

INSECTS OF INDIANA FOR 1926.

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As outlined in the last issue of the Proceedings of the Indiana Academy of Science, it is planned to submit each year a summary of the important insect problems as a basis for future work on insect predictions as well as for record.

Weather Conditions. The absence of an insect is usually due to unfavorable conditions for the natural enemies which normally hold it in check or, as in the case of such insects as the corn ear worm which is not as noticeably restricted by parasites, to weather or cropping conditions which are unfavorable to the insect directly.

Mild weather prevailed in February and early March. However, the latter part of March and during April the temperatures were abnormally low, being the coldest early spring season Indiana had experienced in 40 years. A raise to slightly above normal occurred by the last of May and continued above normal the remainder of the season. The cold weather of March and April delayed insect activity noticeably. Precipitation was approximately normal or below normal until August, when excessive rains occurred throughout the months of August, September and October, much in excess of normal. See table 1 and figures 1 and 2.

CEREAL AND FORAGE INSECTS.

Grasshoppers (*Melanoplus femur rubrum* De G. and *M. differentialis* Thos.) were more general and destructive than in 1925. Possibly less trouble than the year before in the extreme south end. They were damaging peppermint at Mishawaka in the north end of the state June 13. During July and August an increasing number of inquiries were received from the northern two-thirds of the state, the insects damaging clover, alfalfa, various flowers such as dahlia, and vegetable crops in general. They continued to give trouble until after the middle of September.

White grubs (*Lachnosterna* spp.). The adult May beetles were unusually abundant in the northern half of Indiana, especially in the northwestern quarter. Complete defoliation of timber trees was reported from Winamac, Rochester and other points.

Hessian fly (*Phytophaga destructor* Say). As shown in the report for 1925, the flies laid eggs up to the fly-free date but the unusually cold weather in October killed the eggs and small larvae so that the only infestations carried over were those of eggs laid a week or ten days before the fly-free date. The flies were first observed ovipositing at Lafayette May 3. The unusually wet weather the past fall permitted but little wheat to be sown before the fly-free date and there

¹The writer is indebted to H. F. Dietz, B. A. Porter, and C. R. Cleveland for records.

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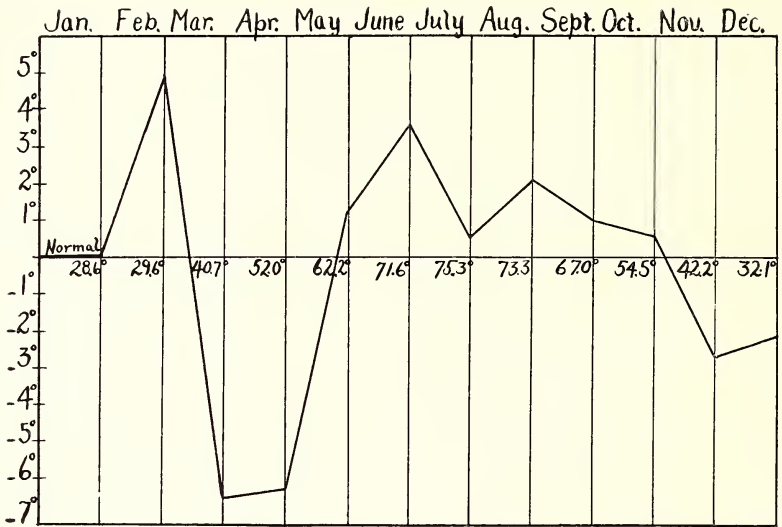


Fig. 1. Departures from normal temperature in Indiana for the year 1926, based on data in Climatological Data, issued monthly by the U. S. Weather Bureau.

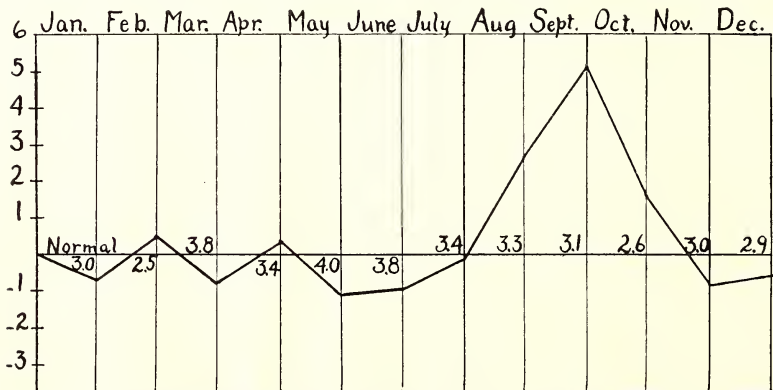


Fig. 2. Departures from normal precipitation in Indiana for the year 1926, based on data in Climatological Data, issued monthly by the U. S. Weather Bureau.

is comparatively little fly in the regularly sown wheat. However, the same wet conditions which prevented wheat sowing was the cause of an excessive amount of early volunteer wheat which, at the present time, is heavily infested. This may result in a heavy spring infestation of fly in 1927.

