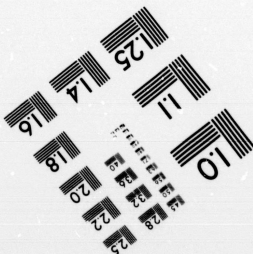
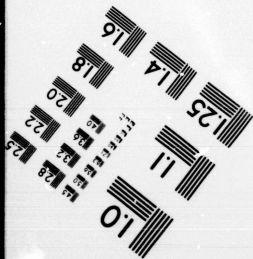
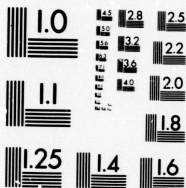


IMAGE EVALUATION
TEST TARGET (MT-3)



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2.1 3.2
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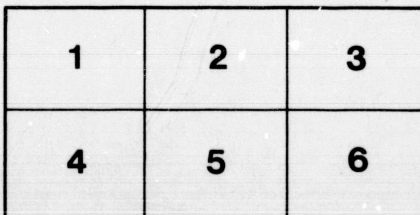
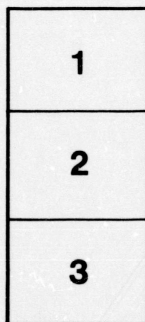
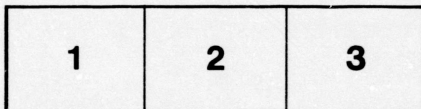
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ONTARIO DEPARTMENT OF AGRICULTURE.

TORONTO, ONT.

MAY 1, 1898.

THE SPRUCE GALL-LOUSE.

(*Chermes abietis*.)

PREPARED FOR THE BUREAU OF FORESTRY BY WM. BRODIE, TORONTO.

In the spring of 1897 many spruce trees in and around Toronto were found to be more or less injured by a pseudo-gall insect. The galls were enlarged and deformed buds of the previous year, usually towards the tips of the twigs. Investigation showed that these galls were formed by a small insect popularly called the spruce gall-louse, the *Chermes abietis* of entomologists. A short account of this destructive pest, as then known in Ontario, appeared in the annual report of the Clerk of Forestry for the Province of Ontario for 1897. Since then it has spread with astonishing rapidity and has been detected at many points, from Peterborough to the county of Bruce, where it was lately detected by Dr. Hunter on native spruce trees in a swamp in the township of Culross. It has also been found on native spruces in Muskoka, near Utterson station. So far it would appear that unless this insect is checked by some artificial means it will soon destroy our ornamental spruce trees and hedges and, extending northwards, do immense injury to our spruce forests.

The trees already attacked by this spruce gall-louse in Ontario are the European spruce, *Picea excelsa*, the double spruce or black spruce, *Picea nigra*, the white spruce, *Picea alba*, and the balsam fir, *Abies balsamea*, and it may also be found on the hemlock, *Tsuga Canadensis*. This insect is native to Northern Europe and was introduced into the United States on imported spruce trees and thence into Ontario, or it may have been introduced here direct from Europe, as for many years there has been an annual importation of young European spruce trees into Ontario.

At Toronto the full grown insects—the producers—emerge from the galls, the scales of which open to give them exit, about August 1st. On emerging they are slightly imperfect, but in one day ample wings are developed which enable them to fly long distances. After distribution the female settles on a spruce leaf and lays—under herself—about thirty-five eggs and then dies, resting on the eggs. In about a week the young six-footed larvæ are hatched. They crawl about and find immature buds into which they burrow and of course remain quiescent during the winter. But in the following spring their presence in the bud causes it to develop into a “gall” instead of a normal twig. The lice in the galls give birth to other living lice so that about thirty individuals are found under each scale of the gall. The galls are usually irregularly spherical and often more than a half inch in diameter. When growing they are of a yellowish green color, but during the winter they assume a reddish brown tint, which they retain until the end of May, when they usually fall from the tree. This is the usual form of this gall but there is another form, not a gall, *in which the injury is done in the leaf axils*. As these insects in the feeding stage are within the gall, and the gall is perfectly water tight, so that no fluid can penetrate, poisoning is out of the question, and as in the migrating larval stage, they do not eat, poison is equally useless. Of course in this larval stage soap emulsions might be of some use, if applied abundantly at the proper time. But without any doubt the cheapest and best plan as yet tried in Ontario is to *clip off the galls as soon as they are noticed—say in June—and always before the first of August*, while the producers are in the galls, and *immediately burn them up*. When a tree is too much infested to be dealt with in this way it should be cut down and burnt at once. Of course there is no use in doing this after the producers are out of the galls. Several cases are known where this plan was carried out with very satisfactory results, and it is respectfully recommended that all those having spruce trees in charge should carefully see to the clearing of their trees and the extermination of this formidable insect pest. As some of our nurseries are affected, buyers of evergreen nursery stock should be very careful to see that the young trees are perfectly free from this insect pest.

