Replacing the standard brush on a Woodward Flail-Vac Seed Stripper with a cartridge-wafer configured brush appears to improve seed harvesting efficiency of a grass and forb. The new brush has convoluted openings and stiffer bristles, and costs much less than the standard brush. Information for obtaining mechanical drawings is provided.


**ABSTRACT**

Replacing the standard brush on a Woodward Flail-Vac Seed Stripper with a cartridge-wafer configured brush appears to improve seed harvesting efficiency of a grass and forb. The new brush has convoluted openings and stiffer bristles, and costs much less than the standard brush. Information for obtaining mechanical drawings is provided.


**KEY WORDS**

seed production

**NOMENCLATURE**

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The USDA Forest Service Lucky Peak Nursery near Boise, Idaho, produces seeds of several grass and forb species. Nursery employees asked the USDA Forest Service, Missoula Technology & Development Center (MTDC) to improve the harvesting efficiency on their 6-ft-wide (2-m) Woodward Flail-Vac Seed Stripper (Ag-Renewal Inc, Weatherford, Oklahoma; 800.658.1446; URL: http://www.ag-renewal.com; Figure 1). Attached to the front of a tractor, this harvester uses a spinning brush to strip seeds from grasses and forbs into a catch pan. Nursery employees felt that the brush was pushing the plant seed head away from the harvester, causing too many seeds to fall to the ground.

The original brush (53 cm in diameter [21 in]) has polyethylene bristles (1.9 mm in diameter [0.075 in]) wound in a spiral pattern (Figure 2). These bristles are somewhat flexible and tightly spaced. Spiral-wound brushes must be assembled at the factory and are not easy to modify afterwards. An original replacement brush costs about US$ 2000.

MTDC looked into various brush configurations that might improve the harvester’s performance, and chose to try a cartridge-wafer configuration with stiffer bristles (2 mm in diameter [0.080 in]) and a more open brush pattern (Old Dominion Brush Company, Richmond, Virginia; 800.821.7301; URL: http://www.theodbco.com). The cartridge design incorporates a 2-m-long (6-ft) metal tube with a drive and idle shaft. Individual brush wafers, which look like doughnuts, stack on the cartridge to form the brush. These wafers are convoluted or wavy, leaving alternating voids between the bristles when the wafers are stacked onto the cartridge properly (Figure 3). This approach allows brush configurations to be changed in the field.

A set of wafer brushes costs US$ 310, much less than the cost of an original replacement brush. The cartridge was constructed at the MTDC shop with materials costing around US$ 225, plus 24 h of machine shop and assembly labor. MTDC has prepared a mechanical drawing (MTDC-1052; see below) and a materials list for the harvester modification.

The new brush design was evaluated at Lucky Peak Nursery in July 2005, harvesting wild geranium (*Geranium maculatum* L. [Geraniaceae]; Figure 1) and Arizona fescue (*Festuca arizonica* Vasey [Poaceae]; Figure 4). Convoluted wafers create openings in the bristles for seed heads to enter. As the cartridge spins, the bristles then converge in a wedge, pulling seeds from the heads. There was concern that the vacuum action of the brush might be less effective because of the open gaps in the bristles, but this did not seem to be a problem. Seed losses appeared minimal for both species. Stiffer bristles seemed to do a better job of knocking seeds from the head, but did not appear to pull excessive trash into the catch pan. The Arizona fescue required a second pass in the opposite direction to fully harvest the seeds.

The evaluation at the Lucky Peak Nursery was very limited, but the results were encouraging. Only 2 species were harvested, so this design’s effectiveness with other species is unknown. The nursery staff, however, is confident that the new design does a better job of stripping and capturing seeds than the original brush. If another nursery is having trouble pulling plants into a harvester brush, this new convoluted brush design may be worth considering.

**REFERENCE**