

## Summary of the Development of the South Dakota State University Pasture Interseeding Machine

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Improving pasture production through interseeding grass or legume species with minimal disturbance of existing vegetation has long been a goal of South Dakota State University Agricultural Experiment Station researchers.

South Dakota State University agricultural engineers and agronomists at Brookings and Norbeck, South Dakota, developed and tested several early experimental pasture interseeder models between 1965 and 1968. Between 1969 and 1971, researchers developed and modified the 1969 model of the SDSU pasture interseeder. This interseeder cut four furrows spaced 24 inches apart. The interseeder used a pair of discs to cut each furrow approximately 6 inches wide and 3 inches deep. This machine was used in all of the interseeding research conducted in South Dakota from 1969 through 1979. The machine was quite complex, the components were difficult to obtain, fertilizer could be applied only at one constant rate, and the machine had excessive breakdown time (Vigil 1980).

A new and improved pasture interseeder was developed in 1979. The 1979 model of the SDSU pasture interseeder was a relatively simple fabricated toolbar for four chisel plow shanks (figure 1). Plans for the improved machine (Chisholm et al. circa 1980) provided instructions for its construction. The main frame was made of two 10.6-foot lengths of 4 X 4 inch steel tubing placed fourteen inches apart. The front toolbar held the three-point hitch assembly and the parking stand. The back toolbar held the four chisel plow shanks and the two gauge wheels. A 5 X 3 inch steel tube was mounted three feet above the back toolbar to hold four hydraulically driven jumbo hopper boxes with two spouts each. The boxes could be adjusted independently to regulate the flow of seed or fertilizer. Plastic hose connected the spouts of the boxes to the solid seed pipe mounted behind each plow shank. A regular drag chain was attached at the bottom and to the rear of the seed tube, just above the level of the seedbed (Chisholm et al. circa 1980).

The chisel plow shovels used on the SDSU pasture interseeder were 4 inches and 6 inches wide, and each had a right-hand or a left-hand twist. The shovels were mounted on the shanks so that the twist of the chisels would throw the soil from the furrows away from the center of the machine (figure 2). The furrows from the 4-inch shovels were usually 5 to 6.5 inches wide and 3 to 5 inches deep. The wider, 6-inch, shovels were used in dry areas or areas with heavy sod. The furrows from the 6-inch shovels were usually 8 to 9 inches wide and 3 to 5 inches deep. The furrows made by both the 4- and 6-inch shovels were wide enough to eliminate the competition from the existing vegetation long enough to allow seedlings to become established. Furrows that were 3 to 5 inches deep protected young seedlings from being grazed to ground level. The furrows also conserved moisture, and they could increase soil water when they were cut with the contour of the land (Chisholm et al. circa 1980).

The South Dakota State University interseeding research project worked from 1965 through 1979 on the development and continual improvement of a pasture interseeding machine that would be suitable for use in semi-arid environments. As a result of a failed alfalfa interseeding field demonstration in 1979, the focus of the interseeding project changed to an investigation of the diseases that affect alfalfa stand establishment and of the methods for control of the pathogens (Vigil 1980).

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Fig. 1. South Dakota State University pasture interseeding machine.



Fig. 2. Pasture interseeding using SDSU toolbar machine.

### Literature Cited

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