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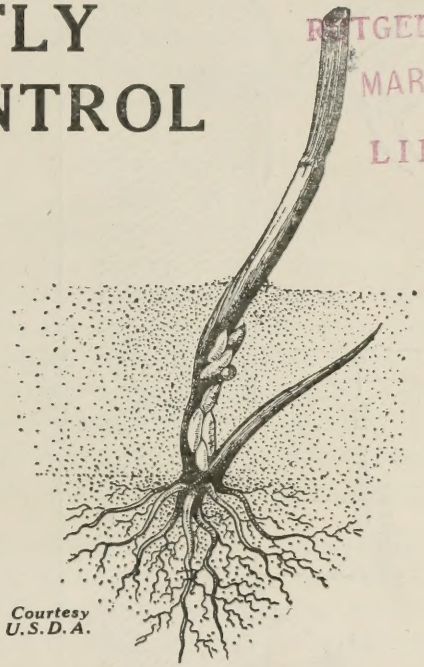
HESSIAN FLY CONTROL



Courtesy U.S.D.A.

Hessian Fly Maggots Beneath Sheath in the Soil (enlarged)

By

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The Ohio State University

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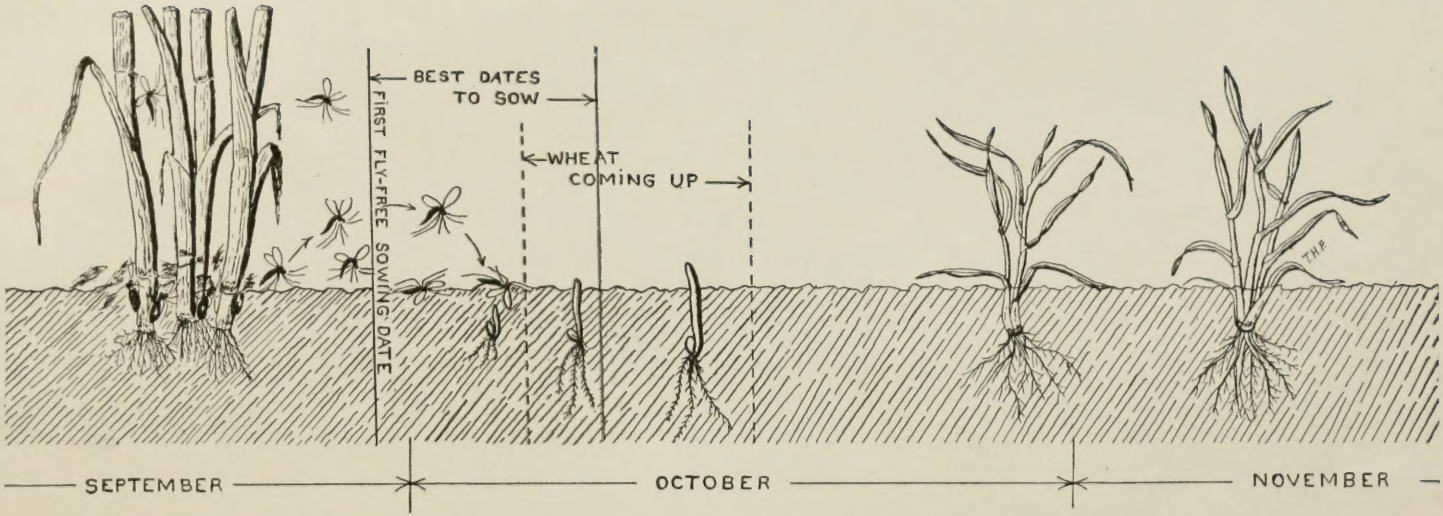


HOW TO OUTWIT THE HESSIAN FLY

Adult Hessian flies emerge in the autumn from buried flaxseeds in wheat and barley stubble. They live only a few days and migrate in search of young wheat. The illustration shows wheat, planted after the fly-free date, coming up after the adults have perished without finding young wheat. See pages 5, 6 and 7 for average safe-sowing dates for your county.

HESSIAN FLY CONTROL

T. H. PARKS,
Extension Entomologist

THE Hessian fly is a serious insect pest of wheat in Ohio. It is present every year to some extent, but becomes a community menace periodically when favorable conditions for its rapid multiplication are present. Included in such conditions is an abundant food supply in the fall, which it is now known is within the power of the farmer to withhold.

