

Insects and Other Arthropods of Economic Importance in Indiana in 1962

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Customarily, this annual report of insect occurrence is prefaced by a cursory summary of the weather as a principal influencing factor in both insect abundance and host development. The conditions for 1962 merit more detailed consideration. April was below normal in precipitation and the first three weeks below average in temperature. Commencing with the last week in April, and continuing through the first week in June (7 weeks), maximum temperatures averaged 6 degrees F. above normal; similarly, minimum temperatures averaged 10 degrees above normal. May was nearly the hottest one on record with mid-May temperatures reaching 90 degrees F. in all areas of the state. These temperatures were accompanied by adequate moisture, the state being blanketed by a tropical airmass with associated cloudiness, high humidity, and frequent showers. The remainder of the summer was characterized by normal to below normal maximum temperatures, about average minimum temperatures, and normal rainfall. Many host plants and spring planted crops responded dramatically to the early, favorable weather to the extent that growth was two weeks ahead of normal. The resulting ecological conditions were reflected in the early appearance of large numbers of some insect species and conditions favorable for supporting high populations of some destructive insects, especially among the chewing groups. Insects favored by a long season of warmth and adequate moisture responded accordingly in 1962.

Field and Crop Insects

Armyworm (*Pseudaletia unipuncta* (Haw.)) moths were low in number during the first flight, but following favorable growing conditions for first generation larvae, the second flight was very large.

A billbug (*Sphenophorus callosa* (Olivier)) continued to cause serious damage to corn plants in Montgomery County. The area is a muck soil and is heavily infested with chufa or yellow nutgrass (*Cyperus esculentus* L.), the preferred host plant of the billbug. Reduction of stand from billbug feeding was about 25 percent, while 85 percent of the remaining corn plants showed typical leaf injury. Reports from St. Joseph and Decatur counties indicated an abundance of the insect in those areas. Two other species (*S. zede* (Walsh) and *S. recta* (Say)) have also been collected and identified.

Blister beetles (*Epicauta* spp.) were again common on many crops, especially on tomatoes and potatoes in localized areas. In alfalfa fields, a pronounced increase was noted. This year's population, coupled

1. Information for this summary has been provided by: W. L. Butts, H. O. Deay, R. C. Dobson, R. E. Dolphin, R. T. Everly, R. L. Giese, G. E. Gould, D. W. Hamilton, G. E. Marshall, D. L. Schuder, M. C. Wilson.

with a high grasshopper year, indicates a potential for a large population in 1963.

Cereal leaf beetle (*Oulema melanopa* (L.)), also called the grain leaf beetle, was reported by the State Entomologist for the first time in St. Joseph and LaPorte counties in August 1962. This is a European pest which attacks small grains and most species of grasses and may be a serious threat to Indiana agriculture. Its first occurrence in these two counties and the adjacent area in Michigan suggests that the pest may have entered the United States by way of the St. Lawrence Seaway.

Common stalk borer (*Papaipema nebris* (Guen.)) returned to a low population level this year and has been of little economic importance.

Corn earworm (*Heliothis zea* (Boddie)) moths and larvae were generally scarce until late August as substantiated by both observation and light trap catches. A pronounced rise in late moth abundance suggested the possibility of an unusually heavy fall infestation. Cold, rainy weather in early September reduced the seriousness of this problem except in corn that was silking at that time. Losses were about double those of 1961 with the greatest increase in the south.

Corn leaf aphid (*Rhopalosiphum maidis* (Fitch)) again showed an increase over the preceding year. Average infestations for the year showed a 4 percent increase with the percent loss increasing from 3.0 in 1961 to 4.1 in 1962. Increases were apparent in the following regions of the state: NNW, NNC, SC, and SSW; decreases were significant in the SE, SSC, and SSE.

