Ridge tillage as we practice it at Hackmatack Farm is a system of growing vegetable crops in raised ridges formed before planting. Essential to this system is incorporation of winterkilled cover crops and other organic matter into the top surface layer of soil as we form the ridges. Practically speaking, our crops grow on a single-row raised bed. (Photos 1 and 2)

Ridge tillage, in essence a hybrid between raised bed production and single row cropping, offers many of the benefits and advantages of both. With the added component of full-year cover cropping (a field is taken out of vegetable production every second or third year), this system creates soil conditions that favor proper air movement, water movement and residue decay, minimize soil damage or loss, break weed cycles and deplete the weed seed bank, and demand relatively low-intensive management by the farmer.

We designed our system focused on the soil and tillage, as a whole farm system – all other systems for our vegetable crop production (weed control, pest control, fertility, irrigation, labor, etc.) fall under and within the overall scheme of our ridge tillage system. It is a reduced or minimal tillage system in which we use a 32 hp tractor and three basic tillage tools. Once every third year (at the beginning of the cover crop year), we plow with a moldboard plow. We use a disc harrow to prep and cover and eventually turn in cover crop plantings (three per year); we also use the disc harrow to clean up vegetable rows after harvest. The main tool, however, is our ridge-former tool – simply a 3-point-hitch double tool bar with assorted discs and sweeps mounted on it. (Photo 3) We use this once every spring to form the vegetable ridges (Photo 4) and two or three times in early summer to cultivate established crops. We also set this tool bar up with three large shanks for occasional deep ripping if needed or desired.
Going into our eighth year of this system (and our 18th year of MOFGA certified organic vegetable production on most of our fields), we are maintaining levels of organic matter in the 8.0 to 8.9 percent range on our very stony glacial till loam. In 2013, we grossed the equivalent of $40,000 per acre for our vegetable operation, averaging $2.51 per row foot. We are adding only small amounts of compost, manure or other off-farm inputs (straw, seaweed, rock powders, fish meal) and practice a high-residue cover cropping plan.

The typical cover crop or fallow year starts with a planting of oats and peas in spring, followed by buckwheat in midsummer, and by oats, peas and barley in late summer to be winterkilled. We often incorporate compost or manure in this year. Two years in vegetables follow the cover crop year, with different crop families being easily mapped within the ridge system so that no section of field grows the same vegetable family for a minimum of five years, often longer.

We form ridges early in spring, as soon as the ground can be worked, incorporating the winter-killed cover crop into the ridges. In our system, we form two ridges between the tractor tires (set 52 inches apart), so the ridges end up being 26 inches center-to-center. When first formed, our ridges are typically 12 to 14 inches high; after planting and cultivating throughout a season, they end up around 9 inches high.

To plant, we scalp the crest of the ridge with a rake, incorporate soil amendments with a narrow cultivating scratcher, and then smooth the seedbed with the rake. We use an Earthway seeder for most direct-seeded crops, or transplant into the scalped and prepared ridge.

Ridge tillage significantly impacts the soil ecosystem by arranging topsoil in a way that enlarges and optimizes the volume most used by plant roots and the diverse ecology of microorganisms that promote plant growth and health. Figure 2 shows three cross-sectional views of different vegetable bed configurations. View 1 at the top shows an old-fashioned, flat field row cropping, with 52 inches of soil to use between the tractor tires or pathways. View 2 shows a typical 48-inch-wide (at the base) raised bed, which, at 9 inches tall, measures 59 inches along the soil surface, from side to side between the same tractor tires. View 3, our ridge tillage system, shows two raised ridges, each 9 inches tall, which together measure 68 inches along the soil surface from side to side – 30 percent more than the flat field and 15 percent more than the typical raised bed.
MOFGA has a two-row ridge-till toolbar modeled after Nicolas’ equipment in the shared-use farm equipment program hosted in Unity. This toolbar is easily adaptable to a variety of situations and is intended to give growers an idea of how this system might work on their farm. For more information about the toolbar, contact Katy Green at kgreen@mofga.org. This work was supported by the Natural Resources Conservation Service, U.S. Department of Agriculture, under agreement number 69-1218-2-24.