Insects and Other Arthropods of Economic Importance in Indiana During 1966[1]

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Climatic conditions in Indiana during the growing season of 1966 fluctuated greatly both in time and space. These fluctuations caused considerable unevenness in the rates of crop and insect development which ultimately resulted in less damaging insect populations and lower crop yields in most regions of the state, when compared with 1965.

With the exception of March (+2.0°F) and the June 22-July 15 "heat wave," temperatures were mostly below normal throughout Indiana from January through September of 1966. May was extremely cool with temperatures ranging 3.4°F to 6.4°F below the 30 year average. These persistently low temperatures and the "hard freeze" on May 10 retarded crop and insect development considerably, as well as doing extensive damage to many fruits and vegetables throughout Indiana.

Precipitation was also below normal during much of 1966, and drought conditions prevailed in many areas during June, July and August. The most critical time of the summer was from June 22 through July 15, when extremely high temperatures were coupled with little precipitation. Evaporation during this period measured from 8.2 to 8.7 inches (from standard 4 feet diameter pan evaporimeters) on a statewide basis, while rainfall measured approximately 1.5 inches. This period of relatively severe moisture stress coincided with the beginning of grasshopper population build-ups, most noticeable potato leafhopper injury to alfalfa, maximum plant bug populations, the decline of aphid densities on most ornamentals, the collapse of pea aphid populations on alfalfa, and the decline of deer fly, horn fly and stable fly populations to the lowest levels of the season.

Corn and Small Grains

Black cutworm (*Agrotis ipsilon* (Hufnagel)) corn infestations were concentrated in the central districts, with the west central area having the highest number of infestations reported. In general, infestations were fewer and of less magnitude during 1966 than 1965. However, adult trap catches were heavier in 1966 than 1965, especially from the last week of June through the third week of July.

Variegated cutworm (*Peridroma saucia* (Hubner)). Damage was very light during 1966, and adult trap catches were well below those of 1965.

Cereal leaf beetle (*Oulema melanopus* (L.)). The new county records for 1966 were: Dearborn, Fayette, Franklin, Fountain, Hendricks, Johnson, Morgan, Montgomery, Parke, Putnam, Rush, Shelby and Union.

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In the New Carlisle area of LaPorte and St. Joseph counties, peak larval populations of 4-7/stem were present on oats during June 12-24. Adult emergence was mostly completed by July 8, and adults had begun going into aestivation by July 15.

During the week ending June 24, 1966, larval infestation on oats averaged up to 1/stem in some scattered fields in extreme northern Marshall county. In southwestern LaPorte county and northeastern Starke county, larval populations on oats averaged 22/100 sweeps, while in the area where the Kosciusko, Whitley and Noble county lines converge, larval population ranged from 1 per 10 feet of row to 1 per 3 feet of row in oats. In extreme northeastern Steuben county, larval populations on oats averaged 1 per 15 ft. of row the week of June 24, 1966.

The cereal leaf beetle while generally remaining at non-economic levels outside the New Carlisle area of LaPorte and St. Joseph counties, was more abundant throughout the north central and northeastern districts than in previous years. It is also worth noting that the cereal leaf beetle (for the first time) was observed to complete its life cycle on field corn in the New Carlisle area during 1966.

Due to the cold, wet weather in May, early activity of the cereal leaf beetle was delayed about 10 days from what has previously been observed. However, peak oviposition, larval activity, pupation and adult emergence occurred about the same time as in other years.

Chinch bug (*Blissus leucopterus* (Say)). Compared with the outbreak of 1965 (the heaviest in 15 years), chinch bugs were practically non-existent in Indiana in 1966. Adults and nymphs combined ranged 20-60 per border row corn plant (3-4 ft. high) on corn planted adjacent to wheat in the east central district. Economic infestations were reported from scattered areas of Allen, Whitley and Grant counties. In the northwestern and west central districts, no economic infestations were reported or observed during 1966.

Three periods of weather from July, 1965, through July, 1966, were largely responsible for the sharp decline of chinch bug densities. The latter half of the growing season of 1965 was cool and wet (a combination unfavorable for chinch bug development), so adult populations going into hibernation were not as heavy as would be expected after the severe first generation infestations. The adults that went into hibernation were subjected to a great deal of stress because very little snow cover was available during the winter of 1965-66, and there was one period when temperatures were never above freezing for nearly 3 weeks. Finally, May and early June of 1966 were cool and wet (a "hard freeze" occurred May 10), retarding first generation nymphal development and preventing large population buildups in small grains. These three weather periods apparently put enough stress upon the chinch bug that populations declined steadily from August 1965 through July 1966, and little economic damage occurred.

