

IRRIGATION OF SUGAR BEETS

A bulletin of the United States Department of Agriculture, prepared by the official in charge of irrigated experiments, is a practical manual, giving methods pursued throughout the irrigated beet-growing sections. Furnishing as it does information to new settlers in irrigated districts, as well as suggestions to beet growers as to the practices in districts other than their own, should be of value in introducing the growing of beets and improving the methods of handling this crop. As the matter now stands, each community where this industry has found favor is proceeding along lines suggested by local conditions, which are more or less peculiar, and this bulletin is designed to be a compilation of the practices throughout the West, to which are added the results of experiments conducted by the department of agriculture in irrigation of sugar beets during the past four years.

The results of these experiments all point to the advantage of the control of the flow to furrows by lath boxes or pipes. The slowness with which the water moves permits of its deep penetration into the soil, prevents waste at the lower end of the field, and the use of the boxes saves considerable labor after they are once installed. Yields are better also, due to confining the water to the furrows and not permitting it to wet the top soil next to the beets. The thorough saturation which it gives is far better and less costly than a number of lighter irrigations, which are given in some of the localities. The number of irrigations needed depends largely on the season and whether the beets are paid for on a flat-rate basis or according to the sugar content. If on the flat rate, more water is required, but it must be remembered that keeping the soil continually wet will reduce the tonnage instead of increasing it, as the results at Loveland during 1906 clearly show, while there is the danger of ruining the land by raising the water table and producing a swamp. The beets under such conditions will be slow to ripen, and there is the liability of their refusal by the factory, due to too large size and low sugar percentage.

If a contract calls for percentage payments it will require a more thorough and careful understanding and study of conditions, so that both good tonnage and high sugar content may be secured. As has been shown, the beets must ripen at the time of harvest so as to contain their greatest values in sugar, and the application of water must be such as to cause a continuous healthy growth throughout the season, so that the tonnage is not sacrificed. A contract of this kind is equally beneficial to the factory and the grower who exercises care and judgment in the handling of the crop, which results in better returns on the average than the flat rate contract. For example, a 17-ton crop at \$4.50 per ton on a flat rate would bring \$76.50, while if the same crop contained 17 per cent. of sugar it would bring, on the percentage rate, \$4.50 for 15 per cent., and an increase of 25 cents for each 1 per cent. over \$5 a ton, or \$85, which is equal to 11 per cent. more than the flat rate.

DODDER ON CLOVERS

Occasionally dodder is procured in clover or alfalfa seed. This parasitic weed causes considerable loss and special care should be taken to avoid introducing it in imported seeds. Discussing this weed in relation to farm crops, G. M. Frier, assistant in agricultural extension work at Purdue University Agricultural Experiment Station, says: "So injurious is dodder to clovers and alfalfa that the presence of dodder in these crops or in the seed of them, even in small quantities, should be a matter of much concern. Of the red clover seed examined to date in the seed laboratory of this station, 5.6 per cent. of the samples contained dodder; of the alfalfa, 61.5 per cent. contained dodder. It is not unusual to find dodder in American-grown white clover or alsike clover. None was found in the samples analyzed here. As might be expected from the results of analyses made, dodder is positively known to exist as a pest in a number of Indiana clover and alfalfa fields. The character of dodder seed is such, that where the pest exists in the fields and is allowed to mature, the seed of it is sure to be in the clover seed crop, if the clover should be so fortunate as to survive the effects of the dodder living upon it. The existence of dodder in clover and alfalfa seed and of the dodder plants in the fields will prove, if unchecked, a gradually increasing menace to clover and alfalfa growing in the state. Dodder seed matures about the same time as clover seed. Much of it reaches the ground. The seed germinates, at first getting nourishment from a supply stored up in the seed. A slender, delicate shoot appears. This little stem sways about looking for a support, or a host, as it is often called, for its habit is to twine and climb about other plants, especially clover or alfalfa. When it reaches a clover or alfalfa plant it sends out little suckers which enter the host wherever the dodder touches stem or branches, and extracts therefrom ready-made food materials. Here is where the damage from dodder comes in. The dodder once attached to a suitable host, branches extensively, thus sending suckers in large numbers into the juice-conveying tissues of the clover or alfalfa. As soon as the food stored in the seed is exhausted, the dodder plant becomes a complete parasite, living wholly on the host plant. It dies at the ground, thus cutting off all connection with the latter. The trouble begins in circular "spots" which gradually spread out. Examine a "spot" and there will be seen in, around, and among the clover or alfalfa, a much branched, tangled mass of lemon yellow, orange, or pink threads attached to the clover at many points by suckers, much as ivy is attached to a wall, only the suckers of dodder not only cling, but extract the juices, and hence the vitality from the clover or alfalfa. Dodder is wholly destitute of leaves and is incapable of manufacturing food for itself. Hence it is a plant parasite. The flowers are usually many, and crowded in dense bunches. As a rule, dodder is a heavy seed producer. As the season advances these "spot" centers and the clovers and alfalfa do little by little.

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