

Reduced Tillage Summary (Massachusetts)

Impact of results/outcomes:

Fourteen growers using reduced tillage on a variety of vegetable crops in Massachusetts were surveyed during winter 2013 to measure the impacts of this SARE project. Thirteen of the growers surveyed have used reduced tillage for less than 5 years, and one grower has used reduced tillage for 10 years. Survey results indicate that their total acreage in vegetable production increased during the project period (2010 – 2013) from 1,174 acres to 1,415 acres: a 241 acre increase. During the project period, vegetable acreage in reduced tillage increased from 247 acres to 609 acres; a 362 acre increase. Acreage in reduced tillage increased at a faster rate than

conventional tillage on surveyed farms, with 43% of their acreage currently in reduced tillage. Six of the growers plan to extend their acreage in reduced tillage by 55 acres in 2014, and only one will reduce acreage by 10. Specific crops grown with reduced tillage are reported in Figure 1. While no differences were reported in incidence of *Phytophthora* blight, other soil factors that influence the occurrence of this disease were improved. The impacts on soil factors reported by growers include less soil compaction and more soil health over all (Fig. 2).

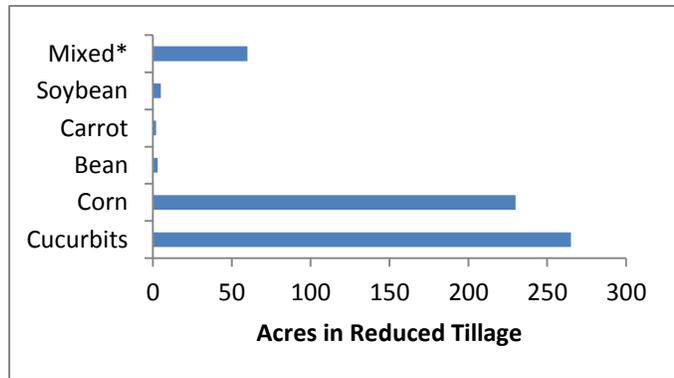


Figure 1. *Mixed crops are from growers who reported total acreage using reduced tillage on pepper, eggplant, squash, corn, greens, and lettuce.

Economic Analysis:

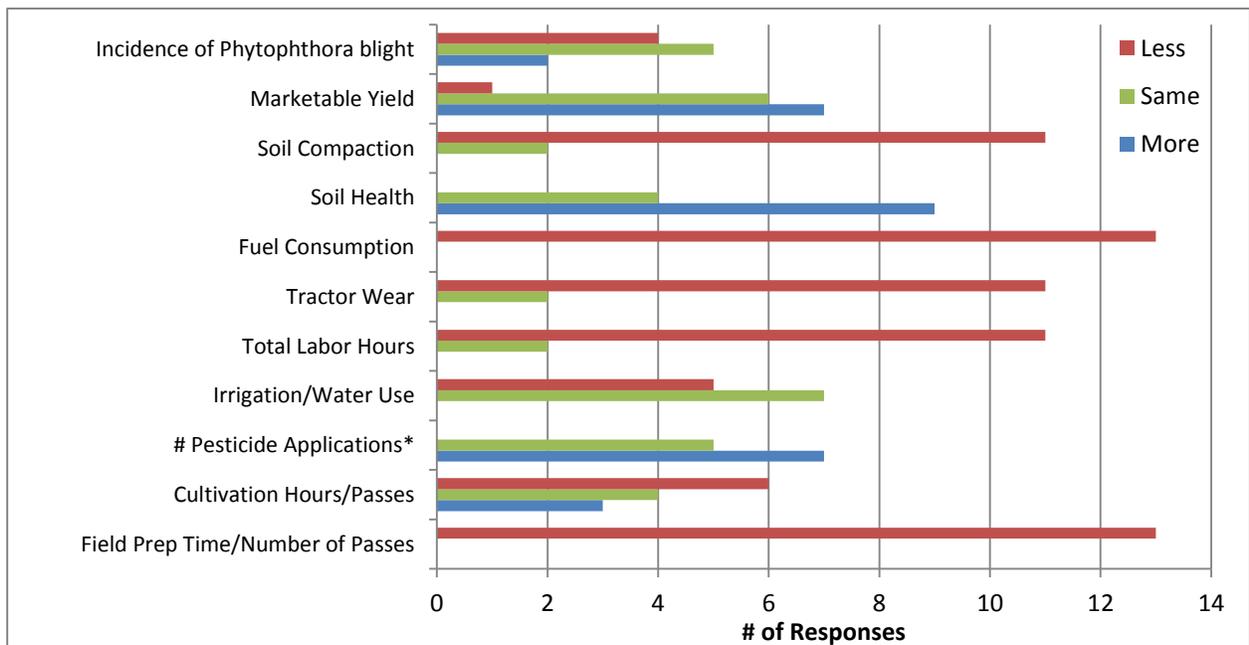


Figure 2. Thirteen farmers responded to questions about impacts of reduced tillage on their farms. *Responses on “# Pesticide Applications” mostly refer to herbicide applications.

Using reduced tillage was expected to impact field preparation, cultivation hours, pesticide applications, water use, labor hours, fuel consumption, soil health, soil compaction, marketable yields and *Phytophthora* blight. All these factors have an influence on the economic viability of the farm. Therefore, growers were asked to report on these factors using the scale of more, less or the same for each of the factors listed in Figure 2. While changes in marketable yield were not greatly increased as a result of using reduced tillage, cost savings during production were widely reported. Eleven growers reported less tractor wear and labor hours, resulting in economic savings. All respondents reported a reduction in field preparation time ranging from 20-66