Corn earworm (*Heliothis zea* (Boddie)). Infestations were much lower in 1966 than in 1965. The fall corn insect survey revealed that 2.6 percent of the corn sampled was infested in 1966 compared with 11.6 percent in 1965. The heaviest infestations occurred in the southern

one-quarter of the state in 1966, where an average of 9.1 percent of the corn examined was infested.

With the exception of the northwest district (1.2% infested), all other areas of Indiana north of the southernmost one-quarter had infestations of less than 1%.

Corn leaf aphid (*Rhopalosiphum maidis* (Fitch)). On a state-wide basis, 4.0 percent of the corn plants sampled were severely infested, 12.4 percent were moderately infested, and 29.6 percent had light infestations. Maximum infestations (all classes) occurred in the southern one-quarter of the state, where an average of 73.3% of the plants sampled were infested. The northern three-quarters had an average infestation of 36.9%. The 1966 corn leaf aphid infestations were a complete reversal of 1965 when the northern three-quarters had an average infestation of 74%, and the southern one-quarter had an average infestation of 36%.

Because of the cool, wet weather in May, the poorly drained soils of the southern one-quarter remained unworkable longer than the northern soils and caused corn planting to be delayed longer than in the more northern areas. This delay, followed by relatively good growing conditions, caused the corn in the southern one-quarter of Indiana to be at a stage of development susceptible to aphid attack (tassel in whorl) at a time when in most years it is past the attractive stage (shooting tassels).

Droughty conditions throughout most of the northern three-quarters of Indiana resulted in much fewer infestations than in 1965 because indications are that the corn leaf aphid has a much better survival rate under moist conditions than under dry conditions.

European corn borer (*Ostrinia nubilalis* (Hubner)). Densities were slightly higher during 1966 than in 1965. On a statewide basis, 30.6% of the plants sampled were infested, and there were 44.3 borers per 100 plants. Corn losses due to corn borer were placed at 1.3% for 1966. In the southwestern district, first generation corn borer attacks were heavier than they have been for a number of years. Infestations ranging as high as 68% were common in Posey, Vanderburgh and Gibson during late June.

Garden symphylan (*Scutigerella immaculata* (Newport)). This centipede has been a serious pest of vegetables and other crops grown in greenhouses, but 1966 was the first year it caused losses to field corn in Indiana. Infestations ranging from 1 to 8 acres were found in field corn in Clinton, Shelby and Harrison counties, and significant yield losses resulted from this pest in each instance. In all three infested fields, the soil was quite loose and was high in organic content.

Hessian fly (*Mayetida destructor* (Say)). Field populations of Race B capable of infesting W38 resistant wheats (Dual, Monon, Redcoat, Riley) were slightly lower in 1966 than in 1965. Of the 317 certified fields sampled, 69% were infested in 1966 compared with an 84% infestation during 1965. The average 1966 infestation of W38 varieties was 7.6%, while the Race B resistant Knox 62 variety had an average infestation of less than 1%. The heaviest average infestations for W38 resistant wheat occurred in Knox county where 26.7% of the Monon, 41.7% of the Reed, and 24.0% of the Riley was infested.

Hessian fly research by U. S. D. A. entomologists at Purdue University has turned up what appears to be a 5th race of the Hessian fly in Indiana. However, much more research will have to be done before anything definite can be said about the characteristics of this apparent new race.

Japanese beetle (*Popillia japonica* (Newman)). New county record: Switzerland county.

Agricultural infestations were found for the first time ever outside the Kentland-Ade area of Newton county. Infestations on corn and soybeans occurred in areas of Cass, LaPorte, Kosciusko and Wabash counties. The Japanese beetle was one of the few Indiana insects which showed a population increase during 1966 when compared with 1965.

Northern corn rootworm (*Diabrotica longicornis* (Say)). Adult emergence began in Wabash River floodplain corn on July 6, while emergence in non-floodplain areas of central Indiana did not begin until the week of July 22. In late July, adults ranged 6-23/silk in scattered untreated corn fields throughout the central one-third of the state. In treated fields adults ranged 1-4/silk. Adults averaged 1-2/silk on 20 to 55% of the corn checked in the northern one-third during early August. In the southern one-third, adults were very light (0-2/silk) on 10 to 40% of the corn surveyed. Generally speaking, northern corn rootworm larval populations were low in 1966, and little corn lodging occurred.

Forage Legumes

Alfalfa weevil (*Hypera postica* (Gyllenhal)). During 1966 the alfalfa weevil was found in 30 new counties (Ohio, Monroe, Brown, Vigo, Vermillion, Parke, Putnam, Hendricks, Marion, Hancock, Henry, Wayne, Fayette, Union, Randolph, Delaware, Madison, Hamilton, Boone, Montgomery, Fountain, Tippecanoe, Warren, Benton, Newton, Lake, Jay, Adams, Allen and Steuben), and economic infestations occurred generally throughout the southern one-quarter of the state.

