

## Insects and Other Arthropods of Economic Importance in Indiana in 1964

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Weather conditions, especially the continuing period of drought, noticeably influenced the abundance and importance of certain species of insects in Indiana in 1964. The Fall of 1963 was quite dry having a deficit of between 3.7 and 5.9 inches of rainfall. This condition was punctuated by below normal precipitation during the following winter. The heavy rains of March and April did not compensate, and the summer and fall conditions aggravated the situation by being extremely dry in most localities.

In the Evansville area, rainfall from April through September was 3.6 inches below normal while the deficit in central Indiana was 4.90 inches. By considering the additive effect of last year and this year, it can be seen that unusually dry conditions prevailed. The temperatures during 1964 have not been markedly out of line with the long term averages. Dryness, then, is the principal factor.

### Field and Crop Insects

Alfalfa weevil (*Hypera postica* (Gyll.)). Perhaps the most destructive of all alfalfa pests, the alfalfa weevil has been systematically extending its range throughout the Mid-West for the past several years. It was first reported from Hart County, Kentucky in July, 1959 (Cooperative Economic Insection Report 9(45): 980) and from Belmont County, Ohio in September, 1960 (CEIR 11(9): 111). The locations of these original discoveries and the subsequent spread of the pest within these states would seem to suggest that the alfalfa weevil was introduced into Kentucky from its southern neighbor, Tennessee and into Ohio from West Virginia. Thus, for at least the past four years populations of *H. postica* have been converging on Indiana from both south and east.

Therefore, it was not too surprising that larvae of *H. postica* were discovered for the first time in Indiana in Knox County on May 13, 1964. Extensive surveys of alfalfa in all other counties in the southern quarter of the state revealed that the following additional counties were also infested: Harrison, Vanderburgh, Gibson, Spencer, Perry, Warrick, Dubois, Jefferson, and Switzerland. Each of the ten counties are located in the southern quarter of the state within 60 miles of the Ohio River. In each instance that the alfalfa weevil was collected there was no evidence of economic damage and generally only one or two specimens were obtained from each field. In no case did numbers exceed one adult or larval specimen per 500 sweeps with a 15 inch net. Experience in other states in which the alfalfa weevil has been newly introduced (for example, Ohio, Maryland, West Virginia, etc.)

<sup>1</sup>Information for this summary has been provided by: J. A. Clark, M. L. Cleveland, H. O. Deay, R. C. Dobson, R. E. Dolphin, R. T. Everly, J. J. Favinger, R. L. Giese, G. E. Gould, G. E. Lehker, D. L. Matthew, J. D. Paschke, D. L. Schuder, M. C. Wilson.

suggests that economic damage may be expected approximately two years after trace numbers are first discovered. Using this experience as a guide, it is anticipated that moderate to severe damage to first growth alfalfa will occur in 1966 in those counties adjacent to the Ohio River and, possibly, throughout the southern quarter of the state.

Figure 1 illustrates the present status of the alfalfa weevil in Indiana and adjacent states.<sup>2</sup> Examination of this figure reveals that the alfalfa weevil entered Indiana from Kentucky and may be expected to continue the northward extension of its range unimpeded. There is also a distinct possibility that within two years another population of *H. postica* will enter the north-east section of Indiana from Ohio.

