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Control of
Plant Bugs
in Northern Alfalfa Seed Fields

by H. McMAHON
J. C. ARRAND

SCIENCE SERVICE · ENTOMOLOGY DIVISION
DEPARTMENT OF AGRICULTURE

CONTROL OF PLANT BUGS IN NORTHERN ALFALFA SEED FIELDS[1]

by

H. McMahon and J. C. Arrand

Entomology Laboratory, Saskatoon, Sask.

Plant bugs, of one or more kinds, are present in every alfalfa field in the northern districts of Western Canada. They are most numerous in the smaller fields in districts where a large part of the land is still unbroken, that is, in the only fields where there are likely to be enough wild bees to pollinate enough flowers for worth-while seed yields. In such fields they reduce seed yields from 15 to 100 per cent if they are not controlled.

Plant bugs that injure alfalfa in northern districts include lygus bugs[2], *Plagiognathus* sp.[3], the alfalfa plant bug[4], and the rapid plant bug[5].

DAMAGE

You are not likely to notice these insects in the field because they are small and inconspicuous, but you can easily see and recognize the damage that they cause. In heavily infested fields it is very conspicuous.

The alfalfa may simply fail to bloom well; there may be very little bloom anywhere in a field; or there may be patches of well-flowered alfalfa intermixed with patches that show little or no bloom. If you examine the poorly flowered alfalfa, you will find that the buds have turned yellowish-white or gray and have failed to open. Such damage is commonly called bud-blasting. Some of these blasted buds fall, leaving short, bare flower stalks. The alfalfa may appear stunted.

The alfalfa may start to bloom well in late June or early July; seed pods may begin to appear; *but bloom and small seed pods begin to disappear after about mid July.* If you examine the alfalfa, you will find great numbers of bare flower stalks, sometimes called stripped racemes, from which buds, flowers, or small seed pods have fallen. Many of the remaining buds will be found blasted. Any seed that is harvested will contain numerous discolored and shrunken seeds. These are probably only a portion of the damaged seed; the most seriously damaged seeds are almost certain to be blown out during combining or threshing.

It is not only in the heavily infested fields, where damage is conspicuous, that seed yields are reduced appreciably. Even in lightly infested fields where there is abundant bloom you can find blasted buds and bare flower stalks, particu-

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[1] Superseding Processed Publication Series, Entomology, No. 67.

[2] Chiefly two undescribed species of *Lygus*.

[3] Believed to be an undescribed subspecies of *Plagiognathus obscurus* Uhler, with no common name.

[4] *Adelphocoris lineolatus* (Goeze).

[5] *Adelphocoris rapidus* (Say).

larly in late July and early August, and discolored, shrunken seeds in the harvested crop. Seed yields will be reduced 15 to 25 per cent or more in these fields if the bugs are not killed.

Do not confuse plant bug damage with frost damage or the effect of lack of pollination. Late-spring or early-summer frosts cause buds and flowers to drop, leaving bare flower stalks. Fall frost injures any seed that is still green, causing shrunken seed in the harvested crop. The flowers also fall, leaving bare flower stalks, if they are not tripped and cross-pollinated because of lack of bees, or because periods of rainy, cool weather prevent the bees from working. But the presence of *blasted buds* as well as bare flower stalks in the field, and discolored, shrunken seed in the seed pods or in the harvested crop, is certain evidence of plant bug damage.

All of this damage is caused when the bugs feed. They have sucking mouth parts, which are in the form of a beak. To obtain food they insert these into the buds, flowers, and green seed pods, and suck up the plant juices. It is believed that in doing so they inject substances that are poisonous to the plant, and that the damage is partly due to these and partly due to the puncturing of the plant tissue and removal of sap.

DISTRIBUTION AND DESCRIPTIONS

The damage is caused by the immature stages, or nymphs, and the adult bugs. If you sweep the alfalfa with an insect net, the bugs will be collected in the net where they can be seen readily.

Plagiognathus sp. has been found causing serious damage in numerous though scattered fields in northern Saskatchewan and Alberta. In some years these insects have been the most numerous and most harmful of the plant bugs in many fields.

The adult is a little more than an eighth of an inch long and about a third as wide. They are generally dark but have patches of lighter color. The nymphs are greenish except the very small, newly hatched nymphs, which are pale yellow.