Larval populations in the Ohio River floodplain area of Harrison county reached a peak of 134 per sweep during the week of April 28 to May 5. In other areas of the southern one-quarter of Indiana, larval populations ranging from 50 to 130 per sweep were present during the period of May 24 to May 31. In scattered locations in extreme southern Morgan, Johnson and Shelby counties, larval populations of up to 33 per sweep were present during the same May 24 to 31 period. In the southern Montgomery and northern Parke and Putnam county areas of west central Indiana, larval populations of 3 to 4 per sweep were found during the period of June 2-9. In all other newly infested central and northern counties, alfalfa weevil populations were in trace numbers during 1966.

Based upon information obtained from county extension agents, it is estimated that 1,987,550 dollars were lost due to alfalfa weevil in the southern one-quarter of the state in 1966.

In 1967 it is expected that the alfalfa weevil will spread throughout the state and will become economically damaging in most areas of the southern one-half of Indiana.

Fall and early winter sampling of alfalfa (at 2 week intervals) in the Ohio River floodplain area of Harrison County resulted in total alfalfa weevil egg counts of 196 per square foot as of December 21, 1966. In the Seymour area of Jackson County, total egg counts of 53 per square foot were present on December 21, 1966.

It should be noted that peak larval densities probably occurred somewhat later than will be the case normally, because of the cool conditions which existed in Indiana during May of 1966 (see introduction).

Grasshoppers (*Melanoplus* spp.) were generally more abundant during 1966 than they have been for the past several years. Populations ranged 8-23/sq. yd. along roadsides in areas of the southeast and south central districts from late July through mid August. Adults and nymphs combined average 11/sweep on clover in the south central district during the same period. The red-legged grasshopper (*M. Femurrubrum* (DeGeer)) was the most common on a state-wide basis, while the differential grasshopper (*M. differentialis* (Thomas)) was next highest in abundance and was heaviest in the southern areas. In the northernmost areas of Indiana, the two-striped grasshopper (*M. bivittatus* (Say)) was the most common species in alfalfa during August.

Meadow spittlebug (*Philaenus spumarius* (L)). During late May nymphs ranged 4 per 10 stems to 1 per stem on alfalfa and clover in the south central and southeastern districts. Adults were common in these same areas during mid June, ranging to 12/sweep on alfalfa and up to 70/sweep in a few wheat fields adjacent to clover or alfalfa. In the northern one-third of Indiana, nymphs ranged 1-4/10 stems during mid June, and adults ranged 2-11/sweep on alfalfa and clover in mid July. In general, populations were moderate in Indiana during 1966, and were slightly lower than those of 1965.

Pea aphid (*Acyrthosiphon pisum* (Harris)). Populations on alfalfa and clover were light in the southern one-third throughout the growing season, reaching maximum densities of 24/sweep during the week ending June 17. In the northern one-half, populations ranged from 10-78/sweep during the period from May 27 to June 24. The heat wave from June 22 through July 15 caused pea aphid populations to collapse in the northern areas, and they remained very low until mid September when populations began their annual fall buildups. From late September through mid October populations ranged 12-65/sweep in northern Indiana alfalfa.

Potato leafhopper (*Empoasca fabae* (Harris)). Indiana populations reached maximum densities during the last three weeks of July when adults and nymphs combined ranged 6-40/sweep on alfalfa. In the north central and northwestern districts, light yellowing appeared in sandy soil areas during the week of July 8. In southern countries yellowing was conspicuous in light soil areas and on slopes and high spots during the week ending July 15. In the northern one-third, yellowing was moderate to heavy in late stage second growth alfalfa during the last week of July. Potato leafhopper damage and highest populations occurred during the extreme hot period in Indiana from June 22 through July 18, 1966.

Spotted alfalfa aphid (*Therioaphis maculata* (Buckton)). New county records (1965 and 1966): Bartholomew, Fulton, Kosciusko, Elkhart, Dearborn, Ripley, Jennings, Scott, Ohio, Franklin, and Noble counties.

Populations were light from May through August (3/5 sweeps-5/sweep) in the southern third of the state. However, during the week ending September 16, populations ranging from 22 to 116 per sweep were present in southwest district alfalfa. In southern Elkhart county, populations of 10-20/sweep were found the week of September 9.

Deciduous Fruits

Apple aphid (*Aphis pomi* (DeGeer)). Populations of this species were common in commercial orchards during the spring. They were readily controlled and reduced to non-economic proportions.

Apple leafhoppers. Feeding of leafhoppers on terminal branches of apple seedlings in a commercial nursery was noted. There was some reduction in growth until the grower applied control measures.

