MINNESOTA FEEDSERVICE

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Control of Insects On Forage Crops

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There are farm practices which can help reduce insect losses on some forage crops. But the greatest reliance must be placed on insecticides.

Timing of alfalfa-cutting dates, for example, can help prevent losses from grasshoppers. Late cutting of the first alfalfa crop will help prevent leafhopper injury to the second—but the benefits must be weighed against the loss in quality resulting from late cutting.

The use of adapted varieties, recommended fertilizer practices, and proper timing of cutting or grazing help to establish and maintain healthy plants which can better tolerate insect damage and recover rapidly.

Insecticides, however, provide the principal means of control. In selecting the correct insecticide, three things must be considered:

1. Efficiency in controlling the insect pest.

2. Toxicity, in the case of alfalfa and related legumes, to honey bees and other pollinating insects. Apply only toxaphene or methoxychlor to crops in bloom, and then only at night when bees are not in the field. Keep in mind that sprays are less toxic to bees than dusts.

3. Residues which may be present on the forage crop in small amounts at time of harvest or when used as food by livestock. The residue problem may need some explanation.

When livestock feed on insecticide-treated forage, there is a possibility that traces of one of the persistent insecticides, such as DDT, may appear later in the milk or meat products. Sale of milk contaminated by insecticides is not permitted by the Food and Drug Administration. Therefore, some insecticides cannot be used at all directly on dairy animals. Certain others, if used on the animals or their forage, must be used only in small enough amounts so they will not appear in the milk.

Very small residues of 7 parts per million of DDT and 3 parts per million of methoxychlor are considered to be safe in the fat of meat. But no detectable amount of any insecticide is permissible in milk.

Soil or Surface-Feeding Insects

Armyworms and cutworms can be controlled with ½ pound per acre of heptachlor. Prepare the dosage by using 1 quart of the "2-lb." (2 pounds of the active ingredient per gallon) emulsifiable concentrate in sufficient water to spray 1 acre. (This is usually 5 to 30 gallons water by ground sprayer, 2 to 3 gallons by airplane.) A 10-day waiting period between time of application and harvest or pasture is necessary with the ½ pound heptachlor treatment.

Toxaphene at 1 to 1½ pounds actual toxaphene per acre is also effective, but must not be used within 40 days of grazing or harvesting the crop. Aldrin can also be used at ½ to ¾ pound actual aldrin per acre if applied at preplanting time.

Insects Attacking Foliage

Insects injuring the foliage of alfalfa and other forage legumes include grasshoppers, leafhoppers (especially the potato leafhopper), plant bugs (especially the tarnished and alfalfa plant bugs), and aphids (especially the pea aphid). The spotted alfalfa aphid is a threatening pest which occurs only on alfalfa.

Grasshoppers should be controlled in the spring, as soon as they become noticeably abundant and the hatching of nymphs appears to be complete. The effective and approved insecticides include heptachlor and malathion.

Heptachlor is recommended at 2 ounces actual insecticide per acre or ½ pint of the "2-lb." emulsifiable concentrate. With malathion, 1½ pints of the "5-lb." emulsifiable concentrate is recommended. These concentrates need to be diluted with the quantities of water suggested above for armyworms and cutworms.

Doses of both insecticides need to be increased to control late-stage nymphs and adult grasshoppers. The amount of heptachlor should be increased to ¾ or 1 pint of the "2-lb." emulsifiable concentrate, while 2 pints of the "5-lb." emulsifiable malathion is desirable for each acre.

A 7-day waiting period between application and harvest must be observed when either heptachlor or malathion is used.

Grasshoppers may become abundant just before a hay crop is ready for harvest. A wise procedure then is to make the cutting, remove the hay from the fields as soon as possible, and promptly treat the stand with insecticide. Chopping the crop for silage would permit an earlier application of insecticides than is possible with other methods of harvest.

The potato leafhopper frequently causes severe yellowing and stunting of alfalfa in southern Minnesota and reduces yields and quality. Control on the

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Should Oats Be Fed As Silage or Grain?

