

THE JUNIPER WEBWORM. (*Dichomeris marginella* Fabr.)

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An infestation of Juniper webworm on Vancouver Island was first reported near Victoria in 1934. The infested trees consisted of several specimens of Irish Juniper, (*Juniperus communis* var. *hibernica*).

Again, in April, 1935 it was found in the city of Victoria attacking not only the *hibernica* variety but also the spiny juniper, (*Juniperus communis* var. *sibirica*.)

The Juniper family is a very large one and is quite extensively used in British Columbia landscaping. There are a great many species planted in this province and several native forms as well, upon which the webworm might become a serious pest. In view of the fact that this species is not well known to Canadian entomologists, a study of its habits and characters was undertaken, commencing in May, 1935.

Nature of Injury: The larval feeding appears to be confined to the foliage of the *Juniperus communis* varieties. The tiny larvae begin to feed on the upper surface of the small leaves, killing them and thereby weakening the tree. As the larvae develop, they spin a web and form communal nests. These nests made up of dead, brown-colored leaves and twigs enclosed in a tough silken web, contrast sharply with the green of the terminal growth. The nests often contain fifteen or more larvae and occur in sufficient numbers to so mar the appearance of the tree as to spoil its ornamental value.

Life History: There appears to be only one brood each year in the Victoria district. The caterpillars develop slowly and pass the winter as nearly full grown larvae, hibernating in the webbed-together foliage. The majority of the caterpillars reared in the insectary became active early in May and commenced feeding on the more or less dried leaves enclosed in the nest. They became full grown and pupated in numbers from the middle of May to the end of June. Pupation takes place in a whitish silken cocoon, made among partly eaten and webbed-together needles. The first moth emerged about the last week in May after a pupation period of 20 to 25 days. On account of the difference in size of the hibernating larvae the moths appear over a period of several weeks and continue to emerge until the first week in July; the majority, however, emerge about the middle of June.

Egg stage: Usually the eggs are deposited singly, rarely in pairs, and can be found in numbers during the third week in June. They are laid on the new terminal growth, each egg being deposited in the axis

formed by the stem and the leaf. The majority of the eggs were found on the inner base of the developing needles. Some are deposited on the shoots, from which the leaves arise, and on the stems

The eggs, which are generally so well concealed in the axis of the needles that they cannot be distinguished without the aid of a lens, are distinctly barrel-shaped. When first deposited they are cream in color, measuring about 0.5 mm. to 0.6 mm. in length by 0.3 to 0.35 mm. in width. Another distinctive characteristic of the egg is the presence of shallow grooves, irregular in length, extending in a net-like pattern over its entire surface. After a period of about five days, the eggs commence to turn a pink color, gradually changing until finally they are a brick red. The incubation period is approximately 20 days. The oviposition period commences during the third week in June and larvae 0.5 mm. in length were found on July 10.

Larval Stage: After hatching, the larvae feed on the upper epidermis of the small leaves and about the end of July, when the larvae are 2 to 3 mm. in length, the webs are plainly visible. As the larvae mature, their gregarious habit becomes more pronounced and the foliage of the juniper is webbed together more compactly. The webs vary in length from 1 to 5 inches or longer. Such nests contain up to fifteen or more larvae.

The winter is passed in a partly grown condition, half-grown to almost full grown caterpillars hibernating in the silken nests. The larvae become active again early in May and if little or no green food is available they appear to develop readily on the dried foliage.

The mature larvae measure about 10 mm. in length and are reddish brown, striped longitudinally with narrow white lines. The head is a darker brown colour.

Pupal Stage: In the spring, when the overwintering larvae become mature, they commence to pupate. After the middle of May, pupae enclosed in whitish, silken cocoons can be found in numbers within the communal nests. The larvae continue to pupate over a period of several weeks, due to the fact that they vary considerably in size and age. All the overwintering larvae reared in cages kept in the insectary had pupated by the end of June. The pupal period of this species is from 20 to 35 days under insectary conditions. The pupal case is dark brown in colour, measuring about 7 mm. in length and 2 mm. in width at the anterior end.

Adult: The moth is an attractive species measuring 15 mm. across the expanded wings. The head is clothed with a dense covering of stiff white hairs. The palpi are long and heavily covered with long stiff hairs which are white above and brown below. Half way along the upper edge of the palpi a curved spine projects upwards. This spine is about half the length of the palpi. The thorax is covered with a patch

of coarse white hairs, similar to those on the head, with a smaller tuft of brown hairs at each side. The middle portion of the fore wings is brown with coppery reflections and the costal and lower margins are bordered with a conspicuous white stripe extending the full length of the wing. The hind wings are greyish white, heavily fringed, especially on the lower margin. The abdomen is light brown above with a few tufts of long white scales. Below, the body is light brown. The undersides of the hind wings are silvery white.

Control: No control experiments were conducted this season. We advised the owners of affected junipers to spray with lead arsenate at any time from the end of June to the middle of July. This was carried out but we have been unable yet to ascertain whether complete control was obtained. E. I. McDaniel (Mich. Agr. Exp. Sta., Quart. Bul. XVI, No. 4) recommends 3 lbs. of lead arsenate per 100 gals. of water, with 3 to 4 lbs. cheap flour as spreader.

Having regard to the life history of the insect, it is evident that spraying should be carried out before the young caterpillars protect themselves by forming a web. The ideal time for this would be just after the first eggs have hatched, and considerable pressure requires to be used to penetrate any webs which may have been formed. By applying the spray at an early date, the foliage will be coated with arsenate which should give protection over the remainder of the hatching period. If the spray is applied too late, great pressure is needed to penetrate the webbed-in feeding areas. In the fall, any nests that have been formed should be pruned out and destroyed.