

Reduced Tillage Impact on Soil Organisms

Rob Johanson/Goranson Farm

Goranson Farm is a second generation vegetable farm located in Dresden, Maine. First generation farmed primarily potatoes using conventional chemical inputs. Since taking over the farm in 1986, we transitioned to a sustainable, and then to an organic system. We obtained MOFGA certification in 2002. Currently we farm 54 acres organically. We use a four year rotation with half of the acreage in cash crop and the other half in soil building cover crops and soil amendments in any one year. Our biggest concern in growing crops organically was our dependency on herbicides in controlling weeds in potatoes and sweet corn. We invested in numerous types of mechanical weed control implements that include traditional soil tillage equipment like rotivators, plows and disc harrows. Through the years we moved away from the traditional equipment to tine weeders, side knives, Lilliston rolling cultivators, subsoilers, and later, propane burners. While transitioning types of equipment, we also were learning a great deal about ways to improve weed management and soil health.

The first implement we parked was the 8' rotovator. We learned that the impact on the soil structure created a plow pan potentially harder than what using a plow creates. Certainly, plowing an acre was faster than rotovating an acre. We learned that we were saving time by plowing but soil structure and soil organisms were still negatively impacted.

In 2006 we began working with Eric Gallant and Tom Molloy at UMO and Mark Hutchinson at Extension, using reduced tillage techniques for weed management. We planted one acre of winter squash into a hairy vetch/oat cover crop. We used a single shank ripper to loosen up a zone; we then fertilized that zone with fish meal and incorporated it with a small tiller (all but the center tines removed). The first observation was the reduced weed pressure in the no-till zone.

In 2007 we planted an acre of strawberries using the same technique using Yeoman subsoiler instead of the rippers. The Yeoman allowed for deeper tillage with less surface disruption. We also purchased wavy no till coulters to incorporate the fishmeal and thus eliminating the need to reconfigure the rototiller.

Managing the weeds within the row still requires hand hoeing. Between rows we now use a propane burner with shields to protect the plants. The advantage of using propane versus mechanical cultivation is that the soil remains undisturbed, not bringing more weed seeds up into the germination zone.

In conclusion, we feel reduced tillage is better for soil health as well as being an effective weed management strategy. Through the zone till and propane combination there has been a net reduction in fuel use and significant time savings in preparation for field planting.