INSECTS OF INDIANA FOR 1929

J. J. DAVIS,* Purdue University

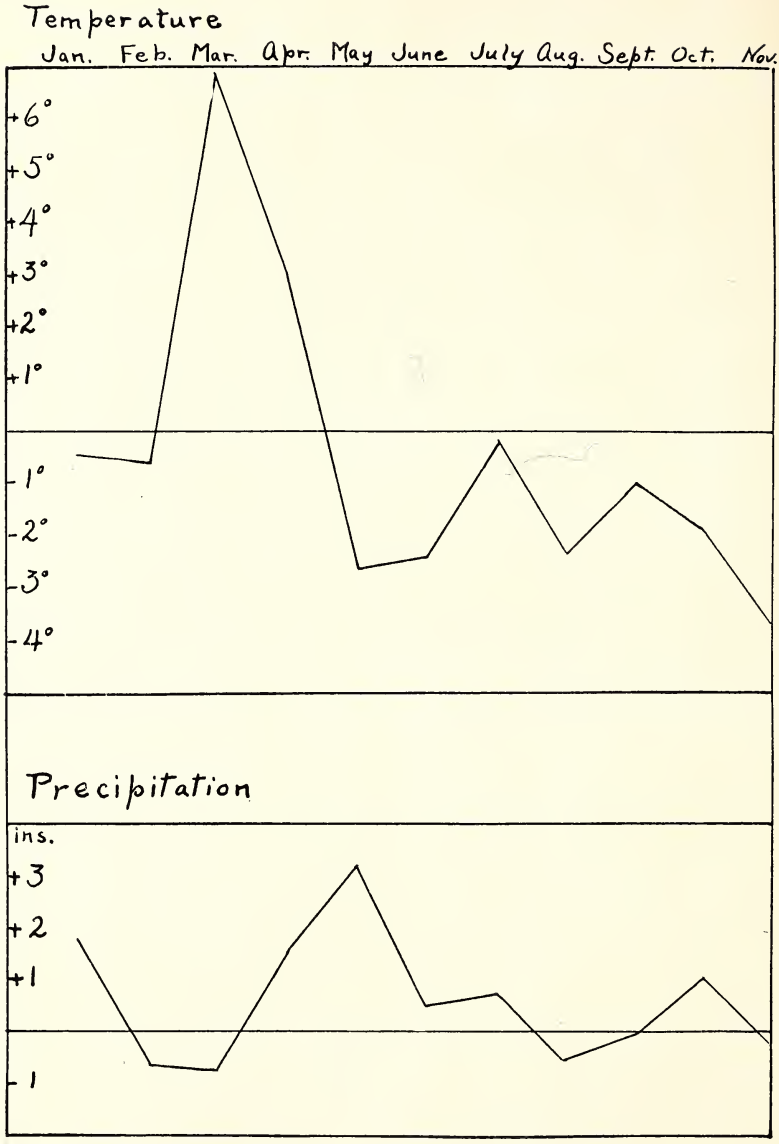
The following account is a summary of the more important insect problems of the past year (1929). The first annual account of the insect problems of the year was published in the Proceeding's of 1925. These annual records have been reported each year and it is anticipated that they will have a future value in determining the factors governing insect troubles and provide material for the prediction of insect troubles in years to come.

Weather Conditions. The temperature was below normal during January and February, although nearly 7°F. above normal for March, while the precipitation during these three months was approximately normal. April was one of the warmest and wettest on record, although the excess in temperature was during the first half of the month, the last half being normal or below normal. May was continuously below normal until the close of the month and the rainfall was nearly double the normal precipitation for that month. June to October was near normal in temperature and precipitation although, in general, below normal throughout the period in temperature. (See Table I and figure 1.)

