SASK LEAFCUTTERS ASSOCIATION

STORED PRODUCT PESTS IN ALFALFA LEAFCUTTING BEE POPULATIONS

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Stored product pest insect specimens were collected during five field seasons from alfalfa leafcutting bee trapnests, alfalfa leafcutting bee incubators, and alfalfa leafcutting bee cell samples submitted by producers. Where necessary, collected insect larvae were reared to the adult stage in the laboratory. All specimens collected were identified to genus and species level. A list of the stored product pest insect species found in association with alfalfa leafcutting bee populations is given in the table below.

While the two most commonly observed stored product pest insect species collected from alfalfa leafcutting bee populations in first and second field seasons of the study were the dried-fruit moth and the black carpet beetle, the confused flour beetle and the black carpet beetle were most commonly observed during the third field season. In the fourth and fifth field seasons, the dried-fruit moth and the black carpet beetle were once again the two most commonly observed stored product pest insect species observed.

The dried-fruit moth is usually seen in its larval form, when alfalfa leafcutting bee cells are removed from nest material. The larvae are able to chew through polystyrene nest material and destroy bee cells in their search for pollen and nectar prior to overwintering, and subsequent emergence in spring as adult moths. Larvae of the black carpet beetle, the confused flour beetle, and the white-marked spider beetle also damage nest material and bee cells, killing bee larvae as they search for pollen and nectar.

Stored product pests are capable of feeding at low temperatures and producing more than one generation per year. As the insects tunnel in nest material, they not only cause extensive damage to bee cells but also provide tunnels in the nest material which may serve as entry points which allow chalcid parasites to parasitize alfalfa leafcutting bee cells.

Optimizing the control of stored product pest insects involves adequate tumbling and breaking of bee cells, along with the utilization of proper bee cell storage techniques, especially during winter storage. Since many stored product pest insect species are active at relatively low temperatures, it is recommended that alfalfa leafcutting bee cells be held in the 5-8^{o}C range during the period between fall bee cell harvest and spring bee cell incubation.

Research has also indicated that treatment of alfalfa leafcutting bee nests with dichlorvos resin strips or pyrethrins during the fall 20^{o}C storage period will help to control stored product pests as well as chalcid parasites present in the alfalfa leafcutting bee nests.

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Stored product pest insects found in Saskatchewan alfalfa leafcutting bee populations

Black carpet beetle	*Attagenus unicolor* (Brahm)
Confused flour beetle	*Tribolium confusum* du Val
Dried-fruit moth	*Vitula edmandsae serratilineella* Ragonot
Larder beetle	*Dermestes lardarius* Linnaeus
Rusty grain beetle	*Cryptolestes ferrugineus* (Stephens)
White-marked spider beetle	*Ptinus fur* Linné
Yellow mealworm	*Tenebrio molitor* Linnaeus

Figure 1

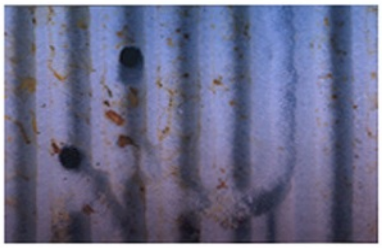

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

Figure 7

Figure 8

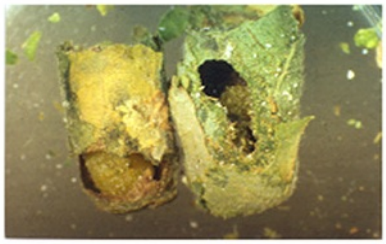

Figure 9

Figure 1. Black carpet beetle larva and associated alfalfa leafcutting bee cell damage.
Figure 2. Polystyrene nest material damaged by black carpet beetle larvae.
Figure 3. Dried-fruit moth larva.
Figure 4. Dried-fruit moth larva and associated alfalfa leafcutting bee cell damage.
Figure 5. Polystyrene nest material damaged by dried-fruit moth larvae.
Figure 6. Dried-fruit moth larval webbing in alfalfa leafcutting bee cells after fall cocoon spinning period.
Figure 7. Adult dried-fruit moth.
Figure 8. Adult white-marked spider beetle.
Figure 9. Alfalfa leafcutting bee cells damaged by white-marked spider beetle.

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