European corn borer (*Ostrinia nubilalis* (Hbn.)) showed a general increase in borers per 100 plants except in the far south where a decrease occurred. A localized, heavy infestation and moth flight occurred in Jasper County both in the first and second generation. A light trap operated at this location caught an average of 65 moths per night, May 28-June 4; 100 per night, June 5-11; 50 per night, July 10-17; and 100 per night, July 18-31. The fall corn survey in this same area revealed 52.7 percent infestation with an average of 87.3 borers per 100 stalks. G. E. Gould reported that potatoes grown in the region were 100 percent infested with the corn borer. The overall state average was 27.0 percent infestation and 32.0 borers per 100 plants.

Southern corn rootworm (*Diabrotica undecimpunctata howardi* (Barber)) was present on corn, while populations of the adult beetles on cucurbit and other crops were somewhat lower than usual.

Northern corn rootworm (*Diabrotica longicornis* (Say)) is becoming more of a problem, especially where farmers are following a program of continuous corn. Losses in general were negligible in 1962, as growing conditions were good. Beetles feeding on corn silks were reported from a few counties.

The striped cucumber beetle (*Acalymma vittata* (Fab.)) appeared the middle of May, about two weeks earlier than usual. On the whole, wilt was much more prevalent than in former years. The beetles migrated into commercial fields and home gardens in small numbers over a period of several weeks. As a consequence, fewer areas were treated with sufficient insecticide to check the beetles and thus the bacterial wilt which

they spread. A related species, *A. gouldi* (Barber), was described from specimens collected in Indiana in 1942 and had not been collected since. During the summer and fall of 1962, numerous specimens were found on wild cucumber, squash, melons and cucumbers.

Cutworms were of minor importance during 1962 and few reports were received. Some losses to corn were caused by the black cutworm (*Agrotis ipsilon* (Hufnagel)) early in the season. Meadow mint was damaged early by several species of cutworms.

Fall armyworm (*Laphygma frugiperda* (J. E. Smith)) occurred in low populations in 1962.

The fruit fly (*Drosophila melanogaster* (Meig.)) continues to be the major insect problem confronting the canning industry. Even though some fields had been treated with an insecticide on a 3-day schedule, fly populations and egg deposition in baits were quite high in late September.

Grasshopper (*Melanoplus* spp.) populations again increased over the preceding year. Damaging infestations occurred in localized areas throughout the southern three-fourths of the state. The dominant species were *M. femurrubrum* (DeG.) and *M. differentialis* (Thomas). In Decatur County, an infestation in one field of soybeans averaged 40 grasshoppers per square foot.

Hessian fly (*Phytophaga destructor* (Say)) infestations increased over 1961. Seventy-five samples from 36 counties ranged from 0 to 45 percent infestation, and averaged 10 percent for susceptible varieties. Resistant varieties ranged from 0 to 9.4 percent, and averaged 3 percent.

Tobacco hornworm (*Protoparce sexta* (Johan.)) caused little damage to tomatoes. Fewer larvae were observed on plants and moth flight numbers were down.

Japanese beetle (*Popillia japonica* (Newman)) occurs in at least 52 localities in the state. In September of 1962, the state was placed under a federal quarantine which prohibits shipment of certain plants and plant products to states to the north and west. One infestation in Newton and Benton counties occurs in a rural area where the adult beetles feed on the foliage of smartweed and soybeans and to a lesser extent on the silks of corn. Although the infested area on the Indiana side of the state line is some 180,000 acres, heavy populations occur only over 2000 acres. Losses to soybeans from beetles feeding on the foliage has run as high as 33 percent in some fields. Beetle feeding on corn silks in one heavily infested field reduced pollination on some ears to the extent of yield reductions of 25 percent.

Meadow spittlebug (*Philaenus spumarius* (Linnaeus)) was again a serious insect problem on alfalfa and clover in Indiana. It was most abundant in the southeastern counties. Each year infestations become of greater significance in the southwestern part of the state from Terre Haute to Evansville. They were higher in 1962 in this area than in previous years.