TABLE I. COMPARATIVE MONTHLY WEATHER DATA FOR INDIANA, 1929

MONTH	Temperature		Precipitation		Number of days		
	State Mean	Departure from Normal	State Average	Departure from Normal	Clear	Partly Cloudy	Cloudy
	°F.	°F.	Ins.	Ins.			
Normal..	28.6		3.05				
January, 1929.....	25.0	−3.6	4.92	+1.87	9	7	15
Normal..	29.6		2.54				
February, 1929.....	25.1	−4.5	1.88	−0.66	10	8	10
Normal..	40.7		3.86				
March, 1929.....	47.6	+6.9	3.11	−0.75	11	10	10
Normal..	52.0		3.49				
April, 1929.....	54.9	+2.9	5.02	+1.53	12	8	10
Normal..	62.2		4.01				
May, 1929.....	59.6	−2.6	7.23	+3.22	12	9	10
Normal..	71.6		3.83				
June, 1929.....	68.8	−2.2	4.38	+0.55	16	9	5
Normal..	75.3		3.40				
July, 1929.....	75.1	−0.2	4.22	+0.82	16	10	5
Normal..	73.3		3.31				
August, 1929.....	71.2	−2.1	2.76	−0.55	18	8	5
Normal..	67.0		3.12				
September, 1929.....	66.1	−0.9	3.05	−0.07	14	8	8
Normal..	54.5		2.69				
October, 1929.....	52.7	−1.8	3.83	+1.14	14	5	12
Normal..	42.2		3.09				
November, 1929.....	38.6	−3.6	2.71	−0.38	11	5	14

*The writer is indebted to R. F. Sazama, W. P. Yetter, C. M. Packard, H. K. Riley, and L. F. Steiner for records.



CEREAL AND FORAGE INSECTS

Grasshoppers not abundant generally but reports from Sullivan and adjoining counties show abundance of these insects and considerable damage, especially to clover. The clover seed yield was apparently materially reduced because of grasshopper injury.

May beetles (*Lachnosterna* spp.) were out at Lafayette April 6 and 7 which is an unusually early record. May beetles were generally abundant in northwestern Indiana and there is evidence of an abundance of white grubs next year. Tiphia cocoons were observed abundant behind the plow at Windfall, May 15, indicating abundance of grubs last year and a high degree of parasitism. Hedge was damaged at Attica, September 19, by white grubs according to a report received.

Wireworms (Elateridae) were moderately abundant in low areas throughout the state, in some cases corn being seriously damaged.

Hessian fly (*Phytophaga destructor* Say). The following information has been furnished by C. M. Packard: "Much injury to the 1929 wheat crop by the Hessian fly occurred in southern Indiana. The spring of 1929 was rather favorable for early and continual fly activity in that part of the state. Abundant rainfall and favorable growing conditions, however, enabled many fields to outgrow fly injury and produce fair yields. In the central and northern parts of the state, fly injury last spring was slight as a result of the scarcity of fly the previous fall and the comparatively unfavorable weather for its multiplication during the spring.

"The summer prospect for infestation of wheat sown in the fall of 1929 was threatening in the southern half of Indiana. The stubbles contained large numbers of spring brood puparia and although parasitism was heavy in that area the percentage of puparia surviving the summer was sufficient to produce a serious outbreak, given favorable weather. In the northern half of the state a general scarcity of puparia in the stubble indicated light infestation this fall.

"The extended late summer drought was unfavorable not only to growth of volunteer wheat and fall fly pupation, but also to early preparation for sowing of wheat. As a result most of the wheat throughout the state was comparatively late sown and contains very little fall infestation. In southwestern Indiana, some localities received sufficient rain in late August so that considerable early preparation of the ground and sowing was accomplished. Abundant early September rains in this region also made possible further comparatively early sowings. These same rains caused general pupation and prompt emergence of flies, resulting in rather heavy fall infestations in volunteer wheat and early sowings from Attica south to the Ohio River. A few fields were sown early and received considerable infestation in the northern part of the state where local rains made it possible. When fly emergence occurred to any extent it was practically over well in advance of the recommended safe-sowing date. This fact, combined with the general delay in seeding caused by lack of moisture, served to mitigate to a large degree the severity of the infestation developing this fall. There is less likelihood of severe fly injury to the current crop then there was last year."

Chinch bug (*Blissus leucopterus* Say) was not observed during the year.

Neither the fall army worm (*Laphygma frugiperda* S. and A.) nor the common army worm (*Cirphis unipuncta* Haw.) were observed during the season, excepting one reported damage to corn by the latter at Greensburg, June 10.