Chinch bug (*Blissus leucopterus* Say). Showed up spottedly in Indiana in 1926. The first report to reach us was July 19, unusually late. Reports of damage came from Union City, Kentland, Portland, Montmorenci and Linton. Wet conditions during the latter part of the season were unfavorable and there is little likelihood of trouble from this insect in 1927.

TABLE I. Comparative Monthly Weather Data for Indiana

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	4.6	3.05	1.21	10	7	14
January, 1926.....	28.6	0.0	2.26	-0.79	10	6	15
Normal.....	29.6	4.1	2.54	1.19	9	7	12
February, 1926.....	34.5	+4.9	2.85	+0.31	6	7	15
Normal.....	40.7	3.9	3.86	1.54	10	8	13
March, 1926.....	34.3	-6.4	3.05	-0.81	8	8	15
Normal.....	52.0	2.1	3.49	1.23	11	9	10
April, 1926.....	45.8	-6.2	3.75	+0.26	13	7	10
Normal.....	62.2	2.8	4.01	1.07	12	10	9
May, 1926.....	63.4	+1.2	2.89	-1.12	16	10	5
Normal.....	71.6	2.2	3.83	0.96	13	10	7
June, 1926.....	67.5	-4.1	2.93	-0.90	15	10	5
Normal.....	75.3	1.7	3.40	1.05	15	11	5
July, 1926.....	75.7	+0.4	3.30	-0.10	17	10	4
Normal.....	73.3	1.7	3.31	1.04	15	10	6
August, 1926.....	75.4	+2.1	6.16	+2.85	11	11	9
Normal.....	67.0	2.6	3.12	1.02	15	8	7
September, 1926.....	68.0	+1.0	8.17	+5.05	8	9	13
Normal.....	54.5	2.9	2.69	1.16	15	7	9
October, 1926.....	55.0	+0.5	4.32	+1.63	9	11	11
Normal.....	42.2	2.4	3.09	1.19	12	7	11
November, 1926.....	39.5	-2.7	2.10	-0.99	8	6	16
Normal.....	32.1	3.9	2.90	1.03	9	7	15
December, 1926.....	29.9	-2.2	1.96	-0.74	7	5	19

The common army worm (*Cirphis unipuncta* Haw.) was unusually abundant. The outbreak was anticipated by an unusual abundance of moths at lights and at apricot flowers the latter part of April in southern Indiana. The first reports of abundance of the worms came from Poseyville in the southwestern corner of the state May 31. Following the report from Posey County, reports were received from the following counties in order named: Jackson, Daviess, Knox, Greene, Sullivan, Benton, Rush, Warren, White, Pike, Marion, Hancock, Johnson, Montgomery, Tippecanoe, Carroll, Boone and Shelby. The peak of abundance was the first half of June and the last report was received June 21. Beginning on June 19 reports of an abundance of the white parasite cocoons were received, indicating an abundance of parasites. Crops damaged included timothy, oats, wheat and corn.

Cutworms (*Noctuidae*) were unusually abundant the past season. Reports began coming in early in May and continued till the first of July, which was unusually late. A six-acre field of onions at Angola was damaged May 12, but complete destruction, as experienced the previous year, was prevented by using the poison bran bait. Pansies were damaged May 18 at Richmond. Tomatoes and cabbages were damaged in many localities, as was also corn. A severe infestation of cutworms in peppermint was reported from South Bend June 9. All of

the authentic reports received were from the northern half of the state and were general.

The common stalk borer (*Papaipema nitela* Guen.) was an outstanding pest the past season and was more abundant and more general than in 1925. The first report came from Valparaiso June 3, where the borer was destroying tomatoes. Reports continued to be received up to July 26. Following this initial report, records of abundance and destructiveness were received from the following counties in order of receipt: Porter, Blackford, Vanderburgh, Marion, Dearborn, Hendricks, Morgan, Clinton, Fayette, Rush, Owen, Boone, Tippecanoe, Randolph, Montgomery, Warren, Adams, Union, Vigo, Delaware, Johnson, Sullivan, Lawrence, Fountain, Howard, Jefferson, Madison, Grant, Marshall, Lake, Adams, Steuben, White and Decatur. Corn was the crop most often reported as being attacked and tomatoes next. Also reported damaging potatoes, onions, beans, hollyhocks, and dahlia.