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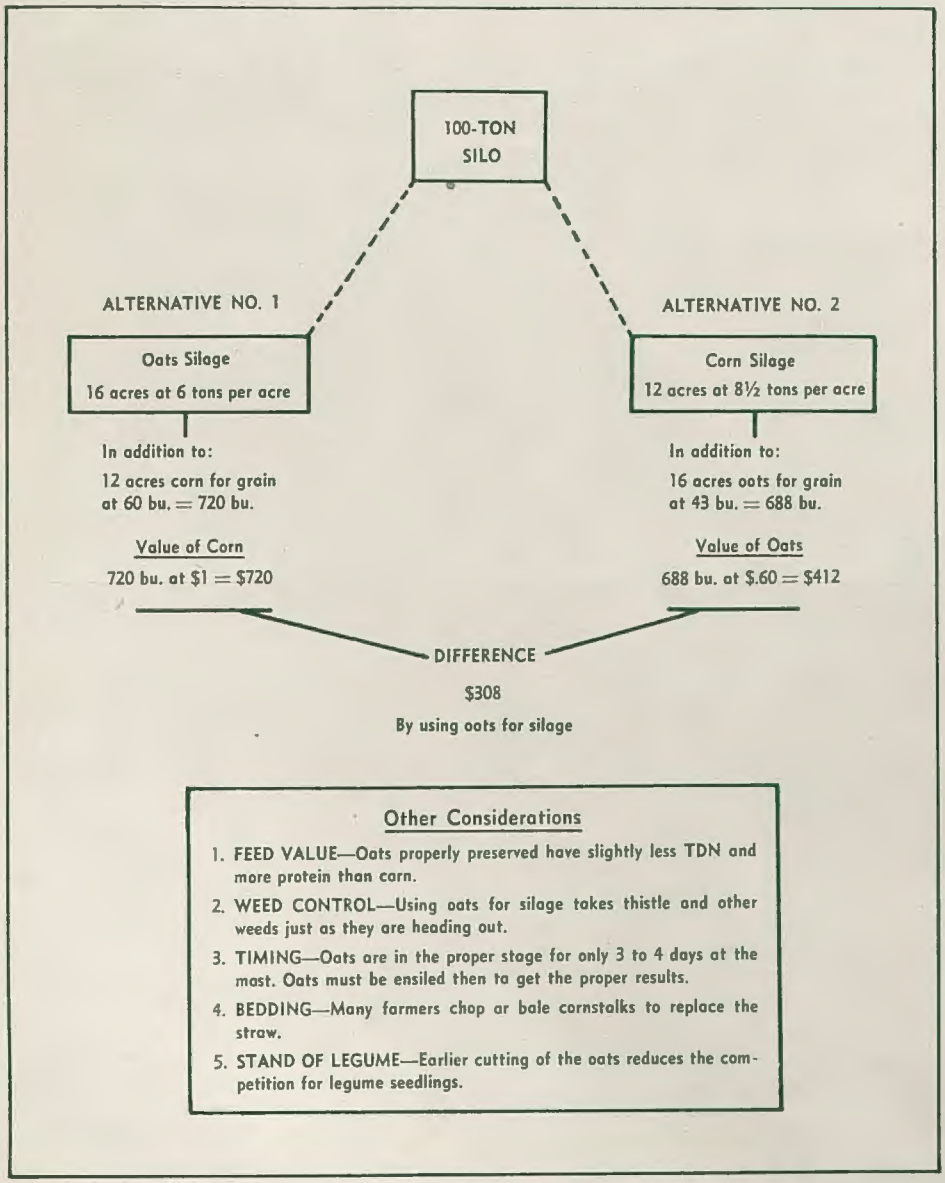
Minnesota farmers feed most of the crops they grow on their farms. They have a choice as to the form in which they feed it, however. They also have some choice as to types of livestock to feed. This decision is complex; it must consider the effect on the entire farm organization. One way to do this is to describe the differences between the possible alternatives, and weigh the differences.

Farmers generally keep some cattle or sheep to use the legume-grass crops. Feeding is the best outlet for these crops, since the cash market frequently is limited.