The European corn borer (*Pyrausta nubilalis* Hbn.) continued to spread across the state and to increase in abundance in the older infested areas. In 1928 a total of 21 counties were found to be infested. At the end of 1929 eight additional counties were found infested making a total of 29 infested counties

in the northeastern third of the state. The counties infested by year beginning with the first appearance of the corn borer in Indiana are as follows:

1926	1927	1928	1929
Allen	Adams	Delaware	Blackford
Dekalb	Elkhart	Grant	Henry
Lagrange	Huntington	Fulton	Howard
Noble	Jay	Laporte	Madison
Steuben	Koscuisko	Starke	Miami
Whitley	Marshall		Porter
	Randolph		Union
	St. Joseph		Wayne
	Wabash		
	Wells		

According to counts made by federal investigators under the direction of D. J. Caffrey, the average infestation in the six counties first found infested in 1926 increased from .20 per cent in 1928 to .85 per cent in 1929. In Dekalb and Steuben counties the borers are now sufficiently common to be found by the average farmer. At the present rate of increase they should be sufficiently abundant in these counties by 1931 to begin to show noticeable injury. Not only have the numbers increased in the older infested areas but the spread south and west has been conspicuous. The large increase and spread can be accounted for in part by the fact that little or no attempt was made to properly plow under or otherwise dispose of corn stalks and stubbles and in part by the weather conditions which were favorable for the development and spread of the borer.

A number of European parasites of the corn borer were liberated in Dekalb and Steuben counties in 1929, by federal investigators. One species (*Masicera senilis*), a fly parasite, showed up exceptionally well for the first season. A total of 722 specimens of this parasite were liberated at a point in Steuben County. Recovery studies this fall showed a parsitism of 33 per cent in fields adjacent to the point of liberation and 20 per cent one and one-half miles away.

The common stalk borer (*Papaipenia nitela* Gn.) was generally abundant, the first reports being received June 1. Reports of injury were continuous until September 4, although most of them were received during June and July. Localities included in reports and observation included the following counties: Benton, Boone, Carroll, Cass, Clinton, Daviess, Dearborn, Delaware, Fountain, Grant, Jasper, Jennings, Johnson, Kosciusko, Lake, Lawrence, Marion, Marshall, Montgomery, Pike, Posey, St. Joseph, Sullivan, Tippecanoe, Tipton, Vermilllion, Vigo, Wabash, Washington, White, and Whitley. The majority of these reports referred to injury to corn. In one case a seven-acre field was practically destroyed. Injury to tomatoes was frequently reported and in one instance 20 per cent of a four-acre field was destroyed. In addition, the following crops were reported as being damaged: sweet potato, mango, dahlia, marigold, hollyhock, Gaillardia, Delphinium, Florida fern, cosmos, canna, Zinnia, lily, salvia, columbine, and snapdragon. Two reports were received from Mitchell and Newtown, respectively, of conspicuous injury to peach twigs in orchards of young trees.

Corn earworm (*Heliothis obsoleta* Fab.) continued somewhat scarce, but was more prevalent and destructive than in 1928.

Billbugs (*Sphenophorus* spp.) were not as destructive as during the past few years.

Webworms (*Crambidae*) were reported destructive to corn early in June at Manila, Columbus and Osgood.

Diatrea zeacolella Dyar and *Crambus* sp. (C. Heinrich det.) was reported as destroying 20 acres of corn at Howe, June 25.

A black flea beetle damaged corn at Camelton, June 24, and a black and also a striped flea beetle seriously injured corn at Connersville, June 25. A flea-beetle larva (probably *Systena frontalis* Fabr.) was numerous in Wabash River bottom lands of Gibson County, burrowing in corn seeds and seedlings, according to C. M. Packard.

Tipulid larvae (Tipulidae) were reported abundant in a timothy field at English, March 20. No damage was reported.

Overflow worm (*Agrotis ypsilon* Rott.) destroyed early plantings of corn on several hundred acres following late overflows on Wabash River bottom lands in Gibson County, according to C. M. Packard.

Granulated cutworm (*Feltia annexa* Tr.) damaged corn near Rensselaer in late June.

Corn root aphid (*Aphis maidiradicis* Forbes) was destructive to corn at Charlestown the last of July.

Southern corn root worm (*Diabrotica longicornis* Say) caused corn to fall at Newport, August 7.

Clover root worm (*Colaspis brunnea* Fabr.) damaged corn at Salem, July 13. The beetles were reported abundant and feeding on corn foliage at New Albany and English, July 8 and 12, respectively.