The purpose of this bulletin is briefly to state the habits of the insect, and present by counties wheat sowing dates that have been determined thru five years of study, to be safe dates to follow in order to prevent serious damage from the pest.

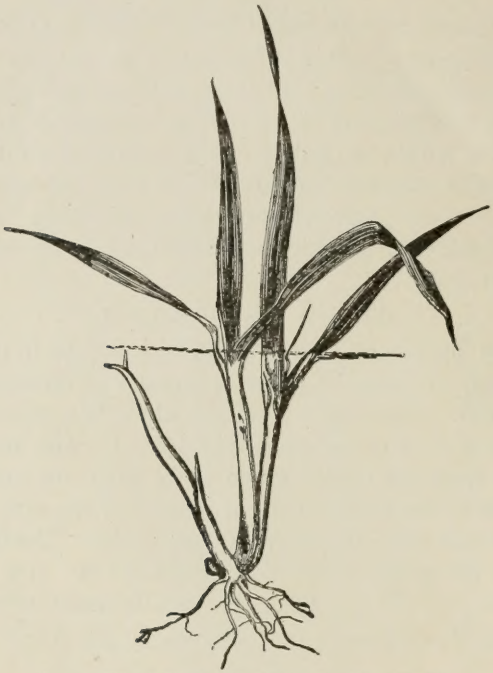
Habits of the Insect

The Hessian fly passes thru four definite stages in its development. These are the egg, the larva or maggot, puparia or flaxseed, and adult or mosquito-like form. The eggs are laid in chain-like rows in the grooves of the upper surfaces of the young wheat leaves. The maggots feed by sucking the sap from the tender green stalk near its junction with the root, or near one of the lower nodes or joints. They are found by stripping away the outer basal leaves from the stalks. The flaxseed stage is always found in the position where the maggot fed. It is not capable of moving from one place to another. The adults resemble small mosquitoes and emerge from the pupariae or flaxseeds to lay their eggs upon the leaves.

There are two generations of the insect annually in Ohio. Adults emerge in the spring from flaxseeds overwintering in early sowed or volunteer wheat. The eggs are laid in April or May. Each female lays an average of about 230 eggs. During May or June, the larvae or maggots feed at the sides of the stem near one of the lower joints, causing a depression or cavity in the stem at the point of feeding. This may cause the straw to bend or break at this point, which is usually at or near the surface of the ground. Lodging of the straw continues until harvest, resulting in many heads remaining upon the ground with the stubble.

Several larvae feeding on one stalk may stunt or kill it before the head is formed. In such cases it usually collapses, and the flaxseeds which have developed on it, as well as those which have become dislodged from broken-over mature straws, become buried beneath the soil surface. Here they remain thruout the summer well protected from their parasitic insect enemies. It is from these buried flaxseeds that the fall generation of adults emerges to infest the young wheat above the ground at that time.

This emergence of adults occurs in September and early October. They lay eggs upon the early sowed or volunteer wheat. The newly hatched maggots soon work their way to the sides of the tender stalk below ground. They may be so numerous as to kill the plant during the fall. In other cases the plant may become so weakened that it is unable to withstand the winter.



Young Wheat Plant Infested by the Hessian Fly.

Under conditions of severe infestation the early sowed wheat fails to respond to the touch of spring. The plants are either dead or crippled, and the leafsheaths surrounding the decaying stems are packed with the flaxseeds of the Hessian fly. This will constitute a menace to the uninfested fields of wheat. Under conditions of mild infestation, the early sowed wheat will make a fair yield, but in addition rear a sufficient number of the Hessian flies to make the job of control more difficult during the following year.

Besides wheat, the insect attacks barley and rye. Barley is almost as seriously damaged as wheat. While the eggs are laid on rye in abundance, but few larvae develop to damage this crop in Ohio.

The Hessian fly has a number of insect parasites which lay their eggs and develop upon and within its immature stages. While parasites each season destroy a high percentage of the flaxseeds present, they are at most only an aid and apparently cannot be depended upon to put down an outbreak.