Apple maggot (*Rhagoletis pomonella* (Walsh)). On July 25, apple maggot adults were observed in an unsprayed orchard in the Vincennes area. To date, there have been no reports of any infestations of this species in commercially grown fruit. In general, this insect was more abundant in the northern one-half of Indiana than it has been for a number of years.

Catfacing insects. A low percentage of peach fruit was culled in packing sheds, due to catfacing. Catfacing insects include various species of stink bugs, tarnished plant bug (*Lygus lineolaris* (Palisot de Beauvois)), and plum curculio.

Codling moth (*Carpocapsa pomonella* (L.)). Very little loss to apples, grown commercially in Indiana, was reported. It remains, potentially, one of the major pests of apples in Indiana.

European red mite (*Panonychus ulmi* (Koch)). The freeze of May 9-10 delayed development somewhat but by mid-May most eggs had hatched. As in recent years, this pest proved to be of major importance to commercial orchardists. By mid-summer, many trees had populations sufficient to cause bronzing of the leaves.

Lesser peach tree borer (*Synanthedon pictipes* (G. & R.)). This insect continues to be the major pest to peach growers in southwestern Indiana. The species contributes to the premature decline and removal of peach trees which have been injured by winter freezing, crotch splitting, pruning, and other injuries. In Knox County, the first male of the season was captured on May 3, 1966. The insect has continual broods, with one to two generations per year. Peak emergency in 1966 occurred from June 20 to July 10 and from August 15 to September 4.

Oriental fruit moth (*Grapholitha molesta* (Busck)). The fruit moth was not a problem on peaches in southwestern Indiana when routine sprays were applied. Growers who neglected a spray program, due to loss of crop during the May freeze, experienced some flagging of terminal branches.

Peach tree borer (*Sanninoidea exitiosa* (Say)). This species, while present, was relatively unimportant in commercial peach orchards during 1966.

Plum curculio (*Conotrachelus nunuphar* (Hbst.)). This insect was a minor problem along the edges of commercial apple orchards adjoining woodlots.

Rosy apple aphid (*Dysaphis plantaginea* (Passerini)). Only a few reports of injury were received from commercial growers. Small populations were noted in unsprayed orchards, but these declined as the season progressed.

San Jose scale (*Aspidiotus perniciosus* (Comstock)). No reports of damage were received from commercial growers during the preceding season.

Shot-hole borer (*Scolytus regulosus* (Ratzeberg)). While present in unsprayed or neglected orchards, this insect is not currently a problem in properly sprayed orchards.

Two-spotted spider mite (*Tetranychus urticae* (Koch)). This species co-existed with European red mite in apple trees in mid-summer. While, initially, the population of this species was lower, it persisted for a longer time and reached a seasonal maximum at a later date than the European red mite.

Concern over defoliation and reduction in yield, spray costs and resistance to the available miticides remained among the most prominent of problems of the fruit grower.

Woolly apple aphid (*Eriosoma lanigerum* (Hausmann)). Small colonies were noted in neglected orchards but did no damage in commercial operations.

Orientals, Forest and Shade Trees

Bagworm (*Thyridopteryx ephemeraeformus* (Haworth)). This insect has shown a definite periodicity of abundance through the years in Indiana. The most recent heavy infestations occurred in 1956 and 1962, with 1956 reportedly having the heaviest populations on record. Since 1963, bagworm infestations have been increasing steadily, and the 1966 populations showed a continuation of this trend.

Columbian timber beetle (*Corthylus columbianus* (Hopkins)) populations, after dropping to very low levels during the years 1961-65, increased in Dubois county during the summer of 1966. Activity began a full month earlier in 1966 than in the previous year (June 11, '66 vs. July 17, '65), permitting the development of a third generation brood of beetles which did not occur in 1965. Should this generation successfully overwinter, widespread and intense activity may result in Dubois county in 1967.

Elsewhere in Indiana, the timber beetle seems to have halted and even reversed its slow northward spread. No traces of activity were observed in northern Owen county and the Bedford area of Lawrence county in 1966, both of which areas were first invaded during the heavy outbreaks to the south in 1959-60. However, activity was evident in Bartholomew county during 1966, an area which was also first invaded during the 1959-60 outbreak. Evidence of fairly heavy 1966 activity was also noted in northern Martin county and in the Tell City area of Perry county.

Elm leaf beetle (*Pyrrhalta luteola* (Muller)). While first and second generation larval infestations on Chinese elm were heavy during

1966, the second generation infestations were more noticeable due to generally dry conditions. This represented a reversal of the 1965 situation when first generation attacks were more noticeable than second generation attacks due to early season dryness.

Eastern tent caterpillar (*Malacasoma americanum* (Fabricius)). By April 22, webs were present on wild cherry and unkept apple and peach trees throughout the southern one-third of the state. Webs ranged 5-30/tree in the southermost counties. Larval populations in late April, 1966 were heavier than those of 1965 in the southern one-third of Indiana. However, freezing temperatures on May 10, 1966 and generally cool conditions during the rest of May delayed tree development causing high larval mortality. These observations were substantiated by much lower adult light trap catches in 1966 than 1965.