The potato leafhopper (*Empoasca fabae* (Harr.)) continues to be one of the major insect pests in the state, as it is destructive to potatoes, beans, alfalfa, and clover. On the latter two, there was considerable

yellowing and stunting in July and August. Plantings of Purdue's new alfalfa variety, Culver, which was developed for insect resistance, showed very little damage from either potato leafhoppers or spittlebugs in comparison with other varieties.

Spotted alfalfa aphid (*Therioaphis maculata* (Buckton)), for the sixth consecutive year, was not successful in surviving the winter in Indiana. Infestations were not found in the state until mid-September when the insect was collected in small numbers in Harrison, Floyd and Clark counties. Winged adults were taken in the latter two areas.

Wheat jointworm (*Harmolita tritici* (Fitch)) infestations, based on fifty-six samples from 31 counties, showed an average infestation of 7.5 percent, which was an increase over 1961. Infestations ranged from 0 to 88 percent of the stems infested per field sample.

Wireworms occurred as damaging populations in localized areas. In Montgomery County, a high population caused serious losses in a field of mixed corn and grain sorghum.

Fruit Insects

Apple maggot (*Rhagoletis pomonella* (Walsh)) infested almost 100 percent of the fruit in small unsprayed orchards in northern Indiana. Commercial growers, adjacent to such locations, experienced difficulty in preventing oviposition in their apples.

The codling moth (*Carpocapsa pomonella* (L.)) was expected to cause difficulties this year due to last season's build-up. The potential was there and persistent efforts were necessary to contain the pest. Larvae continued to hatch well into October.

Grape cane gall maker (*Ampelogypter sesostris* (Le C.)) was almost absent after three years of heavy attack in some vineyards.

European red mite (*Panonychus ulmi* (Koch)) populations started building up before petal fall and continued to be persistent and, in many instances, high through August 10. This species has become resistant to most of the miticides labelled for use during the post-bloom period.

Four-spotted spider mite (*Tetranychus canadensis* (McGregor)) was not found in Indiana orchards.

Two-spotted spider mite (*T. telarius* (L.)) was prevalent in many orchards from mid-June into late August, but was not as severe in September as it was in 1961. The species is highly resistant to most miticides labelled for their control.

Red-banded leaf roller (*Argyrotaenia velutinana* (Walker)) was again low in numbers, although considerable damage occurred in October to apples in common storage.

Rosy apple aphid (*Anuraphis rosea* (Baker)) appeared in average or below average numbers.

A whitefly (not identified) was serious on strawberries and grapes in southern Indiana.

Woolly apple aphid (*Eriosoma lanigerum* (Hausmann)) was exceptionally numerous in a few isolated orchards in southern Indiana.

Livestock Insects

Cattle grubs (*Hypoderma bovis* (Linnaeus) and *Hypoderma lineatum* (de Villers)) continued to be serious pests of shipped-in feeder animals and were moderate pests of locally grown animals.

Face fly (*Musca autumnalis* (DeG.)) was present over most of the state again this year. Populations remained fairly low throughout the west and central areas until late summer when abundant rains and warm weather resulted in environmental conditions suitable for a build-up. The eastern quarter of the state had high populations throughout the summer since rainfall conditions were more conducive to large populations here than over the rest of the state.

Horn fly (*Haematobia irritans* (L.)) was present in large numbers on untreated cattle during the summer throughout the northern half of the state after a dry period in the spring had prevented an early build-up. Areas with normal rainfall had many flies even early in the season. Populations this year showed a slow build-up and only one peak (late in the summer), compared to a normal early peak, a reduction during midsummer, and another peak in the fall.

Horse flies (*Tabanus atratus* (Fab.) and *T. sulcifrons* (Marquart)) were at the lowest level of the past three years.

House fly (*Musca domestica* (L.)) built up to high populations early in the summer due to very warm conditions in May. This species was extremely abundant around barns where press of spring planting prevented carrying out proper sanitation practices. The populations dwindled during the summer to normal levels and remained normal for the remainder of the season.

Stable fly (*Stomoxys calcitrans* (L.)) was present in normal populations throughout the year, becoming a pest locally where bedding was not removed frequently.