Cowpea aphid (*Aphis medicaginis* Koch) was abundant and destructive to cowpeas at Thayer, Aug. 20.

Larvae of the southern corn root worm (*Diabrotica 12-punctata* Fabr.) were reported burrowing in corn seeds and seedlings in the Wabash River bottom lands of Gibson County, according to C. M. Packard.

Jointworm (*Harmolita tritici* Fitch) was scarce throughout most of the state although common but not injuriously abundant in Gibson and Posey counties, according to C. M. Packard.

Mint flea beetle, (*Longitarsus memthaphagus* Gent.) damaged spearmint at Shipshewana, according to a report received September 9.

VEGETABLE INSECTS

Cabbage worms (*Pontia rapae* L.) were reported destructive to cabbage during June, July and August at Indianapolis, Greenfield, Dyer, Peru and North Judson.

Cabbage aphid (*Brevicoryne brassicae* L.) reported abundant on cabbage at Bristol, July 11.

Turnip aphid (*Aphis pseudobrassicae* Davis) was destructive to turnips at Lyons and Winslow during late August and early September. Heavy loss to a 15 acre turnip field was reported from Fort Wayne.

The cabbage and radish maggot (*Hylemyia brassicae* Bouche) reported during the spring as destructive to radish the season before (1928) at Frankfort, Medaryville, Nappanee, Pierceton, and Wolcott.

Onion maggot, (*Hylemyia antiqua* Meig.) reported damaging onions at Culver, Knox, Helmer, Shelby, Albin, Nappanee, Pierceton, Hudson, Medaryville, Warsaw, Hibbard and Winimac the last of July. However, reports and observations to date show decidedly less trouble than in 1928.

Striped cucumber beetle, (*Diabrotica vittata* Fabr) was reported destructive the last of June and early July at Georgetown, Galveston, Oakland City, Dublin, Newport, Seymour, Hagerstown, North Manchester, Lafayette, Lakeville and Sunman. Larvae were reported attaching roots of cucumber at Crawfordsville, July 1.

Melon aphis, (*Aphis gossypii* Glov.) reported during August as destructive at North Salem, Thayer, North Judson, Seymour, and Macy.

The pickle worm (*Diaphania nitidalis* Stall) was very destructive to pickles during July in Dearborn County.

Potato leaf-hopper (*Empoasca fabae* Harv.) was normally abundant and destructive in northern Indiana.

Flea beetles (species not determined) reported attacking tomatoes at Fremont June 6.

Tomato worms (*Phlegethontius quinguemaculata* Haw.) were very abundant at Lakeville, early in August.

Black blister beetle (*Epicauta pennsylvanica* DeG.) damaged cabbage, tomatoes, beans, and other garden plants at Mt. Liberty, August 15.

Chalcodermus aeneus Boh. injured beans at Campbellsburg, June 24.

Mexican bean beetle (*Epilachna corrupta* Muls.) was normally destructive in the southern half of the state. It was observed in Knox county, the farthest west in the state. It was also recorded from Warsaw but not destructive.

Asparagus beetle (*Crioceris asparagi* L.) reported destructive at Rossville, Aug. 12.

Rhubarb curculio (*Lixus concavus* Say) damaged rhubarb at Ft. Wayne in 1928.

Parsnip webworm (*Depressaria heraclina* DeG.) was a pest of parsnips grown for seed at Rensselaer in 1928.

Tortoise beetle larvae (*Cassidae*) were reported attacking sweet potato at Shoals, July 15.

Squash bug (*Anasa tristis* DeG.) was abundant at Lyons early in July.

Mole crickets (*Gryllotalpa hexadactyla* Perty) reported abundant and attacking planted tomato seed at Greencastle, April 20. This insect was also reported from Liberty and Brownstown in August but no report of injury.

Millipeds were reported damaging plants in several localities. From Berne, April 16, is the report they were abundant in gardens and that tomatoes and strawberries lying on the ground were eaten in 1928. From Jasper is a report, March 13, that they ate the roots of vegetables, flower garden and hot bed plants and it was specifically stated that they ate the roots of tomato and lettuce plants. From Huntington came the report (April 24) that these animals were eating the roots of various garden plants. During the summer radishes were injured at Logansport.