Fall webworm (*Hyphantria cunea* (Drury)). Very abundant in the extreme northern counties of the state as well as the south central and southwestern districts. Infestations during August ranged 2-18 webs per tree on walnut, hickory, cherry and sycamore, in the above areas, with heaviest infestations occurring in the southern districts.

European pine sawfly (*Neodiprion sertifer* (Geoffroy)). Populations are increasing steadily from low densities of 1964. Heavy infestations occurred on pine throughout areas of the northern one-half of Indiana during 1966.

Bronze birch borer (*Agrilus anxius*). Heavy infestations caused high mortality in white birch throughout Indiana.

Nursery and greenhouse pests—The eleven most frequently encountered pests (found in at least 20 nurseries) throughout Indiana in 1966 were as follows:

1. Aphids (124 nurseries); 2. spider mites (84); 3. Bagworms (70); 4. oyster shell scale (39); 5. bronze birch borer (38); 6. Fletcher scale (33); 7. fall webworm (30); 8. mealybugs (26); 9. leafhoppers (24); 10. Zimmerman pine moth (23); and 11. spruce needle miner (22).

The walkingstick (*Diapheromera femorata* (Say)) infestation in a 40 acre stand of mixed black and white oaks near Grovertown, Starke county, merits comment because it has been an annual occurrence since 1946. (This is in contrast with Michigan, Minnesota and Wisconsin populations which only appear in alternate years). The infestation was lighter during 1966 than in the previous 2 years, but 1967 spring populations are expected to be very heavy due to a long period of weather favorable for egg deposition in the fall of 1966. Egg laying began September 1, peaked September 15, continued at a moderate pace through October 6, and was not completely terminated until substantial snow-fall coupled with well below freezing temperatures occurred in late November.

An additional walkingstick infestation was discovered during the summer of 1966 in a 25 acre stand of mixed black and white oak 2 miles south of the 40 acre stand mentioned above.

Man and Animals

Mosquitos (species not reported) were reportedly quite annoying in many areas of Indiana during late May and early June, especially in the Evansville area.

Bloodsucking conenose (*Triatoma sanguisuga* (LeConte)). Adults and nymphs were collected in a cabin in Jackson county. Adults recorded biting a man on the hand May 21, and again on July 10, with resulting painful swelling and urticaria. Tests proved negative for Chagas disease.

Deer flies (*Chrysops* spp.). Very common and annoying throughout the state during the last 2 weeks of June. After July 5, populations declined and were no longer a problem.

Stable fly (*Stomoxys calcitrans* (L)). In contrast with the heavy middle and late season buildup during 1965, populations in 1966 were very light throughout Indiana.

Lone star tick (*Amblyomma americanum* (L)). The first Indiana occurrence of this tick on a human host was reported June 14 in Tippecanoe county. In addition, a heavy infestation was present on deer at the Crane Naval Depot, Martin county.

Face fly (*Musca autumnalis* (DeGeer)). This insect was generally scarce until mid August when population ranging 8 to 31/face (average 12) were observed on pastured cattle in the north central and northeastern districts. Infestations were light for the remainder of August through mid September in the northern one-half of the state, and populations ranged 0 to 15/face on pastured cattle.

Horn fly (*Haematobia irritans*). By June 10, 1966 population ranged 26-180/animal in west central Indiana. Infestations remained low until July 8 when populations peaked at 100-400/animal on pastured cattle in the Ohio River area, and 20-200/pastured animal in the northwest, north central and west central districts.

Household, Structural and Miscellaneous

Carpenter bee (*Xylocopa virginica* (L)). Infestations and damage reports in homes and out buildings were more numerous throughout Indiana during 1966 than in recent years.

Brood emergence began August 14 in Tippecanoe county, and extensive meconial staining occurred around nest entrances in timbers.

Crickets (*Nemobius* spp.). Extremely abundant from late August to mid September in the northern one-half of the state. Field populations as high as 20 per square foot were observed in corn, soybeans, and along roadsides. Movement into homes caused considerable annoyance in many areas.

Brown-banded cockroach (*Supella supellectillium* (Serville)). Reports of infestations in homes throughout Indiana increased during 1966.

Boxelder bug (*Leptocoris trivittatus* (Say)). Populations were very low in 1966, and reports of adult migrations into homes were rare.