Billbugs (*Sphenophorus* spp.) damaged corn at Jeffersonville in the extreme southern part of the state June 26, at Frankfort in central Indiana July 9 and larvae were abundant in timothy at Winamac in the north central part of the state July 19. Apparently normally abundant.

Wireworms (*Elateridae*) were reported early in the season from Brookville infesting sprouting potatoes and from Steuben County where they practically destroyed an eight-acre field of onions. By June 26 several reports were received from northeastern Indiana indicating unusual abundance and destructiveness to onions. Corn was damaged at Madison, Jeffersonville, Indianapolis, Spiceland, North Manchester and Decatur, the last reports coming to us July 13.

Corn ear worm (*Heliothis obsoleta* Fab.) damaged both field and sweet corn in central and southern Indiana during August and September but was not as destructive as in 1925.

European corn borer (*Pyrausta nubilalis* Hbn.) entered the state in 1926, lightly infesting the six northeastern counties, namely, Steuben, DeKalb, Allen, LaGrange, Noble and Whitley. Although reports have been made in the daily press from other sections of the state no authentic records are available. Dozens of the common smartweed borer (*P. ainslei*), which frequently go to pithy stemmed plants to pass the winter, were found in corn stalks and sent in as possible corn borers.

The corn leaf aphid (*Aphis maidis* Fitch) was abundant and apparently destructive to sorghum at Columbus, July 21, and to sugar cane at Aurora, August 3.

Corn seed maggot (*Hylemyia cilierrua* Rond.) was very destructive to corn the latter part of May in St. Joseph, Adams and Rush counties. At Lafayette 50 per cent of a commercial garden bean field was destroyed during early June.

Leather jacket larvae (*Tipulidae*) were reported abundant and injuring corn at Rushville, May 19.

Corn webworms (*Crambus caliginosellus* Clem.) were more abundant and destructive than for several years. The first report of injury

to corn came to us May 31 from Salem in the southern part of the state. This report was followed by reports of damage to corn up to June 15 from many localities in the central part of the state.

The banded flea beetle (*Systema taeniata* Say) was destructive to various crops, especially to corn and cabbage, at Lafayette, Cambridge City, Rushville and Williamsport. These reports were received between June 18 and 25. Damage to corn was severe at Ambia June 28 and to soybean at Plymouth June 26.

The green bug (*Toxoptera graminum* Rond.) was abundant in Indiana for the first time in many years. It was reported from Anderson and Argos, July 18 and 19 respectively, and was apparently doing some damage to oats.

The wheat stem maggot (*Meromyza americana* Fitch) reported damaging wheat at Greenfield, June 28.

The green clover worm (*Plathypema scabra* Fab.) was abundant from August 25 to September 2, especially in the southern counties, but ranging northward to Pulaski County. It was destructive to clover, alfalfa, soybean and garden bean.

Leaf hoppers (*Jassidae*) accompanied a yellowing and leaf spot of hundreds of acres of alfalfa in northern Indiana, according to reports from members of the Purdue Soils and Crops Department. The heavy infestation of leaf hoppers apparently was more than a coincidence.

Clover root borer (*Hylastinus obscurus* Marsh.) caused considerable injury to red clover sod early in August in the vicinity of Lafayette.

Clover white grub (*Colaspis brunnea* Fab.) caused considerable damage to corn throughout central Indiana during June and early July. Reports included Rush, Wayne, Morgan, Warren and Montgomery counties. Greatest damage seems to be to corn planted on spring plowed red clover sod.

The clover leaf weevil (*Hypera punctata* Fab.) was not as abundant as usual. Some reports of injury to little red and sweet clovers were received from southern sections of the state. On May 26 reports of heavy infestations from north central Indiana were received.

VEGETABLE INSECTS.

The Mexican bean beetle (*Epilachna corrupta* Muls.) continued as a serious pest in the southeastern quarter of the state. New records for 1926 include Frankfort and Bluffton, the latter reported by C. C. Deam through H. F. Dietz.

Bean leaf beetle (*Cerotoma trifurcata* Forst.) was reported abundant and damaging bean foliage at Shoals May 14 and Petersburg June 16.

A species of *Empoasca* was reported damaging beans at Paoli June 28.

The potato flea beetle (*Epitrix cucumeris* Harr.) continues as an outstanding potato pest in many sections of the state.

Potato leafhopper (*Empoasca mali* Le B.) is an increasingly important insect of potato. Damage was reported as far south as Danville in 1926.

The common mole cricket (*Gryllotalpa hexadactyla* Perty) was reported damaging potato tubers at Morgantown July 26.

Cabbage and radish maggot (*Hylemyia brassicae* Bouché) was more abundant than usual in the northern half of the state. Reports of damage to cabbage and radish were received throughout the month of June from Bluffton, Elwood, Monticello, Tipton, Marion, Monterey, Modoc, Knightstown, South Bend, and Goshen. An unusual number of reports were received from central Indiana. The normal range is the northern quarter of the state.

