

In hops or other plants much infested by Aphides for any considerable length of time, a shining, glutinous substance, forming a kind of varnish, may be observed on the leaves, particularly the upper surface. This substance, popularly termed "honey dew," is secreted and exuded by the insects; it is of a sweetish taste, and most effectually chokes the pores of the leaves; so that with the sucking of the juices and the injury done to their functions, this pest alone, unless speedily arrested by natural or artificial means, will surely effect the destruction of the plants.

Fortunately, nature, or rather the wise and beneficent Author of nature, has so instituted counterbalancing forces in His works, as to maintain the conservation of the whole. As regards the honey dew, so injurious to the healthy functions of the plant, bees may be seen in thousands sweeping it from the leaves on which it has fallen, while ants innumerable lend their valuable aid to the cleansing process. The aphides are far more numerous in some seasons than in others; the force and direction of the wind have considerable influence as regards their distribution, and even probably their numbers. But the once prevalent notion that destructive insects, commonly called "blight," were *originated* by any particular condition of the atmosphere, such as an east wind, is clearly shown by the researches of the modern entomologist to be a popular error. Fortunately, not one-tenth, probably, of the larvæ reach the winged state; and many little ichneumons lay their eggs in the aphids, causing it to swell and die, when shortly arises out of its decomposing body a hidden parasite, which has there marvellously undergone its necessary transformations. But the most destructive, and fortunately the most common enemy of the aphid, is the beetle popularly known as the *Lady-bird* (*Coccinella*), a great variety of which are to be found in all parts of the world, and are the best and truest friends of the farmer and gardener. The popular name by which they have been known in Europe from time immemorial, denotes the sacred esteem in which they were held for their important services. They were regarded as being under the special protection of the Virgin Mary, hence they were called birds, or cows of our Lady, and even children still regard them with affectionate reverence. The largest species of these beetles we have in Canada is the *Coccinella borealis*, often to be seen on the vines of melons, pumpkins, and other kinds of gourd; not eating the leaves, as is often supposed, but the innumerable plant lice which are so destructive to this kind of vegetation. On hops, rose bushes, peas, &c., are to be found other and smaller species, varying in size and colour; but all rendering most valuable services.

The hop-vine *Hepiulus* (*Hepiulus Humuli*) sometimes does considerable harm to the young roots of the hop, and the larvæ of other species, caterpillars or worms, attack the leaves of the vine so as to riddle them completely, and thus most seriously affect the development of the plant, and the size and quality of the fruit. These worms have been known occasionally to attack the hop in America for many years, but it is only comparatively recently that any serious consequences have arisen from the attacks of Aphides, which have almost destroyed the crops twice, both in Canada and the State of New York, within the last half dozen years. We never saw the "fly" blight more virulent in England than what has been experienced here—the vines completely stunted and blackened, with such an accumulation of honey dew, lice and filth on the leaves, that after a heavy rain the surface of the ground around the hills has been colored as with ink. There is reason to fear that in the case of hops, as in fruit, the injuries arising from insects will increase.

It is, then, an important and very natural question to ask—what can be done to prevent or mitigate these evils? In England, till within a recent period, the hop-grower was entirely passive under the attacks of aphides. True, he occasionally burnt heaps of weeds

in different places of his plantation in calm weather, dusted the poles with quicklime, soot, and other like things, which at the best had only a very partial effect. The cleansing of the leaves of the lice and flies at the earliest period practicable, by means of a small hand brush, was occasionally tried, and not always with satisfactory results, as new broods of insects would sometimes follow. Besides, this operation could not be generally carried out even in England, and would be wholly inapplicable here. Within, however, the last few years great progress has been made by the English hop-growers in this direction. An apparatus has been invented by which the flowers of sulphur can be readily and uniformly dusted over the plant as it grows on the pole; likewise, a syringe which will spread over the plant a solution of tobacco and other substances, each or both of which combined has been known to save the crop. In some cases the operation has to be repeated, involving an expense of twenty or thirty dollars and upwards per acre; a sum too insignificant for consideration in cases where the operation is successful. The fumes of tobacco and soap suds have been often tried with more or less success. We would certainly recommend our hop-growers to experiment with these remedies when occasion requires. The saving, or even the half saving of the crops, would justify any reasonable amount of expense and trouble required, as hops in blighting years always command high prices. It is worthy of remark that high cultivation of hops is often no preventive of the aphid blight; sometimes the richest and best managed grounds will actually fare the worst. That is, under such conditions, the plant is enabled to maintain a much longer struggle with fresh generations of insects, till its energies at length give way, and the season being far advanced, it has no chance to rally, and the failure will be complete. Therefore, any additional cultivation or manuring during the attacks of aphides is not to be recommended; it would probably only increase the evil, by enabling the plants to prolong the struggle without finally conquering. We have frequently seen an early attack of aphides on hops not naturally very vigorous, producing only a temporary effect; these insects soon die from the want of food, a favourable change of weather takes place, and a tolerable yield of fruit, after all, is realised. After the insects have departed, too much attention, by way of culture and applying manures which will readily become soluble, to invigorate the plant, cannot be given.

