

## The Insect Fauna of Apple Trees in Southern Indiana, 1956 and 1957

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Large blocks of trees, one in each of two apple orchards in Indiana, were maintained on ryania-lead arsenate insecticide and organic-fungicide spray schedules in 1956 and 1957 by grower cooperators to determine the degree of insect control that could be secured with such schedules. Control was compared with that in similar adjacent blocks sprayed with materials of the growers' choosing, chiefly DDT and organophosphorus insecticides and organic fungicides. One of these blocks, located in the Vincennes area, consisted of 20 acres of 6-year-old trees that had just begun to bear, which had not previously been heavily sprayed with chemicals known to be destructive to beneficial insects. The second block, near Linton, consisted of about 10 acres of mature trees that had been sprayed with DDT for 10 years and with parathion for the last 5 years. There was thus afforded an excellent opportunity to compare the effects of the markedly different conditions and exposures to spray chemicals on the insect fauna in the two blocks.

Twenty-eight collections were made in the two blocks. Collections from different apple varieties were combined and treated as one from each block; therefore, only nine collections are recorded from the two blocks. The insects were dislodged from the trees by application of a 57.2 percent pyrethrum-rotenone emulsifiable concentrate at 25 ounces per 100 gallons of water. After the first collection 3 pounds of a 25 percent malathion wettable powder was added to prevent revival and escape of some of the specimens.

The insects were collected from a 12 x 12 foot light-colored canvas sheet under the trees on the leeward side in 1956 and from two 1-square-yard frames covered with white muslin in 1957. The muslin-covered frames were superior to the canvas sheet. Recovery of insects was started 30 minutes after the sprays were applied. No effort was made to collect species that might not have been knocked from the trees by the spray.

The insects collected in the two blocks are given in Table 1. More insects were collected from the ryania-lead arsenate blocks than from the DDT-organophosphorus blocks, but the small numbers of many species give cause to doubt the significance of the differences.

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Insects Collected	Ryania—Lead Arsenate					DDT—Organic Phosphorus			
	Vincennes		Linton			Vincennes		Linton	
	Aug. 22 1956	June 19 1957	Aug. 16 1957	Aug. 23 1956	Aug. 27 1957	Aug. 22 1956	June 19 1957	Aug. 16 1957	Aug. 23 1956
<b>Lygaeidae</b>									
<i>Kleidocerys resedae</i>						1			
<i>Geocoris uliginosus</i> (Say)						1			1
<i>geminatus</i> Say									
<b>Miridae</b>									
<i>Ceratocapsus incisus</i> Knight					1				
<i>Chlamydatus associatus</i> (Uhler)	1								1
<i>Deracocoris nebulosus</i> (Uhler)	1			1					
<i>Eurychiloptera luridula</i> Reuter				7	3				1
<i>Halticus bracteatus</i> (Say)			13	1	7			1	1
<i>Hyaliodes harti</i> Knight	2	2		3	59				3
<i>vitripennis</i> var.									
<i>discoidalis</i> Reuter				13	7				
<i>Hyaliodes</i> spp.				3	10				
<i>Lygus lineolaris</i> (P.deB.)	2					1		7	3
<i>Phytocoris brevisculus</i> Reuter				17	7				
<i>Plagiognathus politus</i> var. <i>flavcolus</i> Knight	1								2
<i>Reuterocopus ornatus</i> (Reuter)				1	1				
<b>Nabidae</b>									
<i>Nabis rosipennis</i> Reuter	1			2					
<b>Pentatomidae</b>									
<i>Brochymena quadripustulata</i> (F.)	4	3		5	1				
<i>Euschistus servus</i> (Say)								1	
<i>variolarius</i> (P.deB.) sp.					1				1
<i>Mormidea lugens</i> (F.)				8					1
<b>Piesmidae</b>									
<i>Piesma cinerea</i> (Say)			1	1			2		3
<b>Tingidae</b>									
<i>Corythucha arcusta</i> (Say)						3			
<i>ciliata</i> (Say)				1					
<b>HOMOPTERA</b>									
<b>Aphidae Undet.</b>									
<i>Aphis</i> spp.	1	11		2			10		10
<i>Macrosiphum</i> spp.			9		16				
<i>Rhopalosiphum</i> spp.			1		1				
<i>Rhopalosiphum maidis</i> (Fitch)								3	
<i>Rhopalosiphum</i> sp.			1						
Aphini					3				
<b>Cercopidae</b>									
<i>Philaenus leucophthalmus</i> (L.)		8		14	4	1			12
<b>Cicadellidae Undet.</b>									
<i>Aceratagallia</i> sp.			13					8	
<i>Agallia consticta</i> (Van D.)			1		1				
<i>Balclutha</i> sp.		1							
<i>Dikraneura</i> sp.					2				
<i>Empoasca fabae</i> (Harris)		1	3						
<i>Endria mimica</i> (Say)		1						1	