Cabbage aphid (*Brevicoryne brassicae* L.) damaged cabbage at Lafayette and elsewhere during July.

The cabbage worm (*Pontia rapae* L.) was abundant and destructive throughout the state during June, July, and August.

Garden flea hopper (*Halticus citri* Ashm.) damaged tomatoes at Terre Haute during the first half of September.

Striped blister beetles (*Epicauta vitatta* Fab.) damaged tomatoes at Romney July 22. Black blister beetles (*E. pennsylvanica*) were damaging tomatoes at Pendleton July 22. During latter part of July and early August blister beetles were conspicuous and occasional reports were received up to September 9. Tomatoes, potatoes and flowering plants, especially aster, were the principal plants attacked. In one case a commercial planting of gladioli at LaGrange was seriously damaged. Preliminary experiments gave excellent control of blister beetles on potato with sodium fluosilicate applied as a dust.

Onion maggot (*Hylemyia antiqua* Meig.) was unusually abundant and destructive the past spring throughout the northern quarter of the state, especially in the northeastern counties. Reports of unusual serious damage came in between June 15 and 23 from Albion, Helmer, Kewanna, Knox, Larwill, Pleasant Lake, Shippshewana, Etna Green, and South Bend.

The squash vine borer (*Melittia satyriniformis* Hbn.) was common as usual. Reports were received from several localities in the central part of the state the latter part of July.

Asparagus beetle (*Crioceris asparagi* L.) did considerable damage in home gardens at Vincennes. The twelve-spotted asparagus beetle (*C. duodecimpunctata* L.) was observed in numbers at Lafayette for the first time.

The greenhouse centipede [*Scutigera* (*Scolopendrella*) *immaculate* Newp.] is increasingly destructive in vegetable greenhouses where serious losses, especially to lettuce, occur.

The melon aphid (*Aphis gossypii* Glov.) began to appear in threatening numbers during June and early July in many sections but the action of the natural enemies checked what appeared to be an incipient outbreak.

The striped cucumber beetle (*Diabrotica vittata* Fab.) caused considerable loss, especially in central Indiana. It was apparently about normally abundant.

The false cabbage aphid (*Aphis pseudobrassicae* Davis) was abundant on turnip and radish in the northern half of the state during late June and early July.

FRUIT INSECTS

San Jose scale (*Aspidiotus perniciosus* Comst.) was less troublesome than for several years. In vigorous growing orchards where proper spraying has not been practiced the scale is a serious problem. According to Porter the winter mortality was 48.6 per cent as compared with 79 per cent the previous winter (1924-25), 57 per cent 1923-24, and 28 per cent 1922-23. In an old apple orchard in poor condition the winter mortality was 72 per cent. The first crawlers at Vincennes were noticed June 11, about 10 or 12 days later than 1925. The second brood crawlers appeared between July 25 and August 1, 13 to 20 days later than last year.

Apple scurfy scale (*Chionaspis furfura* Fitch) was reported as abundant and apparently destructive to apple throughout state. So far as data were obtainable this scale was abundant only in orchards unsprayed or poorly sprayed with the dormant spray. As abundant as last year and in many sections more so.

Apple aphids (*Aphis pomi* De B., *Anuraphis roseus* Bak., and *Rhopalosiphum prunifoliae* Fitch) were practically totally absent early in the season. This was apparently the result of the severe weather early in October, 1925, the cold weather coming before the embryos had made their revolution, which seems to be essential to protect the insect within the egg against severe cold. By the last of June the green apple aphid had become moderately abundant in some orchards.

The apple red bug (*Lygidea mendax* Reut.) was observed occasionally but never abundant.

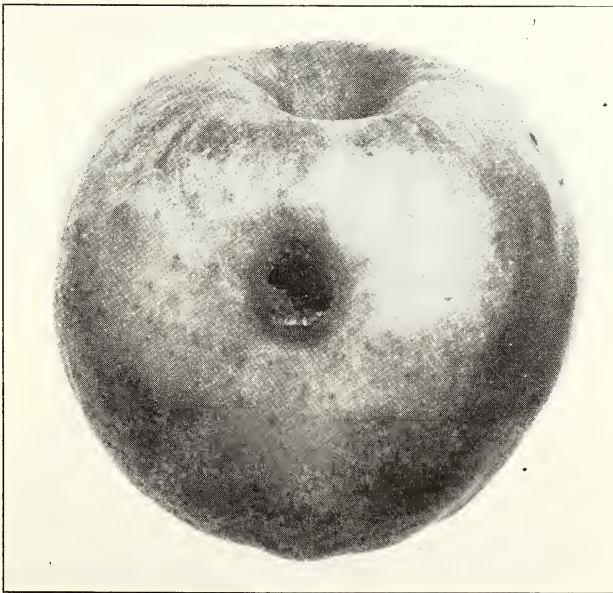


Fig. 3. External evidence of side infestation by codling moth larva. Slightly less than natural size.