TABLE 1
Other Cereal, Forage, and Vegetable Insects

Insect	Host	Locality	Degree of Problem—Remarks
Alfalfa plant bug			Moderate. Heaviest populations in northern ⅓ during
Adelphocoris lineolatus (Goeze)	Alfalfa	Statewide	mid July.
Armyworm			Extremely light. Only 3 infestations reported or ob-
Pseudaletia unipuncta (Haworth)	Grains	Statewide	served in 1966.
Asiatic oak weevil			Adults attacked tobacco. First Indiana report of this
Cyrtepistomus castaneus (Roelofs)	Tobacco	Harrison Co.	insect on tobacco.
Blister beetles			
Epicauta spp.	Alfalfa	Statewide	Extremely light.
A billbug			
Sphenophorus sp.	Corn	Statewide	Extremely light.
Bean leaf beetle			Moderate. Most beans showed some feeding during early June, but populations were generally non-
Cerotoma trifurcata (Forster)	Soybeans	Statewide	economic.
Cabbage maggot		Northern	
Hylemya brassicae (Bouché)	Cabbage	one-half	No reports of damage received.
Clover root curculio	Alfalfa		Moderate. Averaged 2/sweep on newly planted alfalfa
Sitona hispidula (Fabricius)	Clover	Statewide	during September.
Imported cabbage worm			
Pieris rapae (L.)	Cabbage	Statewide	Moderate. Late season buildup.
Cabbage looper			
Trichoplusia ni (Hübner)	Cabbage	Statewide	Moderate. Were a problem in September.
Colorado potato beetle		Southern	Light. A few fields in the southeast had heavy in-
Leptinotarsa decemlineata (Say)	Potatoes	one-half	festations during mid June.
Corn flea beetle			Light. Much less of a problem than 1965, especially
Chaetocnema pulicaria Melsheimer	Corn	Statewide	in southern Indiana.
Fall armyworm			Extremely light. Fifth consecutive year at non-eco-
Spodoptera frugiperda (Smith)	General	Statewide	nomic levels.
			Moderate. Destroyed 80 acres near Evansville, and

TABLE 1—Continued.

Other Cereal, Forage, and Vegetable Insects

Insect	Host	Locality	Degree of Problem—Remarks
Garden webworm		Southwest	larvae averaged 9/sweep in one area southwest of
Loxostege similalis (Guenee)	Alfalfa	district	Vincennes during early September.
Harlequin bug			
Murgantia histrionica (Hahn)	Cole crops	Statewide	Extremely light. No economic problems reported.
Hornworms			
Manduca sexta (Johannson)	Tomatoes	Southern	Light. Adult trap catches heavier than 1965. Most
M. quinquemaculata (Haworth)	Tobacco	three-quarters	abundant again in Greene County trap.
		North one-third	
		and	Heavy. Adults ranged 11-23 per chinch bug infested
Picnic beetles		east central	plant in east central district. In other areas, adults
Glischrochilus spp.	Corn	district	ranged 1-17/whorl in mid July.
Pale-striped flea beetle	Soybeans	Southern	
Systena taenita Melsheimer	Alfalfa, Corn	one-half	Extremely light. Much lower than 1965.
	Stored Potatoes		
Potato tuberworm	Greenhouse	Terre Haute	No reports of greenhouse or storage infestations being
Phthorimaea operculella (Zeller)	Tomatoes	Area	carried over from 1965.
Rapid plant bug			Light. Most abundant in south central district in late
Adelphocoris rapidus (Say)	Alfalfa	Statewide	May.
			Moderate. Began buildup on earworm and bird dam-
Sap beetles			aged corn in early August, especially in south central
Carpophilus spp.	Corn	Statewide	and southwest districts.
			Light. Most common in south one-third in late May.
Six-spotted leafhopper	Grains		Vector of aster yellows disease of leaf lettuce in La-
Macrosteles fascifrons (Stal)	Lettuce	Statewide	Porte area during early season.
Sod webworms			
Crambus spp.	Corn	Statewide	Light. Localized problem where corn followed sod.
Southern corn rootworm			Moderate. Began buildup in mid July. Ranged to
Diabrotica undecimpunctata howardi Barber	General	Statewide	6/sweep on alfalfa during late September to early October.