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	Aug. 22 1956	June 19 1957	Aug. 16 1957	Aug. 23 1956	Aug. 27 1957	Aug. 22 1956	June 19 1957	Aug. 16 1957	Aug. 23 1956
Coccinellidae Undet.					X*			X	
<i>Adalia bipunctata</i> (L.)				X					
<i>Cephaloscymnus zimmermanni</i> Cr.				X					X
<i>Chilocorus stigma</i> (Say)				X					
<i>Coleomagilla maculata</i> (DeG.)				X					
<i>Cycloneda munda</i> (Say)		X							
<i>Hippodamia convergens</i> Guér.		X							
Sp.			X						
<i>Hyperaspis undulata</i> (Say)				X					X
<i>Microweisea misella</i> (Lec.)				X					X
<i>Psyllobora 20-maculata</i> (Say)				X					
<i>Stethorus punctum</i> (Lec.)	X	X	X					X	X
Corylophidae Undet.					1				
Curculionidae									
<i>Anthonomus nigrinus</i> Boh.				1					1
<i>Smicronyx</i> spp.	1	2	2			1	2		
Histeriidae									
<i>Hister</i> sp.						1			
* "X" indicates occurrence of species—exact number collected not available.									
Lampyridae Undet.									1
Lathridiidae									
<i>Melanphthalma</i> sp. pr. <i>distinguenda</i> (Com.)				1					
<i>Melanphthalma</i> spp.		4	2	1	1			1	
Corticarini							1		
Meloidae									
<i>Epicauta pestifera</i> Werner	2								
Nitidulidae									
<i>Cryptarcha ? strigatula</i> Pars.								1	
Phalacridae Undet.	1								1
Scaphidiidae									
<i>Scaphisoma</i> or <i>Baeocera</i> sp.				1					
Staphylinidae Undet.	2		1	2	1	2			4
Tenebrionidae									
<i>Tribolium castaneum</i> (H.) sp.1				1		1			
TRICHOPTERA Undet.	1		1	1	1				
LEPIDOPTERA									
Blastobasidae Undet.					3				
Coleophoridae									
<i>Coleophora</i> sp.				1					
Crambidae Undet.								1	
Gelechiidae Undet.					1				
Geometridae Undet.					2				
Gracilariidae Undet.					1				
<i>Callisto</i> sp.			1						10