Leaf hoppers (*Jassidae*, especially *Erythroneura obliqua* Say and var. *dorsalis* Gill.) became extremely abundant in August, in all apple orchards in southern Indiana. Foliage was badly damaged and fruit showed considerable specking as a result of deposits of excrement.

Codling moth (*Carpocapsa pomonella* L.) increased very materially the past season, resulting in great losses in some orchards and an increase of wormy apples (fig. 3) over last year in nearly every orchard in southern Indiana. The weather conditions were favorable for the insect last fall and again this spring and early summer. These favorable conditions, together with general trend of increasing abundance and the heavier infestations of 1925, have been largely responsible for the increasing seriousness of the codling moth situation.

Porter observed the first moths at Vincennes May 13. The first worms were leaving the fruit about June 19 and the first moths of the second brood July 2. The first eggs of the second brood hatched about July 10.

Even in well sprayed orchards there was considerable damage. In such cases but few of the larvae entered the fruit and matured but they entered the fruit a fraction of an inch before succumbing to the poison, thus marring the fruit. Such injuries are known to growers as "stings". (Figs. 4 and 5).

Apple tent caterpillar (*Malacosma americana* Fab.) A recently hatched infestation was reported May 8 from Walkerton in St. Joseph County. Another infestation was reported from Winamac.

Flat-headed borer (*Chrysobothris femorata* Fab.) was normally abundant throughout the state.

The unicorn caterpillar (*Schizura unicornis* S. & A.) defoliated young apple orchards at Greencastle previous to July 15.

Red-humped caterpillar (*Schizura concinna* S. & A.) defoliated apple at Spencerville, in Dekalb County, previous to September 15. Porter reports them as more abundant than usual in the vicinity of Vincennes. In young apple orchards with little or no spray they were especially common.

Yellow-necked apple caterpillar (*Datana ministra* Drury) was more abundant than usual. Defoliated a considerable number of two-year old apple trees near Indianapolis early in August. Porter reports abundance near Vincennes in young apple orchards which have received little or no spray.

Apple fruit chafer (*Metachroma interruptum* Say) not abundant and no commercial damage. W. P. Flint observed that they were noticeably repelled by arsenicals in Illinois. In one orchard where one block of trees were sprayed only with oils and the remaining trees with an arsenical, there was no commercial damage to the trees sprayed with arsenate of lead and noticeable damage to those sprayed with oil.

Apple flea weevil (*Orchestes pallicornis* Say) was less abundant than in 1925 and there was no commercial damage.

Lesser apple worm (*Laspeyresia prunivora* Walsh) was reported as common and destructive during September from several localities in central Indiana but in general was not very conspicuous or destructive, at least not in southern Indiana.



Fig. 4. So-called "stings," where codling moth larvae died soon after entering fruit, probably death resulting from poison eaten on entering. See figure 5.



Fig. 5. Same apple as shown in figure 4 cross sectioned to show the internal evidence of codling moth larvae "stings."

The red-banded leaf-roller (*Eulia velutinana* Walk.) was not abundant according to our observations the past season.

Bagworms (*Thyridopteryx ephemeraeformis* Haw.) were prevalent in southern Indiana as usual and cocoons were reported as common in orchards. The recently hatched young were first observed June 30 at Terre Haute. This insect was very abundant on shade trees and evergreens in southern Indiana and also was reported defoliating apple trees where little or no spray was applied. Reports were unusually numerous during August.

Plum curculio (*Conotrachelus nenuphar* Hbst.) more or less scattered and in some sections injurious but not more than normally abundant.

Peach tree borer (*Anarsia lineatella* Zell.). Weather conditions were unfavorable last fall for most effective results from the paradichlorobenzene treatment. The situation is not serious however, although many reports were received early in the summer relative to borer abundance.

According to Porter the peak of emergence of the adults, at Vincennes, occurred the last week in August. Emergence continued until about September 10, when it appeared to be practically completed.

Lesser peach tree borer (*Synanthedon pictipes* G. & R.) was common but no worse than in 1925 and probably not quite so bad. Reports of damage were received from all sections of the state.

Shot hole borer (*Eccoptogaster rugulosus* Ratz.) was not as conspicuous as during the past two years. There were, however, many reports of killing of peach and cherry trees from the southern half of the state and as far north as Portland.