DESCRIPTION OF PLATE.

Fig. 1. Gall infested twig as usually seen in the fall season before the death of the part of the twig above the gall.

Fig. 2. Infested twig of European spruce, two-thirds natural size, collected April 16, 1898, from a badly infested tree growing in one of the Toronto public parks, showing the parts of the twigs above the gall dead, the leaves having fallen off, the usual condition found in the spring season.

Fig. 3. Mature, winged fertile form, from a microscope mount, enlarged 25 dia., collected September 1, 1897. In this final stage of development they do not eat, but their ample wings enable them to fly long distances before ovipositing, and hence the alarmingly rapid distribution.

Fig. 4. Immature gall producer, from a microscope mount, enlarged 25 dia., immediately after issuing from under the scales of the gall, August 18, 1897.

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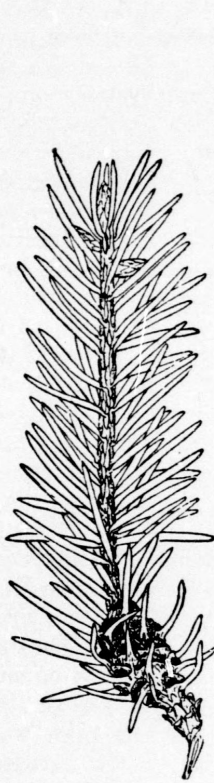


FIG. 1.

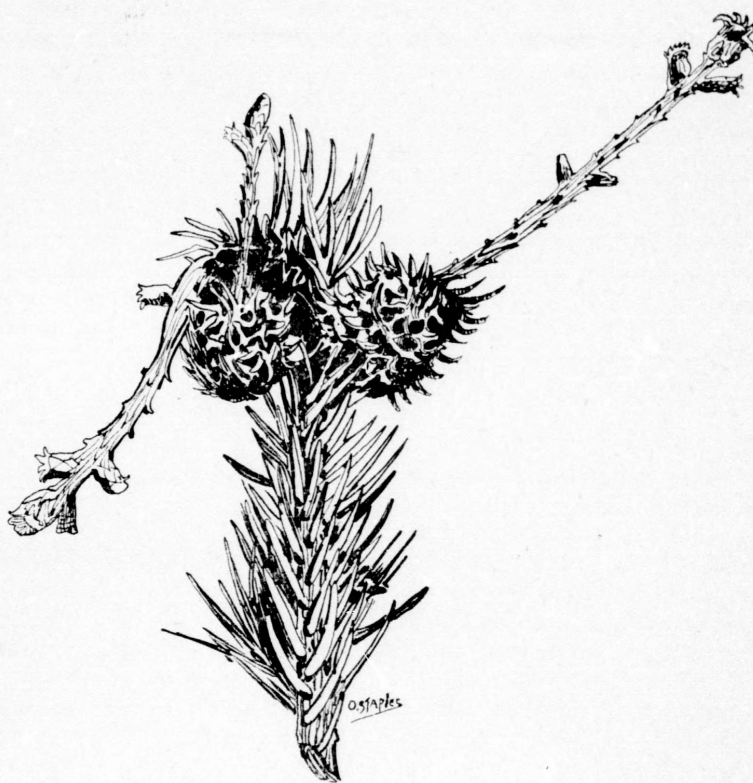


FIG. 2.

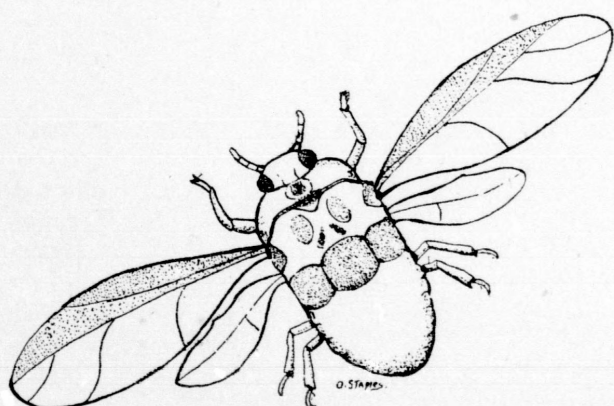


FIG. 3.

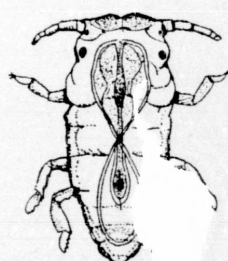


FIG. 4.

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It is also respectfully requested that whoever finds these galls on their trees should communicate the fact and all particulars so far as ascertained, to the

**BUREAU OF FORESTRY,
Parliament Buildings,
Toronto.**

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