Average Safe-sowing Dates by Counties

Counties	Rank in Wheat Acreage 1922	Period of Seeding to Avoid Hessian Fly Damage and Winter Injury
Northwest—		
Allen	55	Sept. 26 – Oct. 5
Defiance	44	Sept. 24 – Oct. 3
Fulton	41	Sept. 22 – Oct. 1
Hancock	11	Sept. 25 – Oct. 4
Henry	36	Sept. 24 – Oct. 3
Lucas	67	Sept. 23 – Oct. 2
Paulding	81	Sept. 24 – Oct. 3
Putnam	47	Sept. 25 – Oct. 4
Van Wert	86	Sept. 25 – Oct. 4
Williams	40	Sept. 22 – Oct. 1
Wood	25	Sept. 24 – Oct. 3
North Central—		
Ashland	17	Sept. 25 – Oct. 4
Crawford	29	Sept. 25 – Oct. 4
Erie	50	Sept. 24 – Oct. 3
Huron	21	Sept. 24 – Oct. 3
Lorain	35	Sept. 24 – Oct. 3
Ottawa	64	Sept. 23 – Oct. 2
Richland	22	Sept. 25 – Oct. 4
Sandusky	19	Sept. 24 – Oct. 3
Seneca	3	Sept. 24 – Oct. 3
Wyandot	32	Sept. 25 - Oct. 4
Northeast—		
Ashtabula	78	Sept. 21 – Sept. 30
Columbiana	48	Sept. 25 – Oct. 4
Cuyahoga	82	Sept. 23 – Oct. 2
Geauga	84	Sept. 23 – Oct. 2
Lake	87	Sept. 21 – Sept. 30
Mahoning	62	Sept. 24 – Oct. 3
Medina	37	Sept. 24 – Oct. 3
Portage	51	Sept. 24 – Oct. 3
Stark	7	Sept. 25 – Oct. 4
Summit	49	Sept. 24 – Oct. 3
Trumbull	65	Sept. 23 – Oct. 2
Wayne	1	Sept. 25 – Oct. 4
West Central—		
Auglaize	39	Sept. 26 – Oct. 5
Champaign	30	Sept. 28 – Oct. 7
Clark	33	Sept. 29 – Oct. 8
Darke	12	Sept. 28 – Oct. 7
Hardin	58	Sept. 26 – Oct. 5
Logan	57	Sept. 27 – Oct. 6
Mercer	60	Sept. 26 – Oct. 5
Miami	20	Sept. 29 – Oct. 8
Shelby	45	Sept. 27 – Oct. 6

Average Safe-sowing Dates by Counties—(Continued)

Counties	Rank in Wheat Acreage 1922	Period of Seeding to Avoid Hessian fly Damage and Winter Injury
Central—		
Delaware	28	Sept. 27 – Oct. 6
Fairfield	8	Sept. 30 – Oct. 9
Fayette	26	Oct. 1 – Oct. 10
Franklin	9	Sept. 29 – Oct. 8
Knox	16	Sept. 27 – Oct. 6
Licking	15	Sept. 28 – Oct. 7
Madison	27	Sept. 29 – Oct. 8
Marion	46	Sept. 26 – Oct. 5
Morrow	34	Sept. 26 – Oct. 5
Pickaway	2	Sept. 30 – Oct. 9
Ross	4	Oct. 2 – Oct. 11
Union	31	Sept. 27 – Oct. 6
East Central—		
Belmont	66	Sept. 29 – Oct. 8
Carroll	63	Sept. 26 – Oct. 5
Coshocton	38	Sept. 27 – Oct. 6
Harrison	79	Sept. 27 – Oct. 6
Holmes	22	Sept. 26 – Oct. 5
Jefferson	80	Sept. 27 – Oct. 6
Tuscarawas	42	Sept. 26 – Oct. 5
Southwest—		
Butler	5	Oct. 2 – Oct. 11
Clermont	69	Oct. 3 – Oct. 12
Clinton	14	Oct. 2 – Oct. 11
Greene	18	Sept. 30 – Oct. 9
Hamilton	61	Oct. 3 – Oct. 12
Montgomery	6	Sept. 30 – Oct. 9
Preble	13	Sept. 30 – Oct. 9
Warren	23	Oct. 2 – Oct. 11
South Central—		
Adams	54	Oct. 4 – Oct. 13
Brown	52	Oct. 4 – Oct. 13
Gallia	77	Oct. 4 – Oct. 13
Highland	10	Oct. 3 – Oct. 12
Jackson	76	Oct. 3 – Oct. 12
Lawrence	88	Oct. 5 – Oct. 14
Pike	59	Oct. 3 – Oct. 12
Scioto	68	Oct. 4 – Oct. 13
Southeast—		
Athens	83	Oct. 2 – Oct. 11
Guernsey	71	Sept. 29 – Oct. 8
Hocking	70	Oct. 1 – Oct. 10
Meigs	74	Oct. 3 – Oct. 12
Monroe	75	Sept. 30 – Oct. 9
Morgan	72	Oct. 1 – Oct. 10
Muskingum	43	Sept. 29 – Oct. 8
Noble	73	Sept. 30 – Oct. 9
Perry	56	Sept. 30 – Oct. 9
Vinton	85	Oct. 2 – Oct. 11
Washington	53	Oct. 2 – Oct. 11