Tarnished plant bug (*Lygus pratensis* L.), responsible for considerable damage to peaches the past few seasons in southern Indiana, was unusually scarce early in the spring and as a result the "cat-facing" of peaches was not severe. This insect was reported from Walkerton, May 7, as responsible for wilting of shoots of currants.

Cotton caterpillar moth (*Alabama argillacea* Hbn.) was more abundant and more destructive than for many years, although a few cases of injury have been received every year for three or four years. This year reports came from the following counties, in the order named; Clark, Knox, Kosciusko, Putnam, Montgomery, Lawrence, Jasper, LaPorte, Howard, Wabash, Allen, Gibson, Washington, Owen, and Tipton. First reports received September 15 and continued into October. However, Porter observed them September 1 at Vincennes, just as the Elberta peach harvest was nearly completed, and we noticed them in central Indiana, abundant at lights, September 7. According to all records these moths have never reached Indiana until after the harvest of Hale and Elberta peaches, the principal varieties grown and the damage has been largely to the late peaches and to a lesser extent to grapes and apple.

Rose chafer (*Macrodactylus subspinosus* Fab.) first reported as destructive to fruit (fig. 6) May 29 at Petersburg. Subsequently ap-

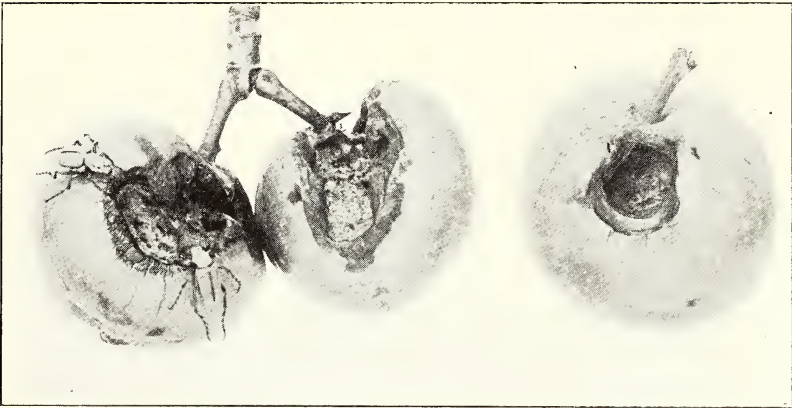


Fig. 6. The rose beetle (*Macrodactylus subspinosus* Fab.) has been a destructive pest of fruits, foliage and young corn in many sections of Indiana for several years. They are also poisonous to young chicks which eat them freely when given an opportunity.

preciably destructive at Hazleton June 3, Princeton June 5, Terre Haute June 7. At Terre Haute the beetle was especially destructive to peach.

Imported currant worm (*Pteronidea ribesi* Scop.) was noticeably injurious in Indianapolis May 18. Dietz observed hatching larvae at Indianapolis early in May.

The currant aphid (*Myzus ribis* L.) was common as usual throughout the state.

The Houghton gooseberry aphid (*Aphis houghtonensis* Troop) was destructive to gooseberry at Culver according to reports received June 21. Apparently less destructive than usual.

Pear and cherry slug (*Caliroa cerasi* L.) defoliated pear at Elkhart according to a report received September 14. In general less abundant than for several years.

Rhinoceros beetle (*Dynastes tityrus* L.) was received from Salem July 19 with the report that it was damaging ripening peaches.

The eight-spotted forester (*Apypia octomaculata* Fab.). Moths observed by F. N. Wallace at Indianapolis May 16.



Fig. 7. The cottony maple scale (*Pulvinaria vitis* L.) on branch of maple. Each of these conspicuous cottony masses contain 2000 or more eggs. A serious pest throughout the northern half of Indiana.

The grape leaf-hopper (*Erythroneura cornes* Say) common throughout central Indiana.

Strawberry leaf-roller (*Ancylis comptana* Froehl.) was reported quite destructive to strawberry at Culver, June 21.

SHADE TREE AND SHRUB INSECTS

Cottony maple scale (*Pulvinaria vitis* L.) (fig. 7) was more abundant in some sections of the northern half of Indiana than usual. For example, it appeared at Lafayette and vicinity in destructive numbers for the first time according to our observations, dating back to 1911. It seems to be more abundant in central Indiana and probably somewhat less abundant in the northern counties. Reports began coming in May 28 and during the season over 100 letters of inquiry were received. The counties represented by these inquiries were as follows: Adams, Allen, Blackford, Boone, Carroll, Decatur, Delaware, Elkhart, Fountain, Grant, Hamilton, Hendricks, Henry, Howard, Huntington, Jay, Madison, Marion, Miami, Newton, Pulaski, Randolph, Rush, Shelby, Starke, Steuben, Tippecanoe, Vermillion, Wayne, Wells and White. The eggs began hatching at Lafayette June 26.