FRUIT INSECTS

The outstanding fruit pest in Indiana in 1929 was the Oriental fruit worm. In addition to the localities observed infested last year, the insect was definitely recorded from Anderson, Bedford, Terre Haute, North Vernon, Lafayette,

Anderson and Goshen. Apparently this new pest is now generally distributed throughout Indiana.

The following table shows the approximate dates of the important periods in the life cycle as observed at Vincinnes in 1929 by Sazama, Yetter and Steiner.

Brood	First Larvae	Peak of Larval Hatch	First Adults
Spring	.....	.....	Mar. 25
First	April 30	May 23	June 1
Second	June 10	June 25	July 8
Third	July 15	July 26	Aug. 8
Fourth	Aug. 15	Aug. 24	Sept. 3
Fifth	Sept. 9	Sept. 20	.....

The first twig injury was observed at Vincennes May 3 although not observed at Mitchell until late June, due no doubt to the scarcity of the insects in that region early in the season. The first fruit injury was noticed at Vincennes the last of June. By the middle of August the peach twigs had sufficiently hardened to make them unacceptible to the larvae and practically all of the larvae were entering peaches, which was during the Elberta and Hale harvest. At the present time over-wintering larvae are numerous in southern Indiana and in some orchards the parasitism exceeds 35 per cent. Four or more different species of parasites have been reared but they have not yet been identified.

In New Jersey, *Macrocentrus ancylivora*, a parasite of the strawberry leaf-roller (*Ancylis comptana* Froh.), has gone over to the Oriental fruit worm and is parasistising as high as 65 per cent of the worms. In as much as we had never found this parasite in Indiana, the writer collected several thousand infested twigs near Moorestown, N. J., late in May. From this collection over 500 adult *Macrocentrus ancyliovora* were reared. These were released in an orchard near Vincennes and counts made by Steiner at weekly intervals showed that it reached a maximum of 58 per cent parasitism 400 feet southwest of the point of release and 43 per cent 1,000 feet southwest of the area of introduction. The results are decidly favorable and indicate the possible future value of the natural enemies in controlling the fruit worm.

The experiments by W. P. Yetter with attractive baits also show great promise and possible value as a practical control.

The codling moth (*Carpocapsa pomonella* L.) was more abundant in 1929 than the year before and the second and third brood larvae were very abundant and caused considerable damage. Large numbers are over-wintering and indicate a serious situation for 1930. According to L. F. Steiner the first adults were observed at Bedford as follows:

Brood	Fruit Egg	First Larva	First Adults
Spring	.....	.....	April 27
First	April 30	May 20	June 30
Second	July 3	July 10	Aug. 15
Third	Aug. 17	Aug. 25	.....

The first adults appeared two weeks earlier than 1928 and a week earlier than in 1927. The peak of the first adult emergence passed before the first eggs hatched but cool weather, about that time, lengthened the hatching period. Second brood larvae began hatching about a week earlier than normal. At the present time the overwintering larvae are abundant.

Peach tree borer (*Aegeria exitiosa* Say) reported destructive at Indianapolis, Peru and Royal Center during September. In general no trouble is experienced from this pest where the paradichlorobenzene treatment is a regular practice.

Shot hole borer (*Scolytus rugulosus* Ratz.) was destructive to plum and peach at Anderson, Gary and Indianapolis during the summer.

The San Jose scale (*Aspidiotus perniciosus* Comst.) is being held in check in most commercial orchards. It was reported abundant on hawthorns at Liberty and on peach at Milltown during August.

Plum curculio (*Conotrachelus nenuphar* Hbst.) is a constant problem and is increasing in some localities in southern Indiana. It would appear that an earlier cover spray, one week after the petal fall, will be necessary in localities where curculio persists.

Apple maggot (*Rhagoletis pomonella* Walsh) (fig. 2) was very abundant and destructive to apples in Elkhart and Lagrange counties.

Bagworm (*Thyridopteryx ephemeraeformis* Haw.) defoliated plum at Brazil and Brookville, apple at Vincennes and fruit trees in general at Worthington during July. These were unsprayed orchards. At Evansville they were abundant in shade trees in July.

Strigoderma arboricola Fabr. adults were reported abundant in an orchard near Michigan City, June 24, but no statement of damage was received.

