

**TENTH ANNUAL REPORT OF THE
STATE ENTOMOLOGIST
OF MINNESOTA TO THE
GOVERNOR FOR THE YEAR 1905**

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Tenth Annual Report of the State Entomologist of Minnesota to the Governor for the Year 1905
by Various

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TENTH ANNUAL REPORT

OF THE

STATE ENTOMOLOGIST

OF

MINNESOTA

TO THE GOVERNOR

FOR THE YEAR 1905.

FOURTH ANNUAL REPORT OF F. L. WASHBURN.

AGRICULTURAL EXPERIMENT STATION,
ST. ANTHONY PARK, MINN.
DECEMBER, 1905.

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LETTER OF TRANSMITTAL.

STATE EXPERIMENT STATION.

Dec. 1, 1905.

His Excellency, John A. Johnson, St. Paul, Minn.

DEAR SIR: It gives me pleasure to present to you herewith the tenth annual report from this department.

This has been a year of surprises in that certain destructive pests have been unexpectedly active, while others which we will always have with us and which usually work havoc each year have done little or no injury during the past season. The Hessian Fly has been present on grains and grasses, but to a limited extent, not sufficiently noticeable to cause complaint. It is safe to say, however, that this insect will be more noticeable the coming season, and will, if climatic conditions favor, increase in numbers each year for several seasons, until it reaches its climax in numbers and injury done, after which it will practically disappear, as it has this season, only to repeat the same phenomenon later. This periodic increase and decrease in the numbers of this, probably our most serious grain pest in Minnesota, is due largely to the presence of parasitic insects which prey upon it. As the Hessian Fly increases in numbers, so does its parasites, until the latter get the upper hand, and the fly disappears. But in the killing of its host the parasite has destroyed its food supply, and hence its numbers are materially lessened, giving the Hessian Fly another chance. It is estimated that the average annual loss in the United States alone, due to this fly, amounts to nearly \$50,000,000, and about five years ago it raised that tax to \$100,000,000 for one year, Ohio and Indiana contributing \$24,000,000 of that sum. The Chinch Bug, companion pest of the Hessian Fly, has been conspicuous by its absence, though a few were reported from one or two localities. This insect, also while sparing us this year, will visit us again in destructive

numbers. The United States loses annually, on an average, at the hands of the Chinch Bug nearly \$100,000,000. Of other wheat insects, the Wheat Stem Maggot, *Meromyza americana*, has been taken in considerable numbers, and the occurrence of the Joint Worm has been reported to this office. These two latter pests, as well as the Frit Fly, are undoubtedly with us, though not in sufficient numbers as yet to be destructive.

I have to report quite a serious loss to farmers who would raise alfalfa seed through the voracious appetite of the Red-legged Grasshopper or Locust, *Melanopus femur rubrum*, which prevented the formation of seed on many acres in Hennepin county. This was not reported to the entomologist until the damage was done; in fact, the farmers themselves did not realize the havoc which was quietly going on in their fields until too late to prevent it. I have little doubt but that next season, fore-warned as we are, a repetition of this can be prevented.

Early in the summer various species of cut worms were reported bad in certain sections, flax growing districts being perhaps the worst sufferers. No specimens reached us with the complaints. We have in Minnesota over two hundred species of caterpillars commonly referred to as "cut worms." In June many inquiries reached us regarding galls on plum leaves. This trouble was caused by a small mite known as *Eriophyes padi*. It has been troublesome before this date, being reported from Minnesota in 1884. The Cottony Maple Scale, *Pulvinaria innumerabilis*, has been again a serious pest. It has been discussed and remedies given in a previous report from this department; we have every reason to believe that it will be finally conquered by parasites and predaceous insects. The Stalk Borer, *Papaipema nitela*, has been destructive again, as has the corn worm, *Heliothis armigera*, the cotton boll worm of the South. A serious report of this pest reached us from Cannon Falls, where "every other ear" was said to be infested. No complaint has reached us this season of the Grain Plant Louse, an insect which caused wheat growers some alarm last year. We have had our usual quota of green cabbage worms, potato beetles, and insects affecting squashes and melons. Potato beetles were reported as being especially bad in the northern part of the Red River Valley. The striped cucumber beetle has been kept in check by