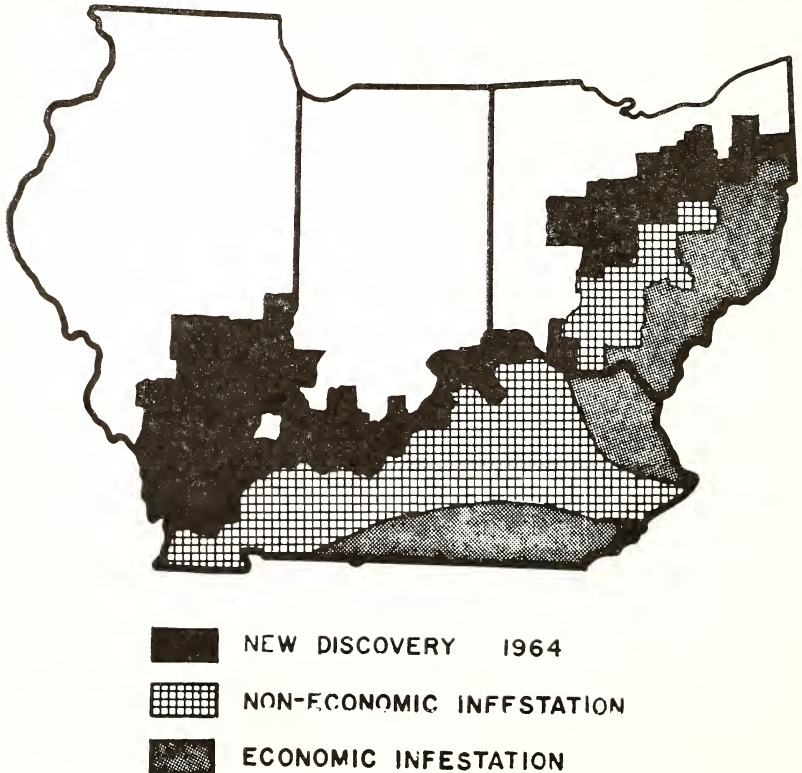


Figure 1. Alfalfa weevil distribution in Kentucky, Illinois, Indiana and Ohio.

*Armyworm* (*Pseudaletia unipuncta* (Haworth)). Although the wet, cool spring would seem to have favored extensive populations of armyworms, large population patterns did not materialize. Scattered infestations were evident with only minor local areas showing damage.

<sup>2</sup>Distributional data for Kentucky was generously supplied in a personal communication by B. C. Pass; for Ohio by R. E. Treece; and for Illinois by H. B. Petty and C. E. White.

A billbug (*Sphenophorus* sp.) caused serious economic damage to a few scattered cornfields in the central and southwestern sections.

Blister beetles (*Epicauta* spp.) were again of no economic importance in 1964.

The cabbage looper (*Trichoplusia ni* (Hubner)) was abundant in commercial cabbage fields and home gardens throughout the state.

The cereal leaf beetle (*Oulema melanopa* (L.)) continued to extend its range in Indiana. The following counties were found to be infested for the first time in 1964; Wells, Jay, Newton, Tipton, Madison, Boone, and Randolph. However, high populations were confined to oats in La-Porte and St. Joseph counties. In this area peak oviposition on oats occurred around May 28, 1964 with egg counts as high as 300 to 350 eggs per 100 stems. Eighty percent hatch was achieved by June 5th with maximum populations reaching approximately 100 to 150 larvae per square foot. Pupation was considered 70 percent completed by June 12th and first emergence of summer adults probably occurred around June 10th. Emerging summer adults reached peak numbers on July 1 and 2 with a subsequent rapid drop in numbers. By July 24th the summer adults were nearly 100 percent in aestivation.

In an effort to introduce biological control agents, a total of 154 adult eulophid parasites, *Aprostocetus julis* (Walker) [= *Tetrastichus julis* (Walker)], were released in severely infested oats fields in St. Joseph County during May and early June 1964. These gregarious larval parasites originated in Italy and were collected by USDA entomologists and J. D. Paschke of Purdue during April and early May. Evaluation of whether or not this species is established in Indiana will be undertaken in the spring of 1965. If established, it is hoped that the parasite will have adequate impact on the population to bring about suppression of economically significant densities of the cereal leaf beetle. Further releases are planned in 1965. In addition, three other species, two solitary larval parasites and an egg parasite, will be available for liberation and colonization in 1965. One of these, *Thersilocus* sp. (probably *moderator* (L.)), has shown promise in laboratory tests. It is a single generation species with obligatory diapause and exerts very significant biotic pressure on *O. melanopa* populations in Italy.