When additional forage supplies are needed, farmers generally use corn silage. In recent years there has been interest in using oats for silage. This will enable them to husk the corn that formerly went into the silo.

Oats or Corn Silage?

One way to decide is to compare the alternatives of filling the silo with oats or with corn. Assume a farmer has a 100-ton silo and grows both oats and corn. He has 2 choices: (1) fill the silo with oats and take the corn for grain or (2) fill the silo with corn and take the oats for grain. The chart shows how the two alternatives compare.



On the farm covered in our chart it would be more profitable to use oats for silage and harvest the corn. This may not be true for all farms. Their yield and the prices of the crops may be different. However, other farmers may use the same method for analysis, substituting yields, acres, and prices that fit their conditions.

Now that the farmer has used this comparison of alternatives to decide that he should use his oats for silage and harvest his corn for grain, he can use the same method of analysis to answer the next question. Should he harvest his oats as silage, or would it be more profitable to harvest it as grain?

Silage or Grain?

Assume that this farmer uses this oats silage to fatten steer calves. He buys the calves at 400 pounds and sells them at 950 pounds. He feeds 1.5 tons oats silage, 0.5 ton alfalfa-brome, 0.4 acres alfalfa-brome pasture, 45 bushels corn, and 150 pounds supplement per head. The 100 tons of silage is enough to fatten 66 calves. The total amount of feed used for these 66 calves is shown in Alternative 1 in the table on the facing page.

Another alternative is to cut the oats for grain and feed it to hogs. This alternative will give him less forage; he will have the hay and pasture but no silage. The number of steers will have to be cut from 66 to 50. The total amount of feed that will be used by the 50 steers is described in Alternative 2.

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This alternative gives 680 bushels of oats. In addition, cutting steers down to 50 released 470 bushels of corn. This is enough feed to raise 54 hogs, using 15 bushels corn or its equivalent in oats per hog.

The full description of these alternatives follows in tabular form.

Alternative No. 1			Alternative No. 2		
OATS FOR SILAGE 16 acres at 6 tons per acre = 100 tons Feed 66 head of feeder calves			OATS FOR GRAIN 16 acres at 45 bu. = 680 bu. Feed 50 head of feeder calves		
Feed required	Per head	Total	Feed required	Per head	Total
Oat silage	1.5 tons	100 tons	Grass silage	1.5 tons	75 tons
Alfalfa—brome hay	0.5 ton	33 tons	Alfalfa—brome hay	0.5 ton	25 tons
Corn	45 bu.	2,970 bu.	Corn	50 bu.	2,500 bu.
Pasture	0.4 acre	26 acres	Pasture	0.4 acre	20 acres
Supplement	150 lbs.	660 lbs.	Supplement	150 lbs.	2,500 lbs.
			Extra Feed		
			Corn		470 bu.
			Oats		680 bu.
			54 extra hogs at 225 lbs.		
Income realized:			Income realized:		
66 feeders (950 lbs.) $20		$12,540	50 feeders (950 lbs.) $20		$ 9,500
			54 hogs (225 lbs.) $16		2,040
					$11,540
Less expenses for:			Less expenses for:		
66 feeders (400 lbs.) $18		4,752	50 feeders (400 lbs.) $18		3,600
Supplement 6,600 lbs. $5		330	Supplement—		
Cost of silage harvesting (over combining)		100	Feeders (2,500 lbs.) $5		125
			Hogs (5,940 lbs.) $5		297
		$5,182			$4,012
Adjusted Income		$6,358	Adjusted Income		$7,528

Other Considerations

For this farmer, under the conditions and prices indicated, it would be more profitable to take the oats crop for grain and feed it to hogs and 50 feeders than take it for silage and feed to 66 feeders and no hogs.

The decisions given above apply to this farmer. Others may find their answers to be different. However, they can use the same procedure for the analysis, substituting the figures that apply to their farm. In fact, this method is the soundest basis for making the complex decisions that farmers face.

Don't Use Treated Seed In Poultry Rations!