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	Aug. 22 1956	June 19 1957	Aug. 16 1957	Aug. 23 1956	Aug. 27 1957	Aug. 22 1956	June 19 1957	Aug. 16 1957	Aug. 23 1956
<i>nudiuscula</i> (Lw.)					2			1	
<i>umbrosa</i> (Lw.)		1	6	2	1		1	1	
sp.		1							
<i>Thaumatomyia bistriata</i> (Walk)					3				
<i>glabra</i> (Mg.)	7	5	12	16	15	4	5	4	41
<i>Tricimba trisulcata</i> (Ad.)	1	1	1					1	1
Culicidae									
<i>Aedes vexans</i> (Mg.)		4							
Dolichopodidae Undet.	1				2				1
<i>Chrysotus</i> spp.					1				2
<i>Condylostylus siphon</i> (Say)			1					1	
spp.	4		2	6	1	7			9
<i>Medetera</i> spp.	2		6		1				2
<i>Paraphrostylus</i> sp.					5				
<i>Sciapus</i> sp.		2							
Dorilaidae Undet.					4				
<i>Tömösváryella</i> sp.				3					
Drosophilidae									
<i>Chymomyza amoena</i> (Loew)	2			1	2			1	10
<i>Drosophila melanogaster</i> (Mg.)					2				
spp.					1		2		
<i>Leucophenga</i> sp.				1					
<i>Scaptomyza</i> sp.	1	2						1	2
Empididae									
<i>Drapetis</i> spp.			1	1				6	1
Fungivoridae Undet.	5	3				1			1
<i>Polylepta</i> spp.			2					1	
<i>Zelmira</i> sp.					2				
Heleidae									
<i>Atrichopogon</i> sp.				1			1	1	
<i>Culicoides crepuscularis</i> Mall.			1						
<i>Culicoides stellifer</i> (Coq.)					1				
<i>Dasyhelea</i> spp.	1					1			
Larvaevoridae Undet.	1			2	1				3
<i>Actia</i> sp.					1				1
<i>Archytas apicifer</i> Walk.									1
<i>Chaetophlepsis tarsalis</i> Tns.				2					3
<i>Gymnosoma fuliginosa</i> R. D.				1					
<i>Houghia selipennis</i> Coq.				1					
<i>Myiophasia</i> sp.					1				
<i>Paradidyma singularis</i> (Tns.)					1				
<i>Pseudochaeta</i> sp.									1
<i>Wagneria helyma</i> (Walk.)				1					
<i>Wagneria</i> sp.					1				
<i>Winthemia rufopicta</i> (Big)									1
<i>Winthemia</i> spp.			1		1				

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<b>Lauxaniidae</b>									
<i>Homoneura nubila</i> Mel.				3					1
<i>Homoneura</i> sp.				1					
<i>Minettia lupulina</i> (F.)									1
<i>Minettia</i> spp.	1			2		1			2
<i>Sapromyza</i> spp.			1					2	
<b>Lonchaidae</b> Undet.									
<b>Lycoriidae</b>									
<i>Bradysia</i> spp.			8	1		1	1		1
<b>Milichiidae</b>									
<i>Phyllomyza</i> spp.				1	1				
<b>Muscidae</b>									
<i>Coenosia</i> spp.			3	1			1		2
<i>Helina</i> sp.					1				
<b>Odiiniidae</b>									
<i>Odinia</i> sp.									1
<b>Otitidae</b>									
<i>Enxesta notata</i> (Wied)				1		1			
<b>Phoridae</b> Undet.									
<i>Megaselia</i> spp.			6		2	1		2	4
<b>Sarcophagidae</b>									
<i>Sarcophaga bullata</i> Parker									1
<i>derelecta</i> Walk.				2	2			1	1
<i>galeata</i> Ald.	1							2	1
<i>hunteri</i> Hough						1			
<i>impar</i> Ald.									1
<i>ochracea</i> Ald.					1				
<i>rapax</i> Walk.				1	3	1		1	10
<i>ventricosa</i> V. deW.			2	5	12	1		3	22
( <i>Chaetoravinia</i> ) sp.								1	
spp.			1		2				
<b>Sciomyzidae</b>									
<i>Dicta</i> sp.					1				
<i>Pherbellia nana</i> (Fall.)						1			
<b>Sphaeroceridae</b>									
<i>Leptocera fontinalis</i> Fall.	1				3				6
spp.			1	3				3	1
<b>Stratiomyidae</b>									
<i>Sargus</i> sp.				1					
<b>Syrphidae</b>									
<i>Allograpta obliqua</i> (Say)						2		1	
sp.									1
<i>Mesograpta geminata</i> (Say)				1				1	
<i>marginata</i> (Say)	5	1	4	11	3		3	3	12
<i>polita</i> (Say)				3				3	
<b>Tendipedidae</b> Undet.									
<i>Tepides</i> sp.					2	4			3
			12						