Woolly apple aphid (*Eriosoma lanigera* Haas.) was abundant on apple at Covington in June.

Rose beetles (*Macrodactylus subspinosus* Fabr.) were feeding on foliage and green apples at Silver Lake, June 13, on peaches, rose, cherry, plum, and grape at Terre Haute June 7, damaging apples at Plymouth June 25 and "by the

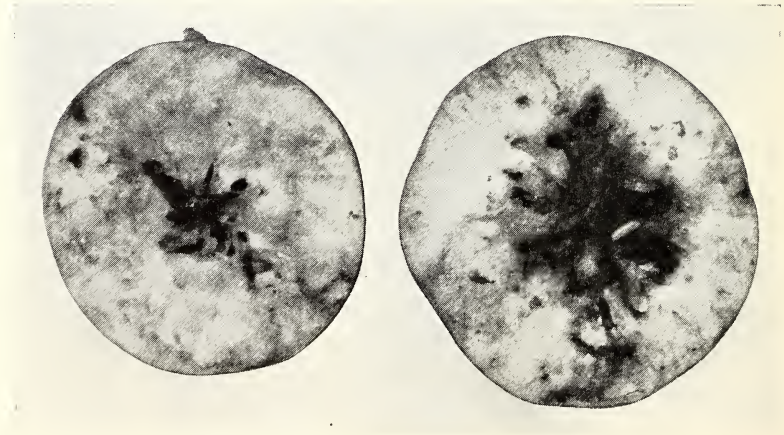


Fig. 2—Cross section of apple showing result of infestation by the apple maggot (*Rhagoletis pomonella* Walsh).

millions and eating everything" at Hobart, June 20. In one case injury to young chickens was reported.

Yellow-necked apple caterpillar (*Datana ministra* Drury) defoliated young apple trees at Morgantown August 6 and linden and apple trees at Lafayette, August 12.

Cherry slug (*Caliroa cerasi* L.) abundant on cherry at Indianapolis, August 13.

Black Cherry aphid (*Myzus cerasi* L.) abundant on cherry at Fremont.

Apple aphid (*Aphis pomi* DeG.) observed abundant on apple at Vincennes April 3. Noticed stem mothers giving birth to their first young at that time.

Catfacing (a trouble caused by the tarnished plant bug and probably other plant bugs) of peaches was considerably less than normal, according to Sazama, which may have been due to rainy weather at the time the insects are usually active.

It was generally abundant in many sections of the state. *Rhopalosiphum prunifoliae* Fitch and *Anuraphis roseus* Baker, were also moderately abundant in some areas.

Pear blister mite (*Eriophyes pyri* Pag.) was abundant at Mishawaka early in July.

The eight-spotted forester (*Alypia octomaculata* Fabr.) damaged grape at Crawfordsville early in July.

The current aphid (*Myzus ribis* L.) and the gooseberry aphid (*Aphis houghtonensis* Troop) were abunadnt at Sheridan the last of June. The gooseberry aphid (*Aphis houghtonensis* Troop) was also abundant at Marion and Berne in 1928 as evidenced by deformed shoots received in April.

Strawberry leaf-roller (*Ancylis comptana* Frohl.) was abundant at Lafayette in late June, at Mishawaka early in July and at Kokomo early in August.

Ips fasciatus Oliv. was reported injuring strawberries at Westville, July 26. Also reported from Kentland injuring tomatoes August 16. Probably not the primary injury in either case.

European red mite (*Paratetranychus pilosus* C. and F.) reported common at Orleans in November. R. A. Sazama reports it in increasing numbers at Vincennes.

Grape root worm (*Fidia viticida* Walsh) reported troublesome at Warsaw.

Grasshoppers injured young apple trees at Moorestown early in September by defoliating and girdling twigs.

Shade Tree and Shrub Insect

Bagworms (*Thyridopteryx ephemeraeformis* How.) were reported during late July and August from the following localities, Indianapolis, Brownsville, Terre Haute, Connersville, Winimac, Richmond, Knightstown and Cloverdale. Winimac is farther north than the usual range of this insect. Cedars were commonly attacked. In one instance rose was noticeably damaged and in another a three-year old apple orchard was badly defoliated.