TABLE 1—Continued.
Other Cereal, Forage, and Vegetable Insects

Insect	Host	Locality	Degree of Problem—Remarks
Soybean cyst nematode		Southwest	
Heterodera glycines Ichinohe	Soybeans	district	Survey by state agency again gave negative results.
Stalk borer		Southern	Moderate. Up to 80% border row corn infested in areas of southcentral district in late June. Generally
Papaipema nebris (Guenee)	Corn	one-half	3-12% border row corn infested. Heavier than 1965.
A scarab beetle		Benton and	
Anomala innuba	Corn	Pike Counties	Adults up to 8/plant, but no damage observed.
Striped cucumber beetle		Sandy areas of South Central	Moderate. Unsprayed cucurbits suffered yield reduction
Acyllema vittata (Fabricius)	Cucurbits	and Southwest	from beetle feeding and bacterial wilt.
Tarnished plant bug			Moderate. More abundant on corn and soybeans than
Lygus lincolaris (Palisot de Beauvois)	General	Statewide	in past several years.
Tobacco flea beetle		Southern	
Epitrix hirtipennis (Melskeimer)	Tobacco	one-third	Light. Not a problem after being heavy in 1965.
		South Central	
Thrips (Thysanoptera)	Corn	Southwest	Light. Common during late June, but not a problem.
Vinegar flies	Ripening Fruit		Light. Not much of a problem due to generally dry
Drosophila spp.	and Vegetables	Statewide	conditions.
Wireworms			
Melanotus spp.	Corn	Statewide	Extremely light.
Yellow-striped armyworm		Southern	Extremely light. Larvae averaged 2/5 sweeps during
Prodenia ornithogalli (Guenee)	Alfalfa	St. Joseph Co.	mid August.

TABLE 2
Other Ornamental, Forest, and Shade Tree Insects

Insect	Host	Locality	Degree of Problem—Rewarks
Barberry webworm	Barberry		Extremely light. New *host* record established in 1965
Amphalocera dentosa Grote	Holly	Morgan Co.	when found attacking holly.
Black vine weevil	Rhododendron		
Brachyrhinus sulcatus (Fabricius)	Taxus	Statewide	Moderate. Locally heavy in Whitley Co.
Birch leaf miner			Ranked as 15th most encountered pest in nursery
Fenusa pusilla (Lepeletier)	Birch	Statewide	inspections.
Cankerworms	Apple, Elm	Statewide	Extremely light.
Cottony maple scale		Northwest	
Pulvinaria innumerabilis (Rathvon)	Silver Maple	corner	Locally heavy damage reported in Lake County.
Euonymus scale			
Unispis euonymi (Comstock)	Euonymus	Statewide	Heavy. Killing vines in some areas.
European pine shoot moth			
Rhyacionia buoliana		Northern	Moderate. Building up from low levels of 1964. Four-
(Schiffermuller)	Pine	districts	teenth most encountered pest in nurseries.
Fletcher scale	Arbor vitae		
Lecanium fletcheri Cockerell	Juniper, Yew	Statewide	Moderate. Populations higher than 1965.
Flatheaded apple tree borer			
Chrysobothris femorata (Oliver)	Maple	Statewide	Thirteenth most encountered pest in nurseries.
Giant hornet		Southern	State record established in 1965. No specimens ob-
Vespa crabro germana (Christ)	Lilac, Oak	counties	tained in 1966.
Holly leaf miner		Southern	
Phytomyza ilicis (Curtis)	Holly	counties	Heavy. Reported as far north as Grant County.
Hickory pouch gall			
Phylloxera caryae-venae Fitch	Hickory	Statewide	Moderate. Some hickories severely damaged.
Honey locust mite			Sixteenth most encountered pest in greenhouses and
Eotetranychus multidigituli Ewing	Iris	Statewide	nurseries.
Juniper tip midge	Cannert		
Oligotrophus sp.	Juniper	Statewide	Extremely light.
	Hawthorne		
	Lindera		

TABLE2—Continued.

Other Ornamental, Forest, and Shade Tree Insects

Insect	Host	Locality	Degree of Problem—Remarks
Lace bugs	Sycamore		Nineteenth wost encountered group of pests in nurs-
(Family Tingidae)	Rhododendron	Statewide	eries.
Lilac borer			
Podesesia syringae syringae (Harris)	Lilac	Statewide	Light.
Leaf roller			
Tortrix pallorama Robinson	Pine	Statewide	Light. Less damaging than in recent years.
Maple bladder gall			Moderate. Galls caused concern, but little actual
Vasates quadripedes (Shimer)	Silver Maple	Statewide	damage.
Maple petiole borer			
Caulocampus acericaulis			
(MacGillivray)	Sugar Maple	Statewide	Light. Damage reported in Crawfordsville area.
May beetle			
Phyllophaga sp.	Oaks	Statewide	Light.
Mimosa webworm			
Homodaula albizziae Clarke	Honey locust	Statewide	Moderate. Continued buildup from low of 1964.
Nantucket pine tip moth		Southern	Light. Apparently starting to rebuild after collapse of
Rhyaciona frustrana (Comstrock)	Pine	one-half	1964.
Oriental fruit moth	Apple, Cherry		
Grapholitha molesta (Busck)	Peach, Plum	Statewide	Seventeenth most encountered pest in nurseries.
Oystershell scale	Ash, Dogwood		Moderate. Heavy in Fayette County and in a few
Pepidosaphes ulmi (L.)	Redwood	Statewide	other localized areas.
Pales weevil			Moderate. Most damage occurred in southern one-half
Hylobius pales (Herbst)	Pine	Statewide	of state.
Pine bark aphid			
Pincus strobi (Hartig)	Pine	Statewide	Moderate.
Pine leaf aphid			Moderate. Especially noticeable where combined with
Pineus pinifoliae (Fitch)	Pine	Statewide	winter damage.
Pine needle scale			
Phenacaspis pinifoliae (Fitch)	Pine, Spruce	Statewide	Eighteenth most encountered pest in nurseries.