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Ceraphronidae									
<i>Aphanognmus</i> sp. 1									
<i>Lygocerus</i> sp. 1									
Chalcididae									
<i>Brachymeria hammari</i> (Cwtd.) 1									
<i>Spilochalcis side</i> (Walker) 1									
Cynipidae									
<i>Callaspidia provancheri</i> Ashm. 1									
<i>Ceroptres</i> sp. 1									
<i>Charips</i> sp. 1									
<i>Hexacola</i> spp. 3 1 11									
<i>Kleidotoma</i> (Kleidotoma) sp. 1									
<i>Trybliographa</i> (Trybliographa) sp. 1									
Diapriidae									
<i>Phaenopria</i> sp. 1									
Elasmidae									
<i>Elasmus albicoxa</i> Haw 2									
Encyrtidae									
<i>Achrysoophagus dactylopii</i> (How.) 1									
<i>Anagyrus</i> sp. 1									
<i>Aphycus maculipes</i> How. <i>rileyi</i> Timb. 2									
<i>Blepyrus</i> sp. 2									
<i>Bothriothorax</i> sp. 1									
<i>Cerchysius marylandicus</i> Grt. 2									
<i>Chrysopophagus compressicornis</i> Ashm. 1									
<i>Clausenia</i> sp. 2									
<i>Copidosoma truncatellum</i> (Dalm.) 1 3 5									
<i>Discoides</i> sp. 3									
<i>Homalotylus terminalis</i> (Say) 1 1 5 1 3 2									
<i>Ooencyrtus johnsoni</i> (How.) 1									
<i>Syrphophagus</i> sp. 1									
<i>Xanthoencyrtus</i> sp. 1									
Eulophidae									
<i>Aphelinus mali</i> (Hald.) <i>semiflavus</i> How. 1									
<i>Chrysocharis</i> spp. 1 1 11 6									
<i>Cirrospilus flavinctus</i> Riley 1									
<i>Emersonopsis</i> sp. 1									
<i>Eulophus orgyiae</i> (Fh.) 1									





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<i>Pachyneuron</i> sp.									1
<i>Rhopalicus</i> sp.								1	
<i>Sphegigaster</i> sp.									1
<i>Sphegigasterini</i>		5				2			
<i>Tomicobia</i> sp.				1					
<i>Zatropis</i> sp.						1			
Scelionidae									
<i>Leptacis</i> sp.					2				
<i>Telenomus podisi</i> Ashm. spp.			2	2				5	
<i>Trichasius</i> sp.		2			6			1	
<i>Trimorus</i> sp.						2			1
<i>Trissolcus brochymnae</i> (Ashm.)					1			1	6
<i>euschisti</i> (Ashm.)								3	2
<i>podisi</i> Ashm. spp.				3	1				7
	1		3	5				4	
Sphecidae									
<i>Crossocerus ambiguus</i> (Dahlb.)				1					2
<i>impressifrons</i> (Sm.) spp.				2					
				2					
<i>Ectemnius lapidarius</i> (Panz.)									1
<i>stirpicola</i> (Pack.)									1
<i>Euplius rufigaster</i> (Pack.)					1				
<i>Ochloptera bipunctata</i> (Say)									1
<i>Pemphredon</i> sp.				1					
Tiphiidae									
<i>Tiphia egregia</i> Mall. <i>waldenii</i> (Vier.)					1				1
Torymidae									
<i>Liodontomerus longfellowi</i> (Grit.)				1		1			