The *alfalfa plant bug* was first found in economic numbers in Saskatchewan in 1952, though it has been an important pest of alfalfa in Manitoba and in the State of Minnesota for a number of years. In 1952, these insects were found causing damage in a few fields in the Hudson Bay district of Saskatchewan, about 30 miles west of the Manitoba border. In 1954, enough to cause severe damage were found in several fields as far west as Garrick, about 100 miles west of the Manitoba border. It seems likely that these insects will continue to increase in numbers and spread westward.

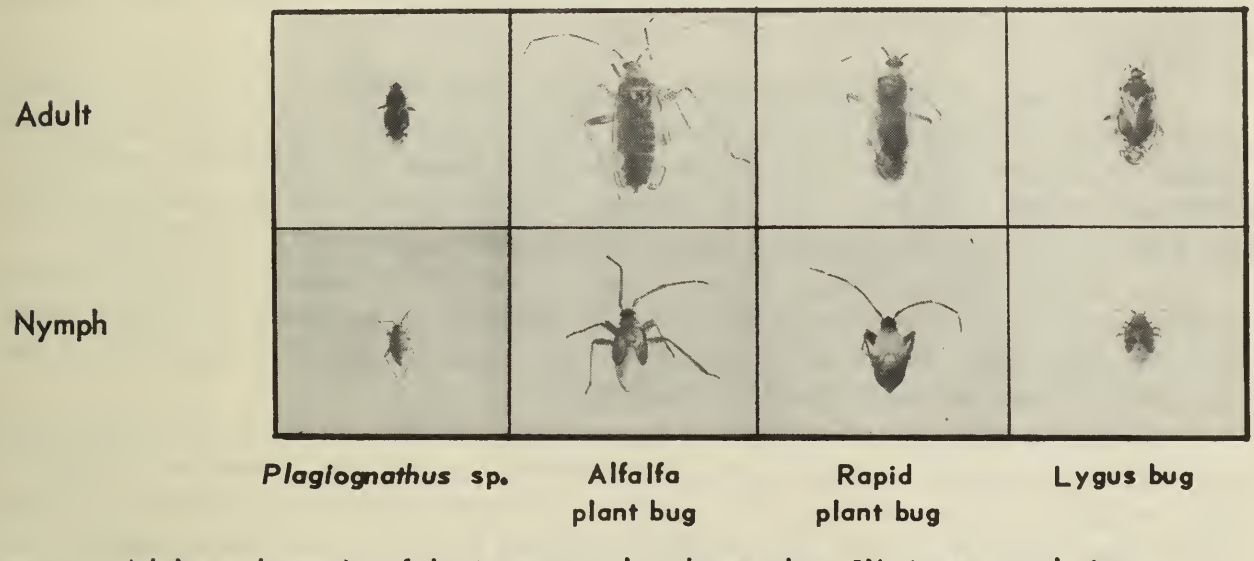
The adults are about a quarter of an inch long and a third as wide. They are pale green or yellowish-green. The small, newly hatched nymphs are light brownish, but the older numphs, which are more likely to be seen, are pale green, with very small, dark specks, particularly on the legs and front portion of the body.

The *rapid plant bug,* which is a native insect, has been found in alfalfa fields throughout the northern seed-growing districts. It has never been found in large enough numbers to be of importance, but it probably adds slightly to the damage caused by the other plant bugs.

The adults are about the same size as the alfalfa plant bug. They are usually reddish-brown, but vary from yellowish-brown to dark brown. The nymphs can be recognized by their color; the head and rear portion of the body are reddish-brown, and the front portion of the body is green.

Lygus bugs are present in all alfalfa fields. They have been found in greatest numbers in the smaller fields in districts where considerable virgin land still remains, that is, in the only fields that are really suitable for seed production.

The adult bugs are somewhat flat-backed insects, a little less than a quarter of an inch long, and about half as wide. They are usually brown or greenish-brown, but vary from pale green to very dark brown. The nymphs, or immature stages, are greenish. The younger nymphs look somewhat like aphids, or plant lice, but their bodies are a little harder, their legs are shorter and sturdier, and they are more active than aphids. As they get older they resemble the adults more closely.



Adults and nymphs of the important plant bugs; about 1½ times actual size.

LIFE-HISTORIES AND HABITS

All of these bugs lay their eggs in the alfalfa plants. All pass through five immature stages, which are called first-, second-, third-, fourth-, and fifth-instar nymphs, respectively.

Plagiognathus sp., the *alfalfa plant bug*, and the *rapid plant bug* spend the winter in the egg stage in the stems and branches of the alfalfa. Hatching begins in May and is nearly complete by about mid June. By the middle of July the insects are nearly all in the adult stage. They lay their eggs in the alfalfa stems and branches in late July and during August and September, and the eggs remain unhatched in the stubble and debris throughout the fall and winter. No nymphs and only occasional adults are present in the late fall; neither nymphs nor adults are present in the early spring.