Tussock moth caterpillars (*Hemerocampa leucostigma* S. and A.) was abundant on grape at Whitney and from Marion on shade trees the first half of July. They were common but not necessarily conspicuous in other central and southern Indiana localities.

Walnut caterpillar (*Datana intergerrima* G. and R.) abundant during July at Bloomfield and Lafayette.

Imperial moth caterpillar (*Basiloma imperialis* Drury) reported on maple at Greenfield, August 24.

Hickory horned devil (*Citheronia regalis* Fab.) was sent in from Commishey August 9 on sweet gum, Petersburg, August 24 on maple. It was sent in from a number of other localities during August but the host was not given. Apparently in no case was it sufficiently serious to call for control measures.

Catalpa sphinx caterpillar (*Ceratomia catalpae* Boisd.) was observed defoliating catalpa more or less generally throughout southern Indiana. In addition it was reported during August in abundance at Romney, Richmond and Lafayette. According to Sazama it was scarce in the vicinity of Vincennes.

Catalpa midge (*Itonida catalpae* Comst.) reported abundant and destructive at Edinburg (July 1), Elwood (July 6), and Huntington (Aug. 22).

Oyster shell scale (*Lepidosaphes ulmi* L.) generally abundant and destructive to ash, lilac and dogwood throughout the northern half of Indiana. Probably normally abundant.

Pine leaf scale (*Chionaspis pinifoliae* Fitch) normally abundant. Reported especially abundant on pines and spruce at Connersville in July.

Cottony maple scale (*Pulvinaria vitis* L.) normally abundant. Special reports of abundance were received during June, July and August from Tipton, New Richmond, Morocco, Anderson, Parker, Francisville, Plymouth, Garrett, Frankfort, Portland and Saratoga.

Tulip tree scale (*Toumeyella liriodendri* Gmel.) (fig. 3) abundant at Corydon, Darlington, Elberfeld and Henryville in late June and July.

Pine bark aphid (*Chermes pinicorticis* Fitch) was abundant on white pine at Rensselaer in October.

Fig. 3—Tulip tree scale *Toumeyella liriodendri* Gmel.), showing small, pale, elliptical young as well as the large, semi-spherical, brown mature individuals.

Maple aphids (*Periphyllus lyropicta* Kess.) were abundant on maples, especially Norway maple, at Pierceton, Edenburg, Morocco, Terre Haute, Salem, Portland, Fort Wayne, Woodburn and Lafayette during June and July

Maple Phenococcus (*Phenococcus acericola* King) was abundant on hard maple throughout central Indiana in late summer.

The native maple aphid (*Drepanaphis acerifoliae* Thos.) was abundant in southwestern Indiana and responsible for noticeable excretions of "honey dew."

The large willow aphid (*Melanoxantherium smithiae* Monl.) was abundant on willow at Crawfordsville and Anderson in August. While they were not noticeably harmful to the trees they were a considerable nuisance, especially because of the blood-red stain when crushed.

The linden lace bug (*Gargaphia tiliae* Walsh) (Drake det.) was observed abundant and destructive to lindens at Louisville, Ky., the last of July. Very likely this pest was similarly destructive across the river in Indiana.

The flat-headed borer (*Chrysobothris femorata* Fabr.) was destructive to maples at Freetown during August.

Lilac borer (?*Podosesia syringae* Harr.) reported damaging lilac at Salem, Crown Point and Evansville.

An unknown sawfly larva defoliated snowberry at Waveland during June.

Red spider (*Tetranychus telarius* L.) damaged evergreens, especially arbor vitae and cedar, at Connersville, Muncie, Scottsburg, Evansville, Anderson, Thorntown, Brownstown and Jasper. At Evansville, Norway spruce was badly infested.

The bladder maple gall (*Phyllocoptes quadripes* Shim.) was abundant on maple at Ray and Wolcottsville during June and July.

Flower Garden and Greenhouse Insects

Grasshoppers riddled flower garden plants at Michigan City in July.

Rose aphids reported during June and July from Newcastle, Gary and Pennville. The spiraea aphis (*Aphis spiraecola* Patch) and nasturtium aphid (*Aphis rumicis* L.) were generally abundant during June and July. The melon aphid (?*Aphis gossypii* Glov.) was abundant on catalpa and althea during June. The root aphid (*Prociphilus erigeronensis* Thos.) was abundant on aster at Richmond in June.