This year will be a difficult one for many poultrymen to hurdle economically, because of decreased egg and meat prices. In an effort to save on feed costs, it may be tempting to some to use leftover or otherwise available seed grain for feeding purposes. This may be especially true in areas where much corn is grown. This general practice is very dangerous, however, and should be avoided.

Seed corn treated with Arasan, for example, is especially hazardous in poultry rations. Research in the University of Minnesota Poultry Department has established that Arasan is extremely toxic to young and old chickens alike. Indeed, dietary levels of Arasan in poultry rations which comprise less than 10 percent of the levels found on treated seed corn produce poor growth and leg weakness in chicks and decreased egg production an soft-shelled eggs in hens.

It is probable that during the last ten years or so, the poultry industry has suffered much loss due to the unrecognized usage of Arasan-treated seed corn. Because the symptoms produced by the Arasan resembled those of known nutritional and pathological symptoms, the known conditions were probably incorrectly diagnosed in many cases.

—P. E. Waibel, Assistant Professor of Poultry

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first hay crop usually is not necessary. But the second and third crops should be treated when plants are 6 to 10 inches tall, or when leafhoppers reach an abundance of three or more per sweep of a 12-inch insect net.

Treatment with 1 to 1½ pounds of actual methoxychlor per acre gives the best control. For ground equipment, 2 to 3 pounds of 50% wettable powder or 2 to 3 quarts of the "2-lb." emulsifiable concentrate may be used in 30 to 50 gallons of water per acre.

For airplane application, 3 quarts of the "2-lb." emulsifiable concentrate may be used in 2 to 3 gallons of water per acre. The waiting period between application and harvest or pasturing is 7 days no matter how methoxychlor is applied. While DDT is also effective, it is not recommended because of the possibility of contamination of milk.

Plant bugs, when numerous, stunt the plants and reduce forage yields. The blasting of flower buds by plant bugs makes them far more important pests of legumes grown for seed than of those grown for forage.

Control is justified on forages if the plant bugs reach an abundance of three per sweep of a 12-inch insect net Methoxychlor alone is erratic in controlling plant bugs. Therefore, a combination of it as used for leafhoppers and malathion as used for aphids is suggested.

The pea aphid usually does not become abundant enough on forage legumes to require control.

The spotted alfalfa aphid, a new pest, may become serious in Minnesota. Last fall this aphid was found in non-economic numbers in 12 southwestern Minnesota counties. It has spread rapidly from the southwestern United States to eastern and northern states.

It multiplies rapidly during the summer and has a habit of secreting sticky "honeydew" on the leaves and stems, which are soon invaded by a black, sooty fungus. As a result, the quality of alfalfa hay is seriously reduced, including a reduction in the protein and carotene content. Heavy infestations may result in complete loss of the crop.

According to our present information, the spotted alfalfa aphid probably will be most injurious, under Minnesota conditions, to the second or third crop of alfalfa.