Chinch bug (*Blissus leucopterus* (Say)). The first economic infestation of chinch bugs reported in three years occurred in the northwest section. Nymphal populations completely inhibited development of millet seedlings planted immediately following wheat harvest. Slight damage was also apparent in border rows of adjacent corn. Of 4,000 acres of millet planted, approximately 3,000 acres were lost.

Common stalk borer (*Papaipema nebris* (Guenee)) populations were of no economic importance in 1964; however reports of activity were received from many localities.

Corn earworm (*Heliothis zea* (Boddie)) After the extremely low infestations of corn earworm in 1963, populations approached normal levels in 1964. The fall insect survey revealed that, on a state-wide basis, 9.4 percent of corn plants were infested in 1964 compared to 2.0 percent in 1963 and 17.6 percent in 1962. Highest infestations occurred in the

southern half of the state, particularly in the south, west and south-southwest areas where percent of corn plants infested was 17.6 percent and 14.8 percent respectively. Despite the general increase in population levels, infestations remained light on tomatoes in the commercial growing areas.

Corn leaf aphid (*Rhopalosiphum maidis* (Fitch)) populations reached maximum development by mid-July in the southern quarter of the state and systematically developed northward. Infestations this year exceeded the previous year and this high population density combined with summer drought conditions resulted in considerable loss in yield. On a state-wide basis, 7.9 percent of corn plants demonstrated severe infestations (compared with 3.8 percent in 1963), 20.6 percent had moderate infestations (14.8 percent in 1963), and 37 percent exhibited light infestations (34.6 percent in 1963). Maximum infestation was found to be in the northern half of the state where over 67 percent of plants in each area were infested.

Cutworms were of no general economic concern in 1964. Localized infestations of the black cutworm (*Agrotis ipsilon* (Hufnagel)) caused moderate economic damage to corn seedlings in the northern half of the state and several scattered western areas. The variegated cutworm (*Peridroma saucia* (Hubner)) averaged 10 to 15 larvae per square foot in commercial potato plantings in Jasper County.

European corn borer (*Ostrinia nubilalis* (Hbn.)) populations were considerably higher in 1964 than in the two previous years. In 1964 the state averaged 59.6 borers per 100 plants as compared with 35.7 in 1963 and 28.9 in 1962. As in previous years, the north-northwest and north-northcentral areas demonstrated the highest percentage of infested plants and the greatest number of borers per 100 plants (93.6 in the north-northwest areas and 102.0 in the north-northcentral area). However the south-southwest and south-southcentral areas also experienced exceptionally high infestations with 95.7 and 119.2 borers per 100 plants respectively. In the south-west and south-central areas populations were lower than in either 1962 or 1963. In all other areas of the state, population estimates were higher than in the previous two years. Loss in yield in 1964 approximated 1.5 percent as compared to 1.1 percent in 1963.

Fall armyworm (*Laphygma frugiperda* (J. E. Smith)) populations remained at insignificant levels throughout the state for the third consecutive year.

The fruit or vinegar fly (*Drosophila melanogaster* (Meig.)) continued to decline for the second consecutive year and was of minor significance in tomato growing areas. Dry conditions were influential in the decline.

Hessian fly (*Phytophaga destructor* (Say)) Race B field populations of Hessian fly capable of infesting the W38 resistant wheats (Dual, Monon, Reed, and Redcoat) continue to be a threat, although the average infestations were lower this year than in 1963. Only 35 percent of the 361 certified wheat fields sampled, demonstrated an infestation with Hessian fly. This year, for the first time, three out of

80 Knox 62 fields sampled showed slight infestations indicating the presence of Races C or D. These fields were located in Porter, Tippecanoe, and Warrick counties.

