

End Dump Arrangements on Old and New Receiving Equipment

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Approximately 50 percent of American Crystal Sugar Company's, present beet receiving equipment in the Red River Valley will handle the unloading of end dump trucks. We have eight different types of loaders with end, or combination end and side dumping facilities. These eight types include the 30-inch Ogden Piler, the 30-inch Lynch Loader, the 30-inch Silver Roberts Loader, the 30-inch Silver Loader, the 36-inch Silver Engineering Works Loader, the 36-inch Silver Engineering Piler, the 36-inch Silver Engineering end dump Loader, and the 38-inch Ogden Loader.

In 1947 we converted our first side beet loader to a combination end and side loader and, in 1949, one more was converted. One end and one combination end and side loader were purchased in 1951 and one end and one combination end and side loader were purchased in 1952. In 1953, three end dump loaders and one end dump piler were purchased and five more conversions were made.

We find that this changeover in the type of our receiving equipment has been beneficial to both our growers and ourselves. A high percentage of farmers in this area has been purchasing hydraulic end dump equipment and new grain boxes for their trucks; and these changes have made it possible for them to use the same box for beets which they use for grain. Machine harvesting has speeded up deliveries of beets, and the timesaving factor of unloading has been valuable to them also. These changes to end dumping have made it possible for us to reduce our station crews, have increased the efficiency of our loaders and have greatly reduced the amount of work for the main station operator. Loaders which have been converted to straight end dumping have made it possible for us to remove troublesome mechanisms and, consequently, have reduced maintenance on these loaders.

Possibly the most important factor of this end arrangement of dumping is its ability to handle muddy beets faster and more efficiently than with the old fashioned side dumping. The flow of beets from truck box to hopper can be controlled much better hydraulically than with a friction-type cable hoist and, in handling muddy beets, this ability almost eliminates the cause of beets lodging *in* the hopper. Muddy beets pass out of this new, completely open pit a great deal easier than through the funnel-type side hopper.

In converting a 30-inch Ogden Piler for straight end dumping, it was necessary to remove the "A" frame used for hoisting loads, and also the wooden platform. After this portion of the loader was eliminated, a cement retaining wall was built parallel and adjacent to the long open hopper. After placing a broad dirt fill against the cement-retaining wall and laying a cement slab on top of the dirt fill, beet loads could be unloaded by the

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truck operator driving over the fill, making a right angle turn, and then backing truck at right angles to the long open hopper.

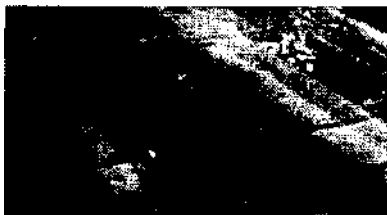
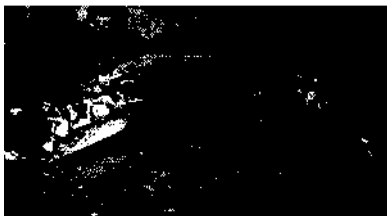
One of our 30-inch Lynch Loaders was changed to combination end and side dumping by placing a retaining wall and dirt fill directly behind the side dumping pit. This arrangement allowed trucks to unload from an end position of the belt as well as by the conventional side method.

Another 30-inch Lynch was converted to straight end dumping after removing platform, hoist clutch, "A" frame, and side hopper. After this portion was removed, a square concrete pit and hopper were built around the ground end of main conveyor. This square concrete pit had to be built a little higher than the usual concrete Lynch dirt pit, as the top portion of this new concrete pit was used to support the sides of the newly fabricated sheet iron open beet pit. A dirt fill was placed in front of the cement pit and hopper to enable trucks to back up to the loader and unload from an end position of the belt. This loader proved to be very successful and growers were well pleased with the change.

Two 30-inch Lynch Loaders, two 30-inch Silver Roberts Loaders, a 30-inch and 36-inch Silver Engineering Works Loader were converted to combination side and end dumps. This was accomplished by removing a six-foot section of platform directly over the belt on each machine, and installing two runways for truck wheels to pass across the removed section (Figure 1). The overhead wooden "A" frame was also removed from the Lynch Loaders and a single steel side "A" frame was installed for lifting loads that had to be side dumped. The runway cleaning device was constructed by hinging safety tread steel plates to runways. These cleaning plates are manually operated on two of our conversions and hydraulically operated on the other conversion (Figure 2). We fabricated a sheet iron pit directly under the platform opening and installed one additional roller under the belt to support extra weight of beets on the belt. These conversions worked out very nicely and speeded the handling of beets at these six points.

In the Red River Valley, we have made purchases of two 38-inch Ogen Combination end and side loaders, and two 38-inch Ogen all end dump loaders; however, plans are to convert the two combinations to straight end dumping for 1954. This will be done by removing the platform, the "A" frame, and hoisting mechanism. After this portion is removed, we plan to install a concrete dirt-retaining wall along the hopper and make a dirt fill and lay a concrete slab on top of the fill. This will allow trucks to back in at right angles with the long open hopper. Under the old arrangement, it was necessary to back a truck through a steel "A" frame and it was sometimes difficult to maneuver trucks into the unloading position. The removal of these obstacles will also eliminate the danger of an operator being pinned between the truck and steel "A" frame. It will also reduce maintenance and, in general, will be a much less confusing way of receiving beets.

Two years ago, it was necessary for us to make plans to purchase additional stationary loaders. Our experience with end dumping on changed-over loaders convinced us to encourage some manufacturer to design and

**Figure 1****Figure 2**

construct an all end dump loader without the usual side dumping mechanisms. He contacted several manufacturers and asked them to design such a loader. We encouraged them to embody some of the proven end dumping principles of our previous conversions and we also made further suggestions regarding its design. They agreed to design and blue print such a machine and, after the blue prints were presented to us for consideration, we were satisfied to the point of purchasing three of these machines. They are right angle loaders, with 6-foot rubber reinks cleaning screens and 36-inch conveyor belts. These loaders are designed to enable beet loads to drive directly over the end of the conveyor belt, by passing over two wheel ramps constructed at right angles across the belt (Figure 3). The wheel ramps mechanically clean themselves by being driven or raised with a separate electric motor after each load has finished unloading and removed itself from the ramps (Figure 4). A good feature with this type of unloading is that it eliminates the necessity of backing a truck load of beets, which is sometimes difficult and dangerous to do. This time saving and less confusing way of unloading beets is unique and serves the purpose at stations that require the handling of 1,500 to 1,600 tons per day. These loaders, and particularly this principle of receiving beets, worked out exceptionally well and we have only minor changes that we would recommend to the manufacturer to make on future models of this loader.

This year our company purchased a 36-inch Silver Piler, plus a separate Silver end dump ramp mechanism which operates adjacent to, but separately from, the piler. This turtle-appearing unit has the ability of accepting an end-dumped load of beets and delivering it to the piler hopper. Trucks

**Figure 3****Figure 4**

pass up and over this affair and stop just as the end of the truck box passes center position of the ramp unit. Hydraulic mechanism pulls a floor section of the ramp back, and in an up position, to form one side of an open hopper. Hydraulic power also raises a smaller section of the ramp floor on the truck side of the hopper to form the second side of the hopper. Outside of controlling the movement of the unit and supplying power for the main beet conveyor, practically all other mechanisms are hydraulically controlled on this end dump ramp unit. This is the first end dump unit of this type that Silver Engineer has built. It worked remarkably well for the first year and we have only a few minor suggested changes to recommend to the manufacturer on future models.