Elm scurfy scale (*Chionaspis americana* Johns.) continued as a pest of young elms in central and northern Indiana.

Oyster shell scale (*Lepidosaphes ulmi* L.). The light brown form began hatching at Indianapolis May 15 according to Dietz. This was somewhat later than usual and nearly three weeks later than 1925. The first young of the form common on lilac were observed at Lafayette June 26. This insect is normally abundant. Reported abundant on apple in a few instances but according to our observations only where regular dormant sprays are omitted.

Snowball aphid (*Anuraphis viburnicola* Gill.) reported as very troublesome in some localities in central Indiana early in May.

Elm cockscomb gall (*Colopha ulmicola* Fitch) reported abundant in several localities in central and north central Indiana.

Walnut caterpillar (*Datana integerrima* G. & R.) was unusually abundant in the vicinity of Vincennes, according to Porter, completely defoliating many walnut trees. It was normally abundant in central Indiana. We received reports of injury from the following counties; St. Joseph, Grant, Hamilton, Clay, Madison, Miami, Howard and Johnson.

Catalpa sphinx caterpillar (*Ceratonia catalpae* Boisd.) much less abundant than usual. Many trees came through the season with most of their foliage which was unusual. Reports of abundance were received from Howard, Orange and Grant counties.

The hickory horned devil (*Citheronia regalis* Fab.) was unusually abundant and many letters, accompanied by specimens were received between August 24 and September 17. Localities included Martinsville, Lafayette, Rushville, Elnora, Burney, Waveland, and Greensburg, all from central or southern Indiana.

White marked tussock moth caterpillar (*Hemerocampa leucostigma* S. & A.) was common in central Indiana and judging from the cocoons

and egg masses at present they will be exceedingly abundant in 1927. A few instances of their abundance on apple were reported but only in poorly sprayed orchards.

The locust leaf-miner (*Chalepus dorsalis* Thunb.) was destructive to honey locust at Richmond early in August.

The gouty vein gall (*Dasyneura communis* Felt) was received from Edinburg June 6. This gall was sent to us in 1925 for the first time, that record coming from southern Indiana.

The maple bladder gall (*Phyllocoptes quadripes* Shim.) was reported from several places in central Indiana during June and July.

The large linden aphid (*Longistigma longistigma* Wils.) (fig. 8) is common every year and is sometimes sufficiently abundant to be annoying. The same is true of the common species in willow (*Melanoxanthium saliceti* Harr.)

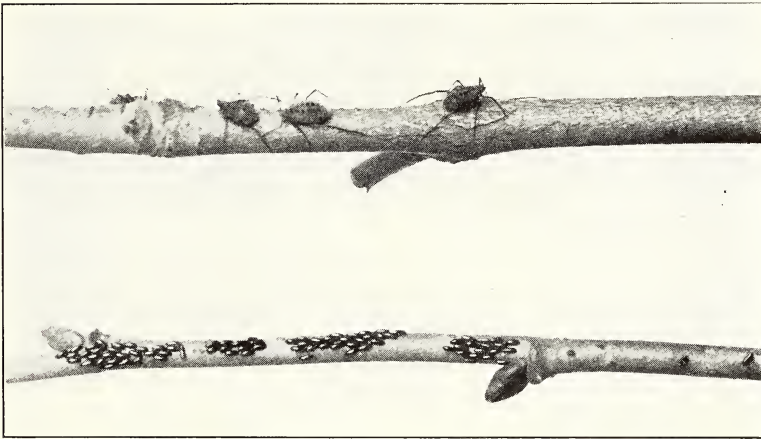


Fig. 8. *Longistigma longistigma* Wils. on linden. This is the largest known species of aphid. Below are shown the jet black eggs as they are laid on linden. Natural size.

FLOWER GARDEN AND GREENHOUSE INSECTS

Onion thrips (*Thrips tabaci* L.) was a very troublesome pest of chrysanthemum during May, according to Dietz. Feverfew and carnations also suffered from the attacks of this insect.

Greenhouse thrips (*Heliothrips haemorrhoidalis* Boché) was reported by Dietz as a troublesome pest of chrysanthemum in greenhouses.

Verbena leaf miner (*Agromyza jucunda* V. d. Wulp) abundant throughout central Indiana latter half of July.

The caterpillar of the painted lady butterfly (*Vanessa cardui* L.) was abundant in central Indiana on Canada thistle. Occasionally they damaged hollyhocks. The insect continued more or less conspicuous from July to September.

Violet sawfly (*Emphytus canadensis* Kirby) damaged pansies at Ft. Wayne the latter part of June.

