

SUGAR BEETS

PROBLEMS OF BEET CULTURE By Jesse H. Buffum.

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Rust is not a serious disease, but has made its appearance, and may demand vigorous attention in the near future. It seems to appear mostly on beets that have remained a long time unused. It is not so destructive as many of the other enemies of the root.

Last year France was called upon to grapple with a new sugar beet disease, which appeared in the form of a parasite. The whole of the beet was attacked, all the stems of the leaves were hollowed out with deep channels open to the air. Rot sets in in consequence in some portions of the root. On tearing the beet apart, tiny caterpillars in various stages of development were found, in groups of from ten to twenty, resembling those that prey upon the apple trees, but very much smaller. It is supposed that in a dry year from eight to ten generations of these caterpillars develop in one growing season of the beet, which explains the intensity of the scourge. From the attacks of these parasites a deadly rot immediately sets in, making absolutely impossible any extent of storing or siloing, as the beets will not keep, but continue to rot rapidly. The caterpillar comes from the larva of a small butterfly. The remedy suggested for this affliction is two-fold, first, to destroy, preferably by burning, all dead leaves and collars or crowns of the beets on harvesting; and, second, to increase all cultivation, hoeing and removal of weeds, keeping the entire field and vicinity absolutely free from weeds and all growth or other conditions favorable to the seclusion of the parasite.

This is truly one of the most interesting of all pests known to the sugar beet. Although the first year's experience with it in France brought great disaster to the localities infested, yet the scientific researches resulting give us a wonderful insight into the habits of the caterpillar and likewise reassure all growers through the discovery of a natural enemy of this parasite, which pursues it with relentless diligence. This is the com-

mon female bee, which carries in her abdomen a sting, which, when inserted into the body of the caterpillar, ejects a microscopic egg. The caterpillar apparently is not at the time disturbed, but matures, leaves the beet, secretes itself in the ground and produces a cocoon, which is to become a butterfly. But the cocoon is no sooner spun than the egg that the bee has inserted in the body of the caterpillar hatches, and the larva that develops devours the organs of the chrysalis. Then it transforms itself into a grub, and at the breaking of the cocoon there comes forth an "ichneumon" instead of a moth. By reason of this natural enemy existing to constantly war on the destructive caterpillar, beet growers may take courage in the belief that the pest will at least not become increasingly destructive, and undoubtedly will diminish gradually; last year proved to have been an exceptionally destructive one in this respect, due perhaps to the excessive dryness.

Heart-rot is one of the common diseases of the sugar beet, and its study by scientists and studious growers has been prolonged, resulting in considerable light on the subject being given to the everyday grower. Unquestionably soil conditions determine the development of this disease. It occurs most commonly in soils of an argillaceous nature, or clay soils, which are not porous and do not permit of deep aeration and storing of moisture. On newly cleared land, in spite of all precautions, heart-rot will frequently appear, proving again conclusively that the sugar beet does not take kindly to native soil. In closely packed earth, in fact in all soils that have little humus, beet roots will suffocate.

Heart-rot does not usually appear at the very outset of the beet growth, but when the dry season sets in, say, in August. Remedies are not plentiful, yet all authorities that the writer has been able to consult agree that deep fall plowing, to admit of the storing of water, is one of the very best precautions, especially where stable manure is to be turned under. Again, where it is possible and feasible, the application of wood ashes will be found beneficial and destruc-

tive to the fungi causing heart-rot.

Curly Top, or Beet Blight, stands as not only the most common foe to beet culture, but the most disastrous throughout the fields of the western part of this country. Its comprehensive treatment under the head of enemies of the sugar beet is impossible in the limited space remaining at my disposal, so the subject will be taken up more at length at some future time. It is of interest in referring to this pestilence, however, to note that with some students there is supposed to exist a relationship between curly top and electrical storms, and this forms the basis of one of several theories now under investigation. The supposition is given some credence in the Department of Agriculture, which, however, has not yet gone on record as having confidence in this as a direct cause of the blight. In France it is held by not a few scientists that the web-worm is responsible for the trouble, though again the theory is not substantiated. As many as twenty theories have been advanced and investigated in this country as to the cause of curly top, and the strongest effort possible is being made to bring the blight under control. As yet the real cause is unknown.

In the whole matter of beet culture, and especially as respecting the pests and diseases that beset the root, great watchfulness and close study bring their own reward in both precautionary and curative returns.

• • • —SILOING.

All through the beet growing season, which has now come to a close, we have been discussing each operation of culture as if great improvement could be made in that particular phase of the work, and have endeavored to show that something of a revolution in this industry might be effected if only the beet growers themselves were able to awake to the possibilities and opportunities ahead of them. This stand can be taken, it may be explained, on the ground that in reality this industry is new, and growers, even in established districts, have not become as conversant with the superlative of their work as might justly be expected. Hardly can this attitude on the part of the student be criticised, for he is fully justified in

calling attention to obvious deficiencies in the beet growing business. It is only when these deficiencies are recognized and corrected that material progress is going to be made. When it comes to improvement in methods and practice, the producers themselves should be the thinkers, exerting themselves along lines of definite progress; but they are not as a class, and if any one criticism more than another must be made of them it is that they are too well satisfied with partial success and are prone to ignore the greater results awaiting study and experimentation. This refers to the matter of siloing as well as other things, as we shall endeavor to point out in this discussion.

In up-to-date beet culture, siloing has become a fact. There is no getting around it; and while some are far sighted enough to foresee that this element of present day perplexity must some day be converted into a great possibility both for the factory and for the farmer, it is worth while for present profit to discuss ways and methods, for there is a good deal of variety discoverable in the practices of those who are forced to silo their beets.

Under the present systems siloing is a hardship. We are not advanced in experience to understand how best this work may be done, and therefore loss occurs in almost every instance. The fact of siloing, however, must be faced, and although less than 50 per cent of the general crop is treated in this way, yet for that amount even a slight saving per ton will bring ample reward. The present day difficulties encountered in siloing beets may be summarized as follows:

Loss of weight through evaporation.

Increased tare through dry adhesion of dirt.

Extra handling (probably tripled).

Cost of covering; disagreeable to uncover and load.

Delay in sale of beets and receipt of pay.

Occupying valuable field space and consequent delay of fall plowing.

Destruction of feeding value of tops, which probably are utilized as covering and therefore spoiled, though still good as a fertilizer.

Expensive retention of labor that otherwise would have been utilized and dismissed.

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