Tomato and Tobacco hornworms (*Protoparce quinquemaculata* (Haworth) and *P. sexta* (Johan.)) were more numerous in 1964 than in previous years. Preliminary evaluation of light trap collections suggest that populations in the southern half of the state were considerably higher than those in the northern half. However, economic damage remained at a low level throughout the state.

English grain aphid (*Macrosiphum avenae* (Kirby)) This insect remained at the non-economic level on small grains throughout the state. Maximum densities reached an average of 5 aphids per sweep in the central section of the state during mid-June and thereafter population densities rapidly decreased.

Grasshoppers (all species) An adult grasshopper survey, conducted during late August and early September, revealed that the grasshopper populations reached maximum densities in alfalfa field margins of 5 to 7 adults per square yard; even these figures suggest non-economic populations. Elsewhere in the state population densities were less than 1 adult per square yard. *Melanoplus femurrubrum* (DeG.) tended to dominate the grasshopper population throughout the state. Other grasshopper species commonly observed included *Melanoplus differentialis* (Thos.) (especially in fence rows and ditches), *Melanoplus bivittatus* (Say), *Dissosteira carolina* (L.), and an occasional *Schistocerca* spp.

Japanese beetle (*Popillia japonica* Newman) adult populations began appearing as scattered, light infestations by mid-June. Although many of these infestations were of local concern to home owners, agricultural damage was restricted to a limited infestation in Newton county. On six selected farms in this area adults averaged 58 per 100 feet of row on soybeans and damage to corn silk by adults averaged 70 percent of the plants. Peak adult activity was apparently reached by the end of July.

Meadow spittlebug (*Philaenus spumarius* (L.)) nymphal populations reached economic levels primarily in the central section of the state where nymphal masses on alfalfa averaged 15 per 10 stems. Nymphal populations also approached economic levels in the southwest section, reaching an average density of 8 spittle masses per 10 stems. Adult populations were non-significant, and exhibited maximum numbers by mid-June in the central and east-central sections. By early September highest adult populations were observed in the north-east section of the state.

Northern corn rootworm (*Diabrotica longicornis* (Say)) adults caused severe silk damage and prevented "ear-filling" in many late-planted fields. Populations are increasing in fields of continuous corn in Henry, Franklin, Wells, and Montgomery counties. In Montgomery County the loss due to larval feeding was 30 bushels per acres where adjacent treated rows produced 94 bushels per acre.

Pea aphid (*Acyrtosiphon pisum* (Harris)) populations were generally non-economic throughout the state. Populations reached maxi-

imum densities in mid-July and rapidly decreased thereafter. Maximum populations in alfalfa (averaging 60 or more adults and nymphs per sweep) were observed in the north-east and north-central sections and the central third of the state. Populations in the southern third of the state were comparatively insignificant.

Potato leafhopper (*Empoasca fabae* Harris) populations again reached economic levels in many areas of the state. This species was most abundant in the north-west section of the state, reaching maximum populations of 12 adults per sweep by the middle of June and then gradually declining in numbers. Populations in the central third remained stable through July (averaging around 3 adults per sweep), declining somewhat in August. Lowest populations were observed in the southern third of the state, particularly the south-east section. Most significant injury to alfalfa developed during late August to mid-September, reflecting the drouth conditions experienced throughout the state.

Six spotted leaf hopper (*Macrosteles fascifrons* (Stal.)) adults were unusually abundant on oats in LaPorte and St. Joseph counties.

Southern corn rootworm (*Diabrotica undecimpunctata howardi* Barber) populations were generally non-economic throughout the state. However, in several scattered areas silk feeding resulted in reduced yields of seed corn.

A soybean cyst nematode (*Heterodera glycines* Ichinohe) aerial survey was conducted by the Division of Entomology, Department of Conservation over 276 square miles of southwestern Indiana. Results of this survey were negative.

Wheat stem maggot (*Meromyza americana* Fitch) Few reports were received and it was much less important than in 1963.