Hops are also liable on certain soils, particularly in warm, moist weather, to the attacks of fungi, commonly termed "mould," or "mildew," which though seldom so widely injurious as the aphid blight, is often exceedingly destructive within limited areas, and in particular kinds of hops. For instance, the *Golding* is more subject to it than the *Grape*; and rich calcareous soils than the inferior clays. Small white spots first appear on the leaves, gradually enlarging, till the juices and tissues of the plant become so diseased as entirely to prevent the maturing of the fruit. The remedies before mentioned relative to aphides have of late been applied to the mildew or mould, with partial success; but the disease is exceedingly obstinate, and in these, as in other maladies, both of plants and animals, no reliable panacea has yet been discovered.

A little beetle called the flea, very similar to that which commonly attacks the leaves of young turnips, is frequently injurious to hops, particularly before the bines are long enough to reach the poles; and in this way the young shoots are often seriously injured, and the plant weakened and kept back. Quicklime has but little effect upon these case-hardened depredators. The frequent cultivating of the ground and hoeing closely round the hills will always disturb them more or less, and assist the growth of the plant to get out of their reach. In England attempts have been made to catch the fleas in a glass bottle by means of an inverted funnel, seldom, we believe, with much success. The *wire worm* is sometimes exceedingly injurious to hops,—particularly during the first and second years. It eats the young roots beneath the ground, seldom, if ever, attacking the growing shoots. We have known this enemy destroyed by capturing it alive in this manner: put pieces of fresh cut potatoes around the hill, slightly covered with earth; the wire worm will be attracted from the hop roots to the potato cuttings, which after a day or two are to be taken up and the worms destroyed. A single piece of potato will often contain a dozen worms in land badly affected.

And now, a word of two of caution to our readers. We advise none of our farmers to commence hop-growing unless they have a suitable soil and climate, and make themselves particularly acquainted with the most approved systems of cultivation, drying, and preparing the crop for market. This knowledge can only be acquired by personal observation, and taking a part in the different working processes. Hops, un-

less of good, sound quality, carefully picked and dried, cannot be exported to England profitably. The present high prices, both here and there, the prudent man will regard as *exceptional*, and our hop-growers must make up their minds, probably not at a distant date, to take again ten or fifteen cents a pound. In case of a large American growth, we must necessarily look to England for our principal market. An objection is commonly made by English brewers against American hops, on account of their rank and unpleasant flavour, resembling the taste and smell of black currant leaves; a circumstance no doubt arising in some measure from soil and climate; but more probably from the coarse kinds too commonly raised, and some defects in the mode of cultivation and curing, matters which are within the planter's control; and to the improvement of these various details we must mainly look for making the business of hop-growing more remunerative.

We cannot better close this series of papers than in the words of the late Professor Johnston:—"It is interesting to observe how men carry with them their early tastes to whatever new climate or region they go. The love of beer and hops has been planted by Englishmen in America. It has accompanied them to their new empires in Australia, New Zealand, and the Cape. In the hot East their home taste remains unquenched, and the pale ale of England follows them to remotest India. Who can tell to what extent the use of the hop may become naturalized, through their means, in these far off regions? Inoculated with its milder influence, may not the devotees of opium, and the intoxicating hemp, be induced hereafter to abandon their hereditary drugs, and to substitute the foreign hop in their place? From such a change in one article of general consumption, how great a change in the character and habits of the people might we not anticipate?"

Alsike Clover.

The following account of this valuable variety of clover we take from the *North British Agriculturist*, and is translated from the "Hand-Book of Swedish Agriculture," by J. Anhenius, Secretary of the Royal Academy of Agriculture. As a pretty full description of the peculiarities and culture of a crop that is attracting considerable attention, the extract will no doubt be interesting to Canadian farmers, whom we earnestly recommend to try this variety of clover. We are convinced by actual experiment that it will do well in this climate. A small field of our own, seeded down last year, is the most luxuriant bit of clover we have seen this present season, and the perennial character of this variety of clover renders it most valuable, if only it is found to do as well as the common clover.

"Alsike Clover (*Trifolium hybridum*) is a pale red perennial species of clover, which, mixed with grass, is cultivated with great advantage on permanent grass land, whether employed for pasture or mowing. This species of clover thrives best on marly clay with a somewhat moist bottom.

Alsike clover has obtained its name from the parish of Alsike, in Upland, where it was first discovered, and where it grows in the greatest abundance in every field ditch.

This species of clover has pale red flowers, a somewhat lank stalk, and oval obtuse leaves, which are less, and of a lighter green than those of red clover. The flower-head, growing from the upper leaf joint, is globular, and formed of fragrant blossoms supported by stems. These blossoms are at first whitish and upright, and subsequently of a pale red, which, when the flowering has passed, becomes brown and somewhat bent. The calyx is smooth, and its tags of equal length. The seed pods, containing three or four grains of seed, extend out of the calyx, surrounded by the withered crown. The seed is much less than that of red clover, is in the form of a kidney, and dark green, or verging somewhat towards violet. Yellow green seed of this plant is not ripe.

Alsike clover does not attain its full luxuriance until the second or third year after it has been sown, and during the first year seldom arrives at any great degree of growth. It is therefore best adapted to mixture with grass, for permanent grass land. It yields, on suitable and fruitful soil, rich and good fodder. It loves clayey soil, especially marly clay, with a somewhat moist position; but it also thrives on cultivated fens and marshes. Alsike clover grows but little after mowing, and no second crop can be expected from it, as is the case with red clover. Both in this respect, as well as in the longer time it requires before it yields a full crop, Alsike clover, stands after red clover. Its great and undeniable