Rose midge (*Dasyneura rhodophaga* Coq.) was noticeably abundant in two greenhouses at Newcastle during the spring months according to Dietz.

Chrysanthemum gall midge (*Diarthronomyia hypogaea* Coq.). Dietz reports light infestations in central and northern Indiana and a heavy infestation at Kokomo where no attempt was made to control.

The method of shearing off the tops of the stock plants to the ground line or slightly below, keeping the plants rather dry until growth starts again, has proven to be an effective control of this insect if all stock plants are thus treated, according to Dietz. Better plants than usual have been produced by this method.



Fig. 9. The black nasturtium aphid (*Aphis rumicis* L.) is present every year and causes a deformity of stems and foliage.

Iris root borer (*Macronoctua onusta* Grt.) was probably more abundant than in 1925. The eggs began hatching at Indianapolis, according to Dietz, May 2 and continued to hatch on warm days up to May 18.

Greenhouse leaf-tyer (*Phlyctenia rubigalis* Gn.) was common in all greenhouses, being especially common on cineraria, feverfew, Calceolaria, chrysanthemum, forgetmenot, snapdragon and geranium. Damage to celery at Goshen was reported August 13.

Aphids were less abundant than usual. Common species observed, include black nasturtium aphid (*Aphis rumicis* L.) on nasturtium (fig. 9) and poppy; also aphids on rose and sweet pea.

Red spider (*Tetranychus telarium* L.). Dietz reported heavy infestations in greenhouses. Especially common on roses, carnations,

gladioli and sweet pea. Abundance in part due to cloudy weather from October till May which interfered with proper syringing of plants.

A mite, probably *Rhizoglyphus hyacinthi* Boisd. was destructive to gladioli at Columbus during July.

The cyclamen mite (*Tarsonemus pallidus* Banks) was destructive in a greenhouse at Marion in March.

STORED PRODUCTS

Grain weevils were abundant throughout the state the past fall. According to our observations in the vicinity of Lafayette and from specimens sent to us, the species which was unusually numerous was the foreign grain weevil (*Cathartus advena* Walt.). Because of the excessive moisture when grain was threshed and the continued high humidity, grain has shown a decided tendency to mold and offered conditions ideal for this species of grain beetle which lives primarily on mold. These beetles apparently have been largely responsible for the heating of grain, which has been so commonly reported the past fall.

ANIMAL AND HUMAN PESTS

The ox warbles (*Hypoderma bovis* DeG. and *H. lineata* DeV.) were less abundant than usual. *H. bovis* seems to be the prevalent species in the northern half of the state.

Mosquitoes (*Culicidae*) appeared in a veritable plague throughout central Indiana beginning September 18 and lasting a week. In the southern end of the state mosquitoes were reported abundant beginning a month or more earlier.

Fleas (*Ctenocephalus canis* Curt.) were very abundant and annoying throughout the state as evident by the numerous letters of inquiry. During June they were especially noticeable in dwellings and hog houses. In September they were unusually abundant, especially in dwellings in the southern two-thirds of the state.

Saddle-back caterpillar (*Sibine stimulea* Clem.) (fig. 10) was re-

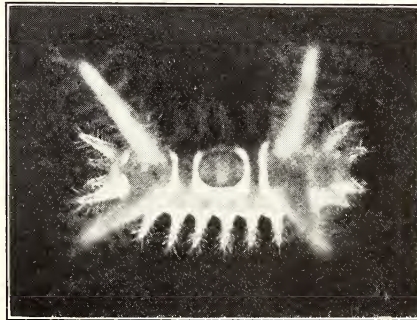


Fig. 10. The saddle-back caterpillar (*Sibine stimulea* Clem.) bears "stingings" hairs which cause an irritation and sometimes a rash when they puncture the skin. About one and one half times natural size.

ported as annoying, as described in our last year's records, from Greencastle, Martinsville, and Ft. Wayne between August 28 and September 7.

HOUSEHOLD INSECTS

Cockroaches continue to be abundant in dwellings, stores, cream stations and packing sheds, in spite of the simple and effective sodium fluoride treatment.

Ants were numerous as usual in lawns and gardens and especially as pests in dwellings.

MISCELLANEOUS INSECTS

Termites or white ants (*Reticulitermes flavipes* Koll.) continue as very serious pests of woodwork in buildings. It is most serious in southern half or two-thirds of the state but one report of damage came from Kendallville in the northeastern corner of the state.

Powder post beetle (*Lycetus* sp.) was reported as damaging woodwork more the past year than ever before, most of the reports coming from central and southern Indiana. Damage included joists and other timbers of buildings, chairs and rough hickory furniture.

Tobacco worms (*Protoparce quinquemaculata* Haw.) were abundant at Milltown the latter part of July.