

Pelting weeds with particles instead of spraying them with herbicides

July 21 2014, by Jan Suszkiw

It takes real grit to control tenacious weeds. Although determination is an important attribute in farmers, U.S. Department of Agriculture (USDA) agronomist Frank Forcella is counting on grit of another kind in his approach to battling weeds.

In collaboration with university researchers, Forcella has devised a tractor-mounted system that uses compressed air to shred small annual [weeds](#) like common lambsquarters with high-speed particles of grit made from dried corn cobs. Ongoing field trials may confirm the system's potential to help organic growers tackle within-row infestations of weeds that have sprouted around the bases of corn, soybean and other row crops.

Current organic weed control methods include scorching, soil tillage and hand-pulling, among others. Still, weeds remain a chief agronomic concern requiring new approaches, according to Forcella, with the Agricultural Research Service (ARS) North Central Soil Conservation Research Laboratory in Morris, Minnesota. ARS is USDA's principal intramural scientific research agency.

Dubbed "Propelled Abrasive Grit Management" (PAGMan), the weed control system Forcella is testing disperses 0.5-millimeter-sized grit particles in a cone-shaped pattern at the rate of about 300 pounds per acre using 100 pounds per square inch of compressed air.

This summer will mark a second round of field trials of PAGMan on

multiple rows of silage corn grown on 10-acre plots of certified organic land in Minnesota. Field trial results from 2013 showed season-long [weed control](#) levels of 80 to 90 percent in corn using two treatments of the abrasive grit-one at the first leaf stage, and the second at the three- or five-leaf stage of [corn](#) growth. Corn yields also compared favorably to those in hand-weeded plots used for comparison.

The crop plants escape harm because they're taller than the weeds during treatment and their apical stems (growing points) are protected beneath the soil by thick plant parts.

Results from small-plot studies have been published in *Weed Technology* and other journals.

Read more about this research in the July 2014 issue of *Agricultural Research* magazine.

Provided by Agricultural Research Service

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