dusting air slaked lime on the plants. The White Grub, larva of *Lachnosterna*, sp., has ravaged lawns to a marked extent, its injuries being particularly noticeable in cemeteries and like situations, where large tracts of grass make it a difficult pest to conquer. The robins are amongst our best friends in waging war on this pest, since they find and eat many of them daily. A few years ago we found we could eradicate this grub by the use of bisulphide of carbon, and we made an effort this year to find some other remedy which was perhaps more practical for large affected areas. In the course of our experiments we discovered that the grub could stand immersion in a very strong tobacco solution for several hours

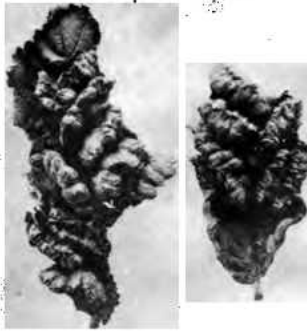


Fig. 1. Cockscomb Gall on White Elm.

without serious results, apparently. Hellebore was used in various ways without success. We have in mind two preventive measures which we shall test next season if opportunity offers.

Bruchophagus (Eurytoma) funebris, was reared in considerable numbers from crimson clover. Varieties of thistles, amongst them the Canada thistle, were noticeably preyed upon by dark colored caterpillars, the larvae of *Vanessa cardui*, that most cosmopolitan of all butterflies, found everywhere, except in South America and the Arctic regions, and many of these were killed thereby. While abundant, these caterpillars were not sufficiently numerous, of

course, to materially affect the thistles, and, it must be confessed, also turned their attention to garden plants, hollyhock, calendula, etc.

Mention has been made above of a troublesome gall-producing mite on the leaves of plum. We have to report, also, in this connection, Cecidomyid gall makers again injuring leaves of Soft Maples, Box Elder, and the cockscomb gall locally abundant on leaves of White Elm. In one county we secured specimens of the peculiar globe-like galls on Red Elms, caused by the gall-making plant louse, known as *Pemphigus ulmi-fusus*. The Plum Curculio has made its presence felt on apples as well as plums, and the New York Weevil, *Ithycerus noveboracensis*, working on fruit trees,



Fig. 2. *Pemphigus ulmi-fusus* on Red Elm.

has been complained of in some counties. A lepidopteran borer, *Podosesia syringæ*, has attacked young ash trees near Adelaide, so weakening their trunks as to cause them to be broken down by the wind. A green saw-fly larva has worked on the leaves of ash trees, and is at present in our breeding cages awaiting its transformations, that we may identify it.

From one to several inquiries regarding injurious insects have been received from each of the following counties: Becker, McLeod, Morrison, Itasca, Yellow Medicine, Kandiyohi, Ramsey, Brown, Rock, Hennepin, Polk, Lac qui Parle, Stearns, Otter Tail, Wright, Scott, Clay, Nobles, Lake, Norman, Rice, Marshall, Dakota, Freeborn, St. Louis, Waseca, Todd, Isanti, Watonwan, Cass, Nicollet, Big Stone, Dodge, Douglass, Renville, Cottonwood, Crow

Wing, Carlton, Wabasha, Fillmore, Redwood, Blue Earth and Lyon.