White grubs (*Phyllophaga* spp. and *Cyclocephala* spp.) Populations were generally inconsequential throughout the state. However, an isolated population of *Phyllophaga* sp. caused economic damage to several acres of mint in the north-west section of the state, and *Cyclocephala* sp. was observed to be abundant in sod in Tippecanoe County.

Wireworms (*Melanotus* spp.) of localized destructive numbers were present in several northwestern counties. Heaviest damage was in Porter County.

#### Fruit Insects

European red mite (*Panonychus ulmi* (Koch)) The first hatch for overwintering eggs was noted in the Vincennes area on April 16. Populations began an immediate buildup and continued to be quite persistent through, in many cases, September. The European red mite was considered to be our No. 1 arthropod pest of apples.

Four-spotted spider mite (*Tetranychus canadensis* (McGregor)) Only a few isolated captures of this mite were noted during the current year.

The two-spotted spider mite (*Tetranychus telarius* (L.)) became active in early April and continued to be a pest through September. The populations of two-spotted spider mite were not as troublesome as those of European red mite.

Apple maggot (*Rhagoletis pomonella* (Walsh)) was not a problem in Southwestern Indiana. However, it was troublesome in a number of northern Indiana orchards.

While codling moth (*Carpocapsa pomonella* (L.)) is perhaps potentially the most destructive of our apple insects, this potential was not realized during the 1964 growing season. Instances of heavy commercial damage by this insect in the Vincennes area have not been brought to our attention. However, one orchard, abandoned with regard to insecticidal control after the first cover spray was applied, did develop a population reaching approximately 90 percent infestation before the season was completed. Codling moth adult activity continued through October.

Forbes scale (*Aspidiotus forbesi* Johnson) was not a general problem. Only a few isolated populations are known.

Lesser peach tree borer (*Synanthedon pictipes* (Grote & Robinson)) Damage by this insect was quite prevalent and heavier than in past years. This insect is rapidly becoming one of our No. 1 peach problems. Adult emergence began in April and adults continued to emerge into October of 1964.

Oriental fruit moth (*Grapholitha molesta* (Busck)) First adults of the season were taken on April 2. Populations continued to be active in peach orchards for the balance of the season. There were several instances of oriental fruit moth injury to apple. Oriental fruit moth activity continued through October.

Peach tree borer (*Sanninoidea exitiosa* (Say)) was not as troublesome this year as in past years. In fact, infestations were difficult to find.

The plum curculio (*Conotrachelus nenuphar* (Herbst)) was not as damaging as in the past two years. However, there were several instances of commercial injury by this insect.

Red-banded leaf roller (*Argyrotaenia velutinana* (Walker)) populations were extremely scattered and instances of damage reaching economic proportions were considered to be rare.

A few orchards are reporting a persistent population of San Jose scale (*Aspidiotus perniciosus* Comstock) which appears to be resistant to many of the currently recommended control procedures. Damage was noted on pyracantha, and firethorn plantings in the Lafayette area.

The Shot-hole borer (*Scolytus ruquosus* (Ratzeburg)) was present but not regarded as an economic problem in properly sprayed orchards.

Woolly apple aphids (*Erisoma lanigerum* (Hausmann)) were very numerous in a few isolated orchards in southwestern Indiana but, as yet, have not reached the status of being a general pest. (Only the aerial forms.)

#### Livestock Insects

Cattle grub (*Hypoderma bovis* (L.) and *H. lineatum* (de Villers)) activity increased during the summer of 1963 as was reflected in higher counts of grubs in the backs of animals during late winter. Reports of high activity during the summer of 1964 indicate high grub populations will again occur this winter. Almost all activity was due to *H. lineatum* with scattered reports of *H. bovis* as far south as Dubois County.

Face fly (*Musca autumnalis* DeGeer) overwintering populations gave indications of high summer populations during 1964. These high summer populations did not materialize and face fly numbers remained very low until early September when they reached a high of 30 to 35 per head. They remained at this level for only two weeks and then dwindled rapidly. High September face fly populations occurred only in the eastern half of the state, primarily from Highway 40 northward.

