

The Molnau Sugar Beet Cleaning Screen

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The screening unit under discussion was designed and built by Erwin P. Molnau, beet dump maintenance foreman for the Chaska, Minnesota, factory of the American Crystal Sugar Company. It was his belief that the extremely simple cleaner which he had in mind could be built at a reasonable cost, that it would be highly efficient and that it could be engineered easily to replace our many types of screening equipment, none of which was giving a satisfactory job of cleaning.

Two units were installed for the 1949 receiving season, one on a 30" silver Ogden piler, which incidentally was rebuilt into a straight line loader, resulting in the elimination of the boom, and the other on a 1936 Silver-Roberts Iron Works standard beet dump. One hundred sixty-five cars were loaded over the former and 158 cars over the latter during the receiving season. Rains of sufficient duration to stop all mechanical harvesting and lifting operations for three days occurred twice during the harvest period. On both occasions loads were received during the rain as long as growers cared to continue hauling and the screen functioned well, with no wrapping of trash or plugging with mud resulting.

Construction

The screening device consists of two sets of four substantially parallel 6" rollers six feet long. Each roller is formed from a plurality of 5/8" steel rod members and having means for rotating the rollers of the two sets in opposite directions (starting at the center of the screen) to split the How of beets as they travel down the screen. The beets are carried laterally outwardly, while at the same time they move longitudinally down over the screen to the car. The rollers are six inches in diameter and are spaced one inch apart. The main drive is a sprocket and chain drive through a spring-loaded slip clutch. The 8 roller shafts are of 1 and 7/16" cold rolled and the head drive shaft is 1 and 11/16" with a pillow block supporting the center of the shaft. The rollers are driven by 5" steel mitre gears running in oil in a sealed housing. Bearings are mechani-seal flange cartridge type. The cleaner requires no greasing for a complete receiving season. The two outer rolls are elevated four inches to aid the longitudinal movement of the beets and are driven from the adjoining roller by diamond chain and sprocket. The outer side frame is 7" channel, the end sections are 5/16" flat iron and the drive cover is 1/8". Overall dimensions of the 8 roll screen as fabricated this year are 7'x4'10". The screen is most efficient at 150 RPM.

Summary

The screen is of simple construction. It is not a particularly costly installation. It is more efficient from the standpoint of both dirt and trash elimination than any screen we have observed. It does not break off beet tails. It does not clog or wrap. It performs satisfactorily in the mud. The screen will be manufactured by a commercial firm engaged in construction of beet receiving equipment.

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