Rose leaf-hopper (*Empoa rosae* L.) damaged rose at Berne in June.

Cutworms damaged pansies in cold frames at Whitland in July.

Red spider (*Tetranychus telarius* L.) was abundant on phlox at Goldsmith June 3 and on evergreens at Carlisle June 6.

Eight-spotted forester (*Alypia octomaculata* Fabr.) defoliated ivy at Hammond in 1928 and the correspondent reports abundance of moths about the ivy vines June 18 of the present year.

Mealy bugs (*Pseudococcus citri* Risso) were abundant and destructive to coleus at Jeffersonville in August. Also mealy bugs (species?) were reported abundant on chrysanthemum, geranium and other plants in a greenhouse at Noblesville, August 15.

Cyclamen mite (*Tarsonemus pallidus* Banks) was very abundant on larkspur at Franklin, August 1.

Fungus gnat maggots (*Sciara sp.*) injured roots of potted plants at Albion in December.

Pests of Stored Products

Grain weevils were reported damaging wheat during September and October at Linnsburg, Lafayette, West Point, Ossian, and Williamsport.

Mediterranean flour moth (*Ephestia kuehniella* Zell.) was abundant in a mill at Pennville in August.

Bean Weevil (*Mylabris obtectus* Say) reported from Lafayette, Laconia, Benton, Gaston, and Franklin.

Household Insects

Fleas (*Ctenocephalus canis* Curt.) were outstanding pests throughout the year and many reports were received. The infestations included dwelling as well as barns and other farm buildings. The following localities reported serious infestations: Attica, Burrows, Crawfordsville, Flora, Greencastle, Hartford City, Indianapolis, Lafayette, Lebanon, Linton, Russellville, Salem, Shelbyville, South Bend and Tipton.

Bedbugs (*Cimex lectularius* L.) were reported abundant in homes during April at Indianapolis, Montezuma and Peru.

Clothes moths (*Tinea pellionella* L.) were destructive to over-stuffed furniture at Evansville, South Bend, Lafayette, Rockville, and Anderson.

Silver fish (*Lepisma saccharina* L.) were annoying in a home at Plymouth in August.

Ants (*Formicidae*) were annoying in homes throughout the summer at Atwood, Lafayette, Fort Wayne, Gary, Anderson and Martinsville. Ants were reported troublesome in the lawn at Indianapolis, Frankfort, Lafayette, Fort Wayne, Gary, Muncie and Winchester.

Carpet beetle (*Attagenus pecius* Oliv.) reported as destructive at Decatur, March 11.

Cigarette beetle (*Lasioderma serricorne* Fabr.) reported infesting over-stuffed furniture at Mt. Vernon.

Box-elder bugs were annoying in homes at Morocco and Collegeville, October 30 and November 7, respectively.

Miscellaneous Pests

Hog lice were reported from Lagro in August.

Termites (*Reticulitermes flavipes* Koll.) are destructive to buildings throughout the state and are the subject of inquiries throughout the year. Among the localities where serious damage has been reported are Bentonville, Columbus, Goshen, Indianapolis, Lafayette, South Bend, Tipton, Vincennes, Elkhart, Crawfordsville, Mulberry, Liberty, Tell City and Cynthiana. Termites were swarming at Lafayette, April 24.

Powder post beetles (*Lyctus* spp.) were reported attaching house timbers, including flooring and joists at Losantville, Knightstown, Russellville, Fort Wayne, Hope and Lafayette.

Chiggers (*Trombicula* sp.) were abundant generally and specifically in a lawn at Terre Haute in July.

Bee moth (*Galleria mellonella* L.) was abundant at Lafayette and Stinesville, attacking foulbrood infected colonies.

Kissing bugs (*Melanolestes picipes* H. S.) were reported April 10 from Freeborn, with the information that they were troublesome and that their "sting is worse than that of a wasp."

The following large caterpillars were sent in for identification: Io Caterpillar (*Automeris io* Fabr.) from Columbia City, September 20; saddleback caterpillar (*Sibine stimulae* Clem) on apple from Hagerstown, August 28; hickory horned devil (*Citheronia regalis* Fabr.) from Princeton and Delphi in September and Cecropia caterpillar (*Samia cecropia* L.) from Liberty, August 30.