Horn fly (*Haematobia irritans* (L.)) populations were much lower in 1964 than during the preceding year. Even on untreated animals, numbers rarely reached 50 per head in the central part of the state. Populations were higher in the southern area of the state during late August, reaching 250 per head for a period of one month.

Black horse fly (*Tabanus atratus* Fabricius) No economically important numbers of the black horse fly were reported in Indiana this year. Two years of drought have apparently reduced populations drastically.

House fly (*Musca domestica* L.) populations were average to low in areas of good sanitation. Livestock barns with poor ventilation built up and maintained high populations from the middle of July until frost.

The stable fly (*Stomoxys calcitrans* (L.)) was encountered early during the summer of 1964 in the north-central area of the state in higher populations than had been reported in the previous year. These populations dwindled until they were average or below for the rest of the season.

#### Pests of Man and Households

Larger yellow ant (*Acanthomyops interjectus* (Mayer)) Specimens sent in for identification were fewer in number than in previous years.

Box-elder bug (*Leptocoris trivittatus* (Say)) No state-wide trend in the populations of this insect was noted. Populations at any one location fluctuate from year to year. In some places they were almost absent, but in others, the populations were higher than usual.

Cat flea (*Ctenocephalides felis* (Bouche)) Numerous infestations occurred in homes while the occupants were away on vacation. This may occur when dogs or cats are not present to absorb the flea population that develops from eggs and larvae scattered about inside the building.

Clothes moths (*Tinea pellionella* (L.)) and *Tineola bisselliella* (Hummel) Clothes moths continued to decline as important household pests. This may be due to numerous factors, including increased use of synthetic fabrics, improved cleaning and storage facilities, and more effective household insecticides.

Cluster fly (*Pollenia rudis* (Fab.)) Home economics club women report this to be the major pest in many homes and also one among the most difficult to control.

The German cockroach (*Blattella germanica* (L.)) continues to be the most important cockroach in hotels, restaurants and other establishments where food is processed or served. Reports of failure to control this roach with chlordane and conventional insecticides indicates that chlordane resistance has reached a high level.

The Oriental cockroach (*Blatta orientalis* L.) Reports from women attending home economics leader training meetings indicate



that this species is the one most often encountered in homes. Usually referred to by homeowners as a waterbug.

Larder beetle (*Dermestes lardarius* L.) An unprecedented number of infestations occurred in homes during the spring and summer months. Indications are that dead face flies and cluster flies in the walls of these homes may have a contributing factor. The beetles readily develop in decaying animal matter, and in some instances it is believed small animals may have contributed.

Millipedes—Class Diplopoda. Mass migrations into homes were very much less numerous than in previous years. It is possible that dry weather from mid-July on contributed to this reduction.

Picnic Beetles (*Glischrochilus* spp.) These insects were annoying and troublesome for a short period of time in early summer but did not reach the levels of abundance that existed in 1961, 1962, and 1963.

Strawberry root weevil (*Brachyrhinus ovatus* (L.)) These insects appeared in homes earlier than usual and also in greater numbers. They feed upon the roots of strawberries, evergreens and several ornamental plants and come indoors in search of a place to hibernate.

Subterranean termites (*Reticulitermes* spp.) These insects continue to be the number one pest of man's structures. Pest control operators reported fewer swarms in the spring, but no decline in the number economically important infestations.

#### Tree, Shrub and Forest Insects

Sod webworms principally *Crambus trisectus* Wlk., were abundant in turf areas throughout the state for the third year in a row. Control measures were necessary to prevent serious damage.

Ambrosia beetles. The following ambrosia beetles were collected in Indiana during 1964 and represent new state records: *Monarthrum fasciatum* (Say) from pin oak, *Xyleborus affis* Eichh. from river birch, and *Xyloterinus politus* (Say) from silver and red maple were all taken in Dubois County. *Xyloterinus politus* has more recently been found in silver maple in Tippecanoe County. *Xylosandrus germanus* (Bldfd.), first reported from Indiana, Jefferson County, in 1963 has been collected on river birch in Dubois County in 1964.