Pests of Man and Households

The larger yellow ant (*Acanthomyops interjectus* (Mayr)) has caused great concern among homeowners during September and early October. Its rather massive swarming flights have been mistaken for the activities of termites and frequent inquiries have been received.

The Asiatic oak weevil (*Cyrtopistomus castaneus* (Roelofs)) was taken in Indiana for the first time. In Jennings and Jackson counties, great numbers of this weevil were found invading houses. It was also taken in Harrison County in sweep samples from alfalfa.

Cat flea (*Ctenocephalides felis* (Bouché)), as based upon requests received, was a considerable pest in homes during the latter part of the summer.

Elm leaf beetle (*Galerucella xanthomelana* (Müller)) adults have been the subject of complaints since mid-June with many beetles entering houses even from the first generation population.

The German cockroach (*Blattella germanica* (Linnaeus)) continues to cause trouble throughout the state, and the presence of several chlordane-resistant strains have been definitely established.

House cricket (*Acheta domesticus* (L.)) occurred as a localized but very severe population and invaded the town of Waverly, Morgan County,

during early June. Extensive spraying of yards and a nearby dump finally gave control.

Mosquito populations have caused an increasing interest in various parts of the state concerning community control operations and, in most cases, there has been little evidence of sound planning for such operations.

Picnic beetles (*Glischrochilus* (spp.)) were of considerable nuisance importance. The problems caused by these insects, with respect to disrupting picnics and other outdoor activities, have increased during the year, although complaints during late August and September were not so numerous as expected.

The straw itch mite (*Pyemotes ventricosus* (Newport)) was abundant and severe in straw throughout the state in the fall. Many complaints were received of attacks on man and fumigation of some stored straw was necessary.

Subterranean termites (*Reticulitermes* (spp.)) were of considerable importance during the spring swarming season with many requests for information on control. There is also evidence that preventive soil treatments for new construction are becoming better understood and accepted.

Ticks, as based on the number of inquiries received concerning tick control, have been unusually low this year.

Tree, Shrub and Forest Insects

Bagworm (*Thyridopteryx ephemeraeformis* (Haworth)) was important on both evergreens and deciduous trees, many evergreens being killed by defoliation in August.

Birch leaf miner (*Fenusa pusilla* (Lepelletier)) commonly damaged white birch foliage in ornamental plantings at Plymouth.

Catalpa sphinx (*Ceratonia catalpae* (Boisduval)) caused almost complete defoliation of catalpa in many areas in north central Indiana.

The columbian timber beetle (*Corthylus columbianus* (Hopk.)) is at the lowest population density in many areas of Indiana since 1954.

Cottony maple scale (*Pulvinaria innumerabilis* (Rathv.)) populations were lower than for the past several years in northern Indiana. Hatching of the eggs occurred early in June because of unseasonably warm weather.

Eastern tent caterpillar (*Malacosoma americanum* (Fabricius)) formed nests in flowering peach trees and wild cherry trees in late April and early May in southern Indiana. Population levels were about normal.

Elm leaf beetle (*Galerucella xanthomelaena* (Müller)) was extremely abundant on Chinese elm in the greater Lafayette area. Many complaints of damage and requests for control recommendations were received during the month of August.

The European pine sawfly (*Neodiprion sertifer* (Geof.)) continued to be an important pest of pine plantations and was found in Perry County for the first time.

European pine shoot moth (*Rhyacionia bouliana* (Schifferrmüller)) began emerging the first week of June in northern Indiana, about 10

days earlier than normal. For the first time, it was found in Perry County.

Fall webworm (*Hyphantria cunea* (Drury)) was unusually abundant throughout the northern tier of counties where many trees were defoliated.

Fletcher's scale (*Lecanium fletcheri* (Cockerell)), a severe pest of yews, arbor vitae and juniper, was more destructive than normal in many areas of the state.

Hackberry lace bug (*Corythucha celtidis* (O. and D.)) populations were low this year.

