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AN INVENTORY OF STORED GRAIN INSECTS IN MICHIGAN¹

Robert F. Ruppel²

The problems with insects in commercial and farm-stored corn, small grains, dry beans, and soybeans are reduced to a minimum by Michigan's cool climate and usually short period of storage (Ruppel, 1976). Yet insects still infest scattered bins of grain in the state. The incidence of stored grain problems has increased over the past few years. This increase is attributed to an increase in farm storage, often under poor conditions. Poor ventilation of the grains that causes an increase in moisture content at the surface of the grains has been the most common problem. The result has been a flush of problems with what are considered secondary pests; that is, those species that usually can increase only in grains that are in poor condition.

The diversity of insects found in the grain raised the question of what stored grain pests are present and damaging in Michigan. A review of the literature showed that 78 species of insects are recorded as damaging stored grain and seeds in the United States; 65 of these are serious enough pests to have official common names. However, records of their actual appearance as pests in Michigan and surrounding states were extremely sparse. The national list of known pests of grains and seeds was, therefore, circulated among cooperating entomologists at Michigan State University, elevator inspectors of the Michigan Department of Agriculture, and industry specialists. They were asked to note all species they definitely knew to be pests in Michigan.

A list of 40 species of insects and mites was compiled (Table 1). This is about one-half of the species known from the United States. Five orders of insects and one order of mites including 18 families are represented in the list. This, too, is a good representation of the national listing.

The diversity and number of species of stored grain pests found in one state, Michigan, is a good index of the dispersion of these pests. The present listing is not considered to be complete, and I suspect that more species have entered or are actually present in the state. The cool Michigan climate may suppress some species, but it should be noted that species considered to be more southern pests, such as the rice weevil and red flour beetle, are damaging to grains in Michigan. Grain in the state is stored under a wide variety of conditions and almost any species of stored grain pest could probably find a suitable habitat somewhere in the state.

No attempt was made to quantitate the infestations by different species. My own observation is that the meal moth has been the most serious single pest these past few years. Many cooperators noted "wet" area insects, such as the corn sap beetle and cockroaches, as pests in stored grains. Their presence is a good indication of poor storage management. I am convinced that sanitation and good management would reduce our stored grain insect problems, and subsequent need for chemical control, to a very low frequency.

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LITERATURE CITED

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¹Journal article number 8173 of the Michigan State University Agricultural Experiment Station.

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Table 1. Insects and mites known to be damaging to stored grains in Michigan.

Family	Species	Common Name
ACARINA		
Acaridae	<i>Acarus siro</i> Linnaeus <i>Tyrophagus</i> spp.	grain mite cheese mite
COLEOPTERA		
Tenebrionidae	<i>Tribolium confusum</i> duVal <i>Tribolium castaneum</i> (Herbst) <i>Typhaea stercorea</i> (Linnaeus) <i>Tenebrio molitor</i> Linnaeus <i>Gnathocerus cornutus</i> (Fabricius)	confused flour beetle red flour beetle hairy fungus beetle yellow mealworm broad-horned flour beetle
Ptinidae	<i>Ptinus villiger</i> (Reitter) <i>Ptinus fur</i> (Linnaeus) <i>Mezium americanum</i> LaPorte	hairy spider beetle white-marked spider beetle American spider beetle
Trogoitidae	<i>Tenebroides mauritanicus</i> (Linnaeus)	cadelle
Nitidulidae	<i>Carpophilus dimidiatus</i> (Fabricius)	corn sap beetle
Dermestidae	<i>Trogoderma versicolor</i> Creutz <i>Trogoderma ornata</i> Say <i>Attagenus piceus</i> Olivier <i>Anthrenus verbasci</i> (Linnaeus)	"other carpet beetle" "other carpet beetle" black carpet beetle varied carpet beetle
Curculionidae	<i>Sitophilus oryzae</i> (Linnaeus) <i>Sitophilus granarius</i> (Linnaeus)	rice weevil granary weevil
Cucujidae	<i>Oryzaephilus surinamensis</i> (Linnaeus) <i>Cryptolestes pusillus</i> (Schönherr) <i>Platydema ruficorne</i> Sturm <i>Cryptolestes ferrugineus</i> (Stephens) <i>Ahasverus advena</i> (Waltl)	saw-toothed grain beetle flat grain beetle red-horned grain beetle rusty grain beetle foreign grain beetle
Bruchidae	<i>Bruchus pisorum</i> (Linnaeus) <i>Bruchus brachialis</i> Fähræus <i>Acanthoscelides obtectus</i> (Say)	pea weevil vetch bruchid bean weevil
Bostrichidae	<i>Rhyzopertha dominica</i> (Fabricius)	lesser grain borer
Anthribidae	<i>Araecerus fasciculatus</i> (DeGeer)	coffee bean weevil
Anobiidae	<i>Stegobium paniceum</i> (Linnaeus) <i>Lasioderma serricorne</i> (Fabricius)	drugstore beetle cigarette beetle
LEPIDOPTERA		
Pyralidae	<i>Pyralis farinalis</i> (Linnaeus)	meal moth
Phycitidae	<i>Plodia interpunctella</i> (Hübner) <i>Anagasta kuehniella</i> (Zeller)	Indian meal moth Mediterranean flour moth.
Gelechiidae	<i>Sitotroga cerealella</i> (Olivier)	Angoumois grain moth
PSOCOPTERA		
Liposcelidae	<i>Liposcelis</i> spp.	booklice
ORTHOPTERA		
Blattidae	<i>Periplaneta americana</i> (Linnaeus) <i>Blatta orientalis</i> (Linnaeus) <i>Blattella germanica</i> (Linnaeus)	American cockroach oriental cockroach German cockroach
THYSANURA		
Lepismatidae	<i>Thermobia domestica</i> (Packard) <i>Lepisma saccharina</i> Linnaeus	firebrat silverfish