Bagworm (*Thyridopteryx ephemeraeformis* (Haworth)) populations were lower than usual in most areas of the state, but were locally severe on evergreens around private homes.

The balsam twig aphid (*Mindarus abietinus* Koch) infested Douglas Fir in ornamental plantings in Elkhart. Generally, 1964 populations appeared to be normal.

The black vine weevil (*Brachyrhinus sulcatus* (Fabricius)) was the heaviest in recent years in Lake County. Many nursery and ornamental plantings were heavily damaged and many yew plants killed by the larval feeding. Economic injury was also greater in the metropolitan area of Indianapolis.

The bronze birchborer (*Agrilus anxius* Gory) was again a very serious problem on birch trees. The condition is probably aggravated by the low moisture levels of 1962, 1963 and 1964.

The carpenterworm (*Prionoxystus robiniae* (Peck)) caused considerable damage to oak in Scott County.

Columbian timber beetle (*Corthylys columbianus* (Hopk.)) populations were again very low; this species is clearly a periodic outbreak type and in the trough of population densities.

The cottony maple scale (*Pulvinaria innumerabilis* (Rathron)) was again abundant in northwestern Indiana. The populations in Fowler continues to be severe. There was heavy predation by the twice-stabbed lady beetle (*Chilocorus stigma* (Say)). For the past several years population densities of this insect have been generally low, but an apparent build-up in population has again begun.

Eastern tent caterpillar (*Malacosoma americanum* (Fabricius)) Extremely heavy in southwestern Indiana in the spring. After defoliating the host trees they moved in armies to new sources of food.

Elm leaf beetle (*Galerucella xanthomelaena* (Muller)) populations were higher than during the previous two seasons. Adult populations began moving into hibernation quarters in September, earlier than usual. Chinese elm received most damage during the latter part of the summer.

Euonymus scale (*Unaspis euonymi* (Comstock)) populations were more troublesome than for several years. Infestations of euonymus plantings were common and an infestation of *Pachistima* was reported from South Bend.

The European pine sawfly (*Neodiprion buoliana* (Schiffermuller)) specimens were very difficult to find during the summer of 1964. Since this insect is known to be sensitive to low temperatures, the severe winters of 1961-1962 and 1963-1964 probably account for the low populations.

Fall cankerworm (*Aisophila pomataria* (Harris)) was of no consequence in 1964.

The fall webworm (*Hyphantria cunea* (Drury)) was unusually heavy on both forest and ornamental trees throughout the state.

Fletcher's scale (*Lecanium fletcheri* (Cockerell)) was of less importance in 1962 than in 1963, but was found on ornamental plantings in Hendricks County.

The gregarious oak leaf miner (*Cameraria cincinnatiella* (Chambers)) population was very low early in the season, but by late summer had recovered and caused considerable browning of the pyramidal English oak foliage at Lafayette.

Honeylocust mite (*Eotetranychus multidigituli* (Ewing)) populations were lighter than usual and honeylocust trees held their foliage until frost.

The Judas tree leafhopper (*Erythronoura aelys* McAfee) was again the cause of extensive yellow foliage in south central Indiana on redbud, but populations were lower than last year.

Juniper tip midge (*Oligotrophus* sp.) was of little concern in 1964, probably because of a high parasite population.

A leafroller (*Tortrix pallorana* Rob.) which for several years badly damaged new pine plantings, was barely noticeable during the growing season of 1964.

The locust leafminer (*Chalepus dorsalis* (Thunberg)) was of no consequence in 1964. However, spotty infestations were reported from the southern part of the state.

The magnolia scale *Neolecanium cornuparvum* (Thro) was noticeable on magnolia trees in several areas of the state during August.