TABLE 2—Continued.

Other Ornamental, Forest, and Shade Tree Insects

Insect	Host	Locality	Degree of Problem—Remarks
Pissodes weevil *Pissodes affinis* Fitch	Pine	Southern counties	Heavy. Pest in cut-over pine land.
Rose chafer *Macrodactylus subspinosus* (Fabricius)	Roses	Northern one-third	Light. Scattered reports of damage in northern counties.
Sawflies (Family Tenthredinedae)	Hawthorne Peach, Pear Plum, Pine	Statewide	Twelfth most encountered pests in nurseries.
Sod webworms *Crambus* spp.	Turf	Statewide	Moderate. Adult trap catches were heavy, but little sod damage.
Southern pine engraver *Ips grandicollis* Eichh.	Pine	Statewide	Light. Heavy in areas where trees weakened by other sources.
Spruce spider mite *Oligonychus ununguis* (Jacobi)	Evergreens	Northern one-half	Heavy. Caused considerable damage early in season.
Smaller European elm bark beetle *Scolytus multistriatus* (Marsham)	American Elm	Statewide	Heavy in northern counties where elms present.
Sycamore lace bug *Corythucha ciliata* (Say)	Sycamore	Statewide	Extremely light.
Tuliptree callous borer *Euzophera ostricolorella* Hulst	Tuliptree	Northern one-half	Moderate. Locally damaging at Lafayette and Indianapolis.
Tuliptree scale *Toumeyella liriodendri* (Gmelin)	Tuliptree	Statewide	Moderate. Caused concern in Jennings and Fayette Counties.
White-marked tussock moth *Hemerocampa leucostigma* (Smith)	General	Statewide	Light. Of little concern in 1966.
Zimmerman pine moth *Dioryctria zimmermani* (Grote)	Pine	Northern one-half	Light. Caused concern in St. Joseph County.

TABLE 3
Other Livestock, Man, and Household Insects

Insect	Host	Locality	Degree of Problem—Remarks
Asiatic oak weevil *Cyrtepistomus castaneus* (Roelofs)	----------	Southern one-third	Extremely light. Reports of home invasions were quite numerous in 1965.
Bald-faced hornet *Vespula maculata* (L.)	----------	Statewide	Light. Well below levels of 1965.
Boxelder bug *Leptocoris Trivittatus* (Say)	----------	Statewide	Extremely light. Reports of home invasions rare in 1966 compared to 1965.
Cat flea *Ctenocephalides felis* (Bouché)	----------	Statewide	Light.
Cattle grubs *Hypoderma bovis* (L.) and *H. lineatum* (de Villers)	Cattle	----------	Light. Mostly a problem on western feeder stock brought into Indiana.
Cluster fly *Pollenia rudis* (Fabricius)	----------	Statewide	Light.
Dog ticks (American and Brown)	Animals Man	Statewide	Moderate. Most reports came from central areas.
German cockroach *Blattella germanica* (L.)	----------	Statewide	Moderate. Chief pest in eating and food processing establishments.
Horse fly *Tabanus atratus* (L.)	Cattle	East Central district	Light. Fourth year of low densities.
House fly *Musca domestica* L.	----------	Statewide	Light.
Larder beetle *Dermestes lardarius* L.	Dried foods	Statewide	Extremely light.

TABLE 3—Continued.

Other Livestock, Man, and Household Insects

Insect	Host	Locality	Degree of Problem—Remarks
Stable fly			
Stomoxys calcitrans (L.)	Cattle	Statewide	Light. Not a problem due to generally dry conditions.
Strawberry root weevil		Northern	Moderate. Not a statewide problem in homes as in
Brachyrhinus ovatus (L.)	----------	one-third	1965.
Subterranean termite	Wood		Reports of swarming were moderate. The major
Reticulitermes flavipes (Kollar)	Structures	Statewide	structural pest in Indiana.
Yellow jacket			
Vespula maculifrons (Buysson)	----------	Statewide	Light. Not the problem they were in 1965.
Japanese weevil		Northern	Moderate. Invaded homes in the Allen, LaPorte, and
Calomycterus setarius Roelofs	----------	one-third	St. Joseph County areas. More widespread than usual.
Picnic beetles			Moderate. A problem around homes, picnic and camp-
Glischrochilus spp.	----------	Statewide	ing areas.