These bugs that overwinter in the egg stage, and hatch in May and June, *may cause noticeable damage by mid June.* Heavy infestations cause so much bud-blasting that bloom simply fails to appear.

Lygus bugs, on the other hand, *overwinter in the adult stage;* they lay their eggs in the spring and early summer, and they hatch later than the insects mentioned above; *in fields where lygus bugs are the only plant bugs* present, damage is seldom very noticeable before about mid July.

The adults spend the winter under leaves and in tufts of grass in native areas near the alfalfa fields. They move into the alfalfa during May and early June to lay their eggs in the upper portions of the alfalfa plants. Most of the nymphs hatch in the latter portion of June and the first half of July, though a few may

appear in early June and even in late May, and limited hatching may occur until late August, particularly in wet, cool years. Adults and all stages of nymphs may be present at any one time during late June, July, and August, though the number of adults is usually small until late July or August. By fall nearly all of the bugs are in the adult stage. Any that are still in the nymphal stage in the late fall are killed by the cold.

Very few of the lygus bugs remain in the alfalfa fields during the winter. As the alfalfa matures they move out to feed on plants such as aster, goldenrod, and biennial wormwood. The very few that remain in the alfalfa throughout the winter move out early in the spring in search of food. Thus, in the early spring only the adults are present; and these are not in the alfalfa, but in nearby native areas.

CONTROL

Plant bugs of one kind or another are in every alfalfa field in the northern seed-growing districts of Western Canada. Control of these insects increases seed yields 15 to over 300 per cent. In many fields it means the difference between a profitable seed crop and complete failure. Control these insects every year; do not wait to find out what kinds of bugs, or how many bugs, are in your fields.

1. *In the early spring, before there is noticeable growth, burn all alfalfa stubble and debris.* Thorough spring burning completely controls the alfalfa plant bug. the rapid plant bug, and *Plagiognathus* sp., which are in the egg stage in the old alfalfa stems and other debris at that time.

Spring burning does not control lygus bugs because in the early spring they are not in the alfalfa fields but in nearby native vegetation. However, it *temporarily* retards spring growth of the alfalfa, and thus delays the movement of the lygus bugs into the fields. The alfalfa recovers from the temporary setback, but lygus bug egg-laying and hatching are delayed and crowded into a shorter period. This enables one application of insecticide, which will kill the insects for only about three weeks after it is applied, to destroy more of the total hatch.

2. *When the alfalfa is well budded, but before flowering is general, spray or dust with three-quarters of a pound of DDT per acre* to control lygus bugs, which are present in every field. One gallon of 25 per cent DDT emulsion, mixed with water, should cover 3 1/3 acres. If you wish to use dust, 25 pounds of three per cent dust, or 15 pounds of five per cent dust, for example, should be used.

3. *In fields where spring burning has been impossible or where a poor burn has been obtained,* watch the alfalfa closely, from the time buds begin to appear, for bud-blasting by *Plagiognathus* sp. or the alfalfa plant bug. If blasted buds are noticed, spray or dust with three-quarters of a pound of DDT per acre immediately. If the alfalfa has to be treated before about mid June to control these early-hatching bugs, a second treatment with DDT may be required in early July to ensure control of the later-hatching lygus bugs.

PRECAUTIONS

1. *Before burning alfalfa and debris in the spring,* be sure to learn the regulations concerning the starting of fires, and *obtain any necessary permit,* from the nearest conservation officer or other official of the provincial department of natural resources.

2. *Thoroughly clean all spraying or dusting equipment* before applying DDT, particularly if the equipment has been used for applying 2, 4-D or other herbicides; 2, 4-D residue may seriously damage alfalfa.

3. *If it is necessary to treat alfalfa when it is well flowered, do so in the evening or early morning when the bees are not working.*

4. *Do not feed to livestock alfalfa that has* been treated with DDT.

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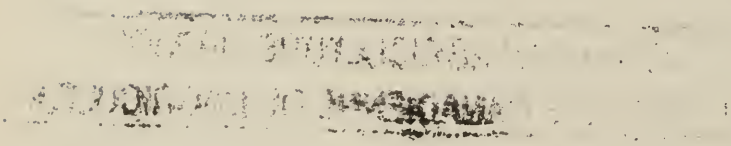

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