Chemical control may be accomplished by prompt application of 1 pint

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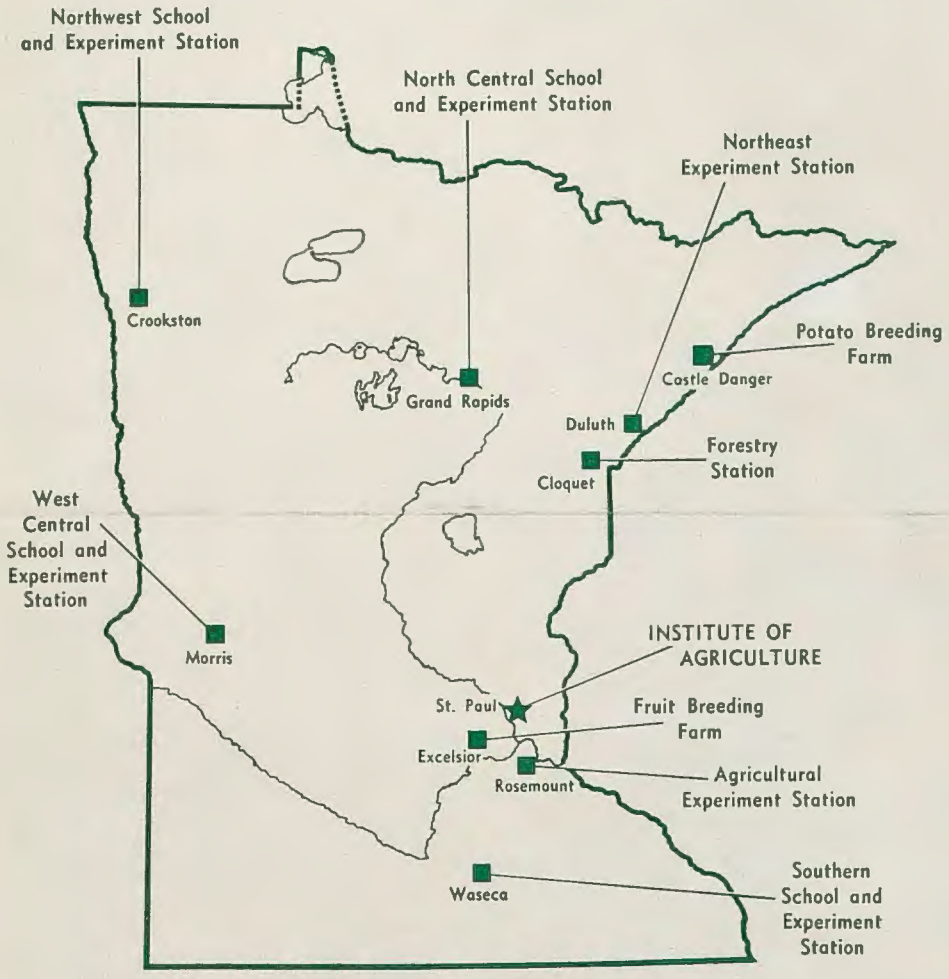

1957 Field Days Set

Dates for the 1957 field days at the branch stations of the University of Minnesota Agricultural Experiment Station have been announced by T. H. Fenske, associate dean of the Institute of Agriculture.

Purpose of the field days, held annually, is to give everyone interested a firsthand look at the experimental work being carried out in all areas of research vital to Minnesota's agricultural progress.

The University's top research men are scheduled to be on hand to answer questions and speak briefly on some of the projects now underway.

As in past years, the Extension Service will be cooperating closely with the Experiment Station in publicizing the field days and assisting in programs at the branch stations.

The field days will be held during July at these seven locations throughout the state:

July 3—ROSEMOUNT

July 8—SOUTHWESTERN MINNESOTA, Rushmore

July 9—WASECA

July 11—MORRIS

July 18—CROOKSTON

July 25—GRAND RAPIDS

July 26—DULUTH

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of "5-lb." emulsifiable malathion per acre by ground sprayers or 1¼ pint by airplane. These rates are about 10 and 12 ounces actual malathion per acre. There must be a 7-day waiting period between any application and harvest.

Malathion will also give some control of leafhoppers and plant bugs. But for good control of those insects, methoxychlor or the malathion-methoxychlor combination should be used.

Summing Up

The control of insects on forage crops appears to be a desirable, although somewhat neglected, phase of pest control. The full value of such control is likely to be appreciated in years when moisture is not quite adequate, when grasshoppers are abundant, when the potato leafhopper is abundant (most years in southern Minnesota), or perhaps when the spotted alfalfa aphid moves into the area.

Insecticides valuable for controlling insects on forage crops must be used so that contamination of milk or meat will not result. This can be done by (1) **using the recommended insecticide,** and (2) **observing the proper waiting period between application and harvest.**

Armyworm and cutworm control can be accomplished with heptachlor, aldrin, and toxaphene at the times recommended. Approved insecticides for control of grasshoppers on forage are heptachlor and malathion. Leafhoppers can be controlled with methoxychlor; aphids, with malathion. There is the possibility of combining methoxychlor and malathion for control of leafhoppers, aphids, plant bugs, and grasshoppers.

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