Four houses in the Twin Cities, to our certain knowledge, and there were doubtless others, have been over-run with the so-called "book louse," *Troctes divinatoria*, which, by the way, is by no means always confined to books. In these particular cases these tiny pests swarmed in bureau drawers and closets, over clothing, on walls and the backs of pictures, and in fact in every place likely to disgust a sensitive house-keeper. An effort was made by this department to free two houses of this unwelcome guest, and partial success was attained by the use of hydrocyanic acid gas, the families vacating the premises in question for about thirty hours. We were unable to locate the starting point or breeding place of the insects in these two cases. It is a significant fact, however, that all of these residences known to be infested are new houses, built within a year, the present occupants being the first to use them. Serious outbreaks of Psocids are unusual, though some are on record, starting from straw or husk fillings of mattresses, in which they find a congenial breeding place. No such chances were offered the insects in the cases above referred to, and we are constrained to believe, from our observations, that they came from the space between the walls, or under the floors, or both. Another family, which, for a year or more, has been troubled by that very common household pest, the little red ant, has appealed to the entomologist for relief, and at date of writing, believe they have been practically conquered by the use of bisulphide of carbon, after they had been traced to their retreat, evidently the walls of the furnace room. Our object in this case, of course, is to kill the queen or queens in the nest or nests thus preventing increase, as well as killing all worker ants in the nest at time of treatment.

In a special report on the Flour Moth, issued in February, 1904, we counselled great care in the use of hydrocyanic acid gas against this pest, and on account of the danger of its application, unless in the hands of experienced parties, it was placed among remedies which were regarded as undesirable for any cause. Personal work with this agent since that date, as well as work done by others in the East, convinces us that it is the most effective and useful of all known remedies when intelligently used. It is absolutely sure death to all eggs, which cannot always be claimed for the freezing

method; it is always available at any time of the year; the gas is most penetrating in its nature, reaching every crack and cranny about the mill; it recommends itself to insurance companies with whom millers hold policies, since it is absolutely non-explosive when used at the strength desired for the Flour Moth, which cannot be said of treatment with bisulphide of carbon. I heartily commend it to our millers as safe and effective when properly used. It should be thoroughly understood, however, that to breathe it is fatal. This very fact makes its use safer, since it is used with great caution by those familiar with it.

Out of the seventy-four listed nurseries in the state, we have inspected, according to law, forty-five, an increase of seven over last year. Their names follow below. The money received for this inspection has been handed to the state treasurer, as evidenced by his receipt:

F. L. Washburn, in Account with State and Nurseries, Debit by Cash Received.

1905.	Name and Town.	No. of Cert.	No. of Receipt.	Cash.
July 5.	Mitchell Nursery Co., Owatonna.....	66		
July 5.	Clinton Falls Nursery Co., Owatonna.....	67		
July 6.	Wedge Nursery Co., Albert Lea.....	68		
July 6.	Albert Lea Nursery Co., Albert Lea.....	69		
July 6.	Gopher State Nursery, Albert Lea.....	70		
July 6.	Minnesota State Nursery, Albert Lea.....	76		
July 8.	Winnebago Nursery Co., Winnebago City....	71		
July 8.	St. John's Nursery, Fairmont.....	99		
July 8.	McKisson's Fairmont Nursery, Fairmont.....	75		
July 9.	Amber Lake Nursery, Fairmont.....	72		
July 10.	Kanaranzi Nursery, Adrian.....	73		
July 11.	Luverne Nursery, Luverne.....	74		
July 13.	Hennepin Co. Nursery, Eden Prairie.....	77	77	5.30
July 15.	Deephaven Nursery, A. O. Hawkins, Excelsior	79	79	1.55
July 15.	Chas. Hawkinson Nursery, Excelsior.....	78	78	1.55
July 24.	North Star Plant Farms, J. W. Beckman, Cokato	83	83	1.40
July 24.	Wright Co. Nursery, John Eklof, Cokato.....	80	80	1.40
July 24.	D. M. Bowers Nursery, Howard Lake.....	81	81	1.40
July 24.	Howard Lake Nursery, W. L. Taylor.....	82	82	1.40
July 24.	Victor Nursery, W. H. Eddy, Howard.....	84	..	1.40
July 25.	Rose Hill Nursery, John Hawkins, Minneapolis	85	..	1.00