffective or too expensive.

During 4 years of experimental work, the increases in yields from sulfur dust or sulfur-copper dust on Spanish peanuts have varied from 50 pounds to 472 pounds per acre. During the same period, the increases on runners have varied from 108 pounds to 1,150 pounds per acre. The average increase from sulfur dust has been about 150 pounds per acre, while average increase from sulfur-copper dust has been about 100 pounds more or 250 pounds per acre.

Sulfur-copper dust cost almost three times as much as dusting sulfur; the cost of application for the two materials is the same. At present prices, the cost per acre for a dusting program using sulfur is about \$6 for materials and application. If sulfur-copper dust is used, the cost is approximately \$10 per acre. Thus, the additional 100 pounds of peanuts resulting from the use of sulfur-copper dust would cost \$4. In those years when leafspot is destructive, extra profits from sulfur-copper dust are even greater.

To be effective, the fungicide must be on the plants during the time the crop is being set and matured. In southern Alabama, this period usually falls between July 15 and September 1 on runner peanuts and a little earlier on Spanish.

The fungicides should be applied at about 10-day intervals because the dust becomes ineffective in a little less than 2 weeks. The first dust should be applied about the time of the last cultivation.

The last application should go on one month before harvest. Such a schedule usually will require four applications of dust on runners and at least three applications on Spanish. Each application will require 20 to 25 pounds of dust per acre. If any application is to be omitted, it should be the first one.

Tests have been made during the last 2 years to measure the return from one, two, three, and four applications of sulfur-copper dust on runner peanuts. The average increase from one application during this period was 374 pounds per acre. Two applications produced 477 pounds per acre increase. The increase from three applications was 538 pounds per acre, and from four applications it was 705 pounds per acre.

COMBINATION DUSTS for CONTROL of DISEASES and INSECTS

For the past 2 years, experiments have been conducted on the control of leafspot and leafhopper by using combination fungicidal-insecticidal dusts. Recommended mixtures contain 3.4 per cent copper and at least 65 per cent sulfur blended with 2.5 per cent DDT or with 10 per cent toxaphene. Sulfur may be used as the fungicide in place of sulfur-copper dust. However, the fungicidal value of sulfur is not as high as that of sulfur-copper.

The use of these mixed dusts has resulted consistently in higher yields of peanuts than those obtained from the use of either fungicides or insecticides alone. Increased yields of Spanish peanuts resulting from control of leafspot and leafhopper in one operation have varied from 449 to 467 pounds per acre. On runner peanuts the gains resulting from control of both pests in a single operation have varied from 369 to 1,389 pounds per acre. Net profits of \$20.90 to \$112.90 per acre re-

sulted from the control of leafspot and leafhopper in these experiments. These gains occurred in undusted fields producing from 1,200 to over 2,000 pounds of peanuts per acre. Profits from dusting are dependent upon the abundance of the pests to be controlled, yield and price of the peanuts, and other factors.

Four dustings with 2.5 per cent DDT in sulfur-copper or with 10 per cent toxaphene in sulfur-copper dust have given excellent results over a period of 2 years. Applications were made 7 to 10 days apart at the rate of 20 to 25 pounds per acre. The last dust was applied about a month before harvest. More information is available on the effectiveness of the DDT-sulfur-copper mixture than on the toxaphene-sulfur-copper mixture. It appears from limited data, however, that toxaphene is somewhat more effective than DDT. It is also more expensive. Either material will be satisfactory if applied properly.

Dusted peanuts retain their leaves longer than undusted peanuts, and it is possible that the increased value of the hay will pay for the cost of dusting. To obtain maximum benefits, digging should be delayed about 2 weeks after the usual time of harvesting undusted peanuts.

PEANUT WORMS

Two species of worms sometimes attack peanuts in the late summer and eat the leaves of the plants. One of these, the velvetbean caterpillar, is a greenish worm that wiggles vigorously when disturbed. It is commonly known as the peanut worm. The other insect, which eats the leaves of the peanut, is the fall armyworm. It attacks grasses, corn, grain sorghum, and other crops as well as peanuts. As a rule, it is darker in color than the velvetbean caterpillar and has three distinct

yellowish-white pin stripes running down the back from head to tail. This insect is much more difficult to kill than is the velvetbean caterpillar.

Experiments over a period of several years have shown that control of peanut worms is profitable. In the earliest experiments, it was found that peanuts defoliated late in the season by these insects lost several hundred pounds of peanuts per acre in the soil by shedding at harvest time. More recent experiments have shown that yield of peanuts may be reduced, even though the plants are not defoliated. Dusting to prevent severe ragging of foliage has resulted in increased yields of 300 to 600 pounds of peanuts per acre on land yielding about 1,600 pounds. Thus, dusting results in higher yields and prevents loss from shedding as a result of defoliation.

Preliminary investigations indicate that the dusting of peanuts with DDT or toxaphene in sulfur-copper for combined leafhopper-leafspot control during the summer months may greatly reduce or even eliminate the need for later dustings for the control of peanut worms. When control is necessary in less than 30 days of harvest the peanuts should be dusted with cryolite at the rate of at least 20 pounds per acre or with 5 per cent methoxychlor at the same rate. Methoxychlor may be mixed with sulfur or sulfur-copper. It is about as effective as cryolite against the velvetbean caterpillar but is less efficient against the fall armyworm.

RESIDUES ON HAY

There is still much concern over danger from residues on peanut hay fed to livestock. DDT remains on the foliage for a long time. When eaten by animals the insecticide is stored in the fat or passed in the milk. Children who drink milk from cows receiving DDT-treated hay store DDT in the fatty tissues of the body. The

evidence is that once the insecticide is stored in the body it remains there indefinitely. It continues to accumulate when additional food containing DDT is eaten, and over a long period considerable amounts are stored in the body. DDT can cause damage to liver tissues but the amount necessary to injure human beings has not been determined. The U. S. Food and Drug Administration has announced that **DDT WILL NOT BE PERMITTED IN MILK** and certain other foods. Where dairy cows are fed hay recently treated with DDT, the milk could be condemned and withheld from the market. Therefore, **DDT IS NOT RECOMMENDED FOR USE ON HAY CROPS THAT WILL BE HARVESTED WITHIN 30 DAYS AFTER BEING DUSTED.**

Toxaphene appears to be somewhat less hazardous than DDT from the standpoint of residues. When fed to animals, it is stored in the fatty tissues. However, it is not passed in the milk in such large amounts. After livestock are taken off feed containing toxaphene, part or all of the material is eliminated from the body. Until more information is available, this insecticide is not recommended for use on hay crops within 30 days of harvest.

Cryolite and methoxychlor appear to present no serious residue problem.

The best solution of the residue problem on peanuts is to return the vines to the land for soil-building. Experiments at the Wiregrass Substation show that 1,000 pounds of peanut hay per acre used as manure in a rotation increased the yield of seed cotton 200 to 300 pounds per acre the following season.* Where peanuts are picked from the windrow or from small piles with a tractor-drawn picker, the vines are left in the field. This practice is increasing in Alabama.

*Unpublished data, from Wiregrass Substation, Headland.