Maple bladder gall (*Vasates quadripedes* (Shimer)), a frequent pest of silver maple trees, was of less importance than usual in 1964.

The maple petiole borer (*Caulocampus acericaulis* (MacGillivray)) caused partial foliation of hard maple trees in Bourbon, Marshall County in late May.

Mimosa webworm (*Homadaula albizziae* Clarke) populations of the first generation were much lighter than usual throughout Indiana, but by mid-August the population had reached normal levels and many honeylocust trees were severely webbed and brown.

Nantucket pine moth (*Rhyacionia frustrana* (Comstock)). Of no importance in 1964.

Oak kermes (*Kermes* spp.) appears to be increasing slightly over the state, but was of no economic importance in 1964.

The oak succulent gall (*Adricus palustris* O.S.) was again important in the pocket area of the state where it damaged ornamental plantings of pin oak.

The oystershell scale (*brown race*) (*Lepidosaphes ulmi* (L.)) continued to be a serious problem on many silver maple trees and other ornamental trees and shrubs. Heavy populations were noted to severely damage or kill the host plants.

The pales weevil (*Hylobius pales* (Herbst)) continues to cause trouble in pine plantations in south-central Indiana. It was reported from Jefferson and Jennings Counties for the first time.

The pine bark aphid (*Pineus strobi* (Hartig)) was noticeable on the trunks of pine in Christmas tree plantations in LaPorte County, but apparently caused little damage. In general, populations of this pest were lower than in the previous two years.

Pine needle scale (*Chionaspis pinifoliae* (Fitch)) has begun to appear in pine plantations throughout the state. Thus far only a few individual trees are heavily infested, but this could be an explosive situation.

A pine weevil (*Pissodes affinis* Rand) continues to build up in the stumps of cut-over Christmas tree plantations. These heavy populations will then damage pine transplants.

Privet thrips (*Dendrothrips ornatus* (Jablonowski)) caused yellowing and defoliation of privet hedges at Lafayette.

The rose chafer (*Macrodactylus subspinosus* (Fabricius)) adults caused considerable damage to peonies in Lake, Elkhart and Wabash counties.

The rose slug (*Endelomyia aethiops* (Fabricius)) was damaging to neglected rose plantings and rambling roses seemed to be particularly susceptible. However, in general populations were lower than normal.

The smaller European elm bark beetle (*Scolytus multistriatus* (Marsh)) continues to be important because it is the vector of Dutch

elm disease and is spreading the disease in northern Indiana. However, populations in 1964 were generally lower than normal.

The spruce spider mite (*Oligonychus ununquis* (Jacot)) This arthropod was again heavy on spruce and other needled evergreens throughout the state. Many requests for assistance in its control were received.

Sycamore lacebug (*Corythucha cillata* (Say)) was of little consequence in 1964.

The tea scale (*Florinia theae* (Green)) was reported infesting rhododendrons in LaPorte and Elkhart counties.

The terrapin scale (*Lecanium nigrofasciatum* Pergande) infested ornamental sugar maples at Grabill.

The tulip tree callous borer (*Euzophera ostricolorella* Hulst) damaged shade tree plantings in the Plainfield and Scottsburg areas.

Tulip tree scale (*Toumeyella liriodendri* (Gmelin)) populations were the cause of considerable concern on shade and ornamental trees again in the summer of 1964. This pest seems to be moving into the forest areas of the state and may cause some damage in the future.

Twig girdler (*Oncideres cingulata* (Say)) This insect attacked hickory shade trees in Hamilton County. Reports of spotted injury were received from throughout the state.

Vein pocket gall (*Itonida* spp.) This insect was much less troublesome on pin oak than in previous year. However, in the pocket area of the state, populations appear to be gradually increasing.

The Zimmerman pine moth (*Dioryctria zimmermani* Grote) continues to build up in the northern half of Indiana. Considerable damage was reported from Marion County.