The holly leaf miner (*Phytomyza ilicis* (Curtis)), a frequent pest in the southernmost counties of the state, was discovered infesting hollies in Vigo County for the first time.

Honeylocust gall mite (*Eotetranychus multidigitula* (Garman)) was common on thornless honeylocust trees at LaPorte early in July.

A juniper tip midge (*Oligotrophus* (Sp.)) occurred in large numbers on cannaert junipers throughout the state.

Leaf roller (*Tortrix pallorana* (Rub.)) larvae of the first generation continue to be important in two and three year old pine plantations. Parasite population appears to be building up and may help in keeping damage below economic levels in future years.

Locust leafminer (*Xenochalepus dorsalis* (Thunberg)) damaged black locust foliage in several areas of the state. Mining of the leaflets caused the foliage to turn brown as if scorched by fire.

Maple bladder gall mite (*Vasates quadripedes* (Shimer)) was again common on silver maples throughout the state.

Maple petiole borer (*Caulocampus acericaulis* (MacGillivray)) caused concern in mid-May by defoliating hard maples in several areas of the state.

The mimosa webworm (*Homadaula albizziae* (Clarke)) continues to spread northward in the state. The infestations, particularly those of the first generation, appeared less devastating, although fully as numerous as last year.

Nantucket pine moth (*Rhyacionia frustrana* (Comstock)) continues to damage terminals of pine trees in southern Indiana, especially in new plantings. Virginia and Jack pines are the most susceptible pine species.

Oak kermes (*Kermes* (spp.)) was less troublesome on bur and white oaks than in previous years.

Oak skeletonizer (*Bucculatrix ainliella* (Murtf.)) populations fell below economic levels in 1962.

The oak succulent gall (*Andricus palustris* (O.S.)) was commonly found on pin oak; many complaints were received.

The Pales weevil (*Hylobius pales* (Herbst)), often a severe pest of young pine trees, was discovered in Brown County attacking Scotch pine. This is the first time that the insect has been reported from the state since 1916. Damage was negligible.

A pine weevil (*Pissodes approximatus* (Hopk.)) was discovered killing two and three year old pine transplants in Jefferson County. The

larvae feed beneath the bark above the soil line and girdle the plant. Pupation occurs in June within a typical chip cocoon.

The red-headed pine sawfly (*Neodiprion lecontei* (Fitch)), an occasionally destructive defoliator of pine, was found in Franklin and Perry counties in June.

Smaller European elm bark beetle (*Scolytus multistriatus* (Marsh)), the vector of Dutch elm disease, continues to be important in the northern portion of the state, where the disease is common.

Sod webworms (*Crambus* (spp.)) were much more abundant than for several years, doing extensive damage to lawns and turf throughout the state. Economically, it was one of the most important insects of 1962.

Spruce spider mite (*Oligonychus ununguis* (Jacot)) was abundant on evergreens in late June in many areas of the state.

The walking stick (*Diaperomera femorata* (Say)) was again represented by a high population density in Stark County where it was feeding on black oak.

Walnut caterpillar (*Datana integerrima* (G. and R.)) populations were lower than in 1961; fewer walnut trees were defoliated, and few complaints of damage were received. One contributing factor appeared to be lack of adequate food supply due to an early leaf disease.

The Zimmerman pine moth (*Dioryctria zimmermani* (Grote)) continues to damage pine trees in the northern half of the state. It was reported from Boone County for the first time. Infestations in poorly managed stands averages 85 percent.

It is customary, in this annual report, to list the ten most important insects and related Arthropods in Indiana for the year. Judgment is always difficult and ranking is by composite opinion rather than from quantitative survey data. A large number of insects were present in significant numbers in 1962 and considerable expenditures were made to contain others. Furthermore, it could be said that serious difficulties were not experienced from any species, due principally to a favorable growing season in which plants supported large populations without apparent severe depredation. There was, therefore, no agreement among the reporting staff as to those belonging to the first ten.