Wheat Yields Secured at the State and County Experiment Farms from Different Dates of Seeding

Place and Date	Rank in Yield	Yield Per Acre
Wooster—(16 year's average)		
Sept. 7-8	4	29.5 bu.
14-15	3	32.1 bu.
21-22	1	34.1 bu.
28-29	2	32.7 bu.
Oct. 5-6	5	28.5 bu. (15 years)
12-13	6	26.3 bu.
19-20	7	20.9 bu. (14 years)
26-27	8	18.2 bu.
Trumbull County—(4 year's average)		
Sept. 1-3	4	30.3 bu.
8-9	3	31.1 bu.
15-18	2	31.8 bu.
22-23	1	33.1 bu.
Oct. 1-2	5	29.8 bu.
7-10	6	17.9 bu.
Miami County—(8 year's average)		
Sept. 8	3	23.8 bu. (4 years)
15	6	20.5 bu. (7 years)
22	4	23.1 bu.
29	1	26.1 bu.
Oct. 6	2	25.5 bu.
13	5	21.7 bu.
20	7	15.2 bu. (7 years)
Clermont County—(7 year's average)		
Sept. 15	5	14.0 bu. (6 years)
22	4	14.2 bu.
29	3	15.3 bu.
Oct. 5-6	1	16.9 bu.
12	2	16.0 bu.
19	6	14.0 bu. (6 years)
26-28	7	12.3 bu.
Meigs County—(6 year's average)		
Sept. 7-9	6	21.6 bu. (4 years)
13-16	5	23.9 bu. (4 years)
20-25	2	27.5 bu.
27-1	1	28.5 bu.
Oct. 5-7	3	27.4 bu.
13-15	4	25.1 bu.
20-22	7	20.9 bu.

Control

The best method for the Ohio farmer to use in avoiding damage from the Hessian fly is the *date of sowing* his crop. Adult Hessian flies come from the underground flaxseeds in the stubble fields during the latter half of September. In central and southern counties this emergence is usually continued into the first week of October. By having no wheat above ground during this time, the flies, for want of green plants, are unable to deposit their eggs near food where the young can develope.

The best date to commence sowing wheat is the date which will allow the wheat to come up immediately after the adult Hessian flies are dead. For average seasonal climatic conditions, this is now known for the different counties. It is called "fly-free date." The ten days following the fly-free date are known as the best safe-sowing dates, and are dates during which wheat has been sowed and has given near the maximum yield in years even when Hessian fly damage was absent.

For best results the seedbed should be well prepared and fertilized. This will contribute to a well developed root system before the approach of winter.

Sowing later than the dates advised is poor practice. When later sowing is necessary because of rains, the importance of a well prepared and fertilized seedbed is emphasized. During most seasons the average farm land prepared for wheat can be seeded within the ten-day period.

County-wide cooperation in observing safe-seeding dates is important and has been demonstrated. Two percent of the wheat acreage of a county which was sowed too early in 1921, served to perpetuate the Hessian fly as a serious menace in the fall of 1922.

Lack of neighborhood cooperation, should not prevent the individual from deriving much benefit by observing the proper seeding dates. By so doing he escapes fall damage but must feed the "overflow" from his neighbor's field during the spring. Let his motto be "No early wheat, no fall brood; no fall brood, no spring brood; no spring brood, no summer damage."