GRIT APPLICATION CONTROLS WEEDS IN ORGANIC CROP PRODUCTION. M. Erazo-Barradas\*1, S. A. Clay1, F. Forcella2; 1South Dakota State University, Brookings, SD, 2USDA, Morris, MN (268)

**ABSTRACT**

**Grit application controls weeds in organic crop production**

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Weed management is one of the most challenging production problems in organic cropping systems because of limited weed control methods. Grits, derived from agricultural residues, have been demonstrated to control weed seedlings selectively in corn. This research examined weed efficacy and crop yield of an integrated air-propelled abrasive corn-cob grit (for within-row control) and flame-weeding or cultivation (for between-row weed control) system at varying timings and frequencies in an organic corn crop at Morris, MN. Grit, flaming, cultivation, or grit + flaming, grit + cultivation, were applied as single (V1, V3, V5 corn growth stages), double (V1+V3, V1+V5, and V3+V5), or triple (V1+V3+V5) applications. A split-split-plot design with four replications, which included season long weedy and weed-free treatments, was used. Corn was harvested for silage yield in August and weed biomass in-row and between-row were determined. Corn yield was increased over weedy plots (13,540 kg/ha) when grit was applied at V1 (40%), V3 (29.5%), and the combination of V1+V3 (41.8%). Grit application at V5 alone or in combination with between row methods did not influence yield. At V1, grit + cultivation increased yield over V1 grit alone by about 15% whereas grit + flaming decreased yield by 15% when compared with grit alone. At V3, grit + cultivation increased yield over V3 grit alone by about 7% whereas grit + flaming reduced yield compared with grit alone. Weed biomass within-row was reduced by 71% when grit was applied at V1, by 54% at the V3 application, and by about 80% when grit was applied at V5, V1+V3, V1+V5, V3+V5, and V1+V3+V5 compared with the season long weedy treatment (2940 kg/ha). At V1, grit + cultivation and grit + flaming reduced weed biomass by an additional 17 and 25%, respectively, compared with grit alone. Depending on treatment, other combinations increased control ranging from 3 to 26%. These results indicate that abrasive corn-cob grit for in-row weed control can substantially reduce weed biomass. One application at V1 can increase corn yield. Additional treatments with or after the V1 treatment improved weed control and may increase yield. Waiting until V5 for grit application resulted in 80% in-row weed biomass reduction, however, because weed interference permanently stunted corn growth, there was no positive effect on corn yield. sharon.clay@sdstate.edu

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