NOTES

FERTILIZER DISTRIBUTOR FOR FACTORIAL DESIGN EXPERIMENTS

Conducting potato fertilizer experiments with the equipment ordinarily used involves considerable labor. It is necessary to empty the fertilizer hopper with every change in fertilizer. This work can be reduced by making all the plantings with a given fertilizer before changing to another, but this requires much extra travel about the field, especially when extensive experiments are involved which necessitate the use of extra land for getting from one plot to another or driving the machine over land already planted.

The introduction of factorial design has tended to increase the number of fertilizer treatments included in such an experiment with a consequent increase in the number of fertilizer changes that must be made. To overcome these difficulties and simplify the installation of such experiments, a fertilizer distributor was designed which does away with the necessity of emptying the hopper and which makes possible the continuous planting of an experiment regardless of the number of fertilizer treatments involved.

The apparatus herein described was used at the Long Island Vegetable Research Farm at Riverhead, New York, to install several potato fertilizer experiments, one of which included 27 different fertilizer mixtures. It was also used on four other farms in 1940 to install less complicated potato fertilizer experiments and this use greatly simplified the work as compared with previous methods.

The fertilizer hopper of a single-row potato planter was divided into three compartments each of which was fitted with a gate which could be regulated to deliver given quantities of fertilizer materials. One of these compartments carries a mixture of nitrogenous materials; the second carries superphosphate; and the third carries the potash supply. As the delivery from each compartment can be regulated independently, it is possible to obtain any desired mixture within the capacity of the machine. A single belt revolving beneath the hopper serves all three compartments; so it was necessary to provide slides that could be inserted to cut off the flow when it was desired to omit one of the elements.

The machine was originally provided with a single gate approximately 7 X 7 inches which regulated the delivery of fertilizer by its distance above the belt. This single gate was replaced by three gates each 2 X 7. (See Fig. 1 for details of construction.) A hole was bored in the center of each gate and this was tapped to take a ½-inch iron bolt which was screwed firmly into the gate and fastened with a locknut. These bolts are approximately 2½ inches long and extend through slots in the front wall of the hopper to provide attachment for the control levers. Care was taken to eliminate looseness in the movement of the gates and in the levers that control them. The two partitions extend below the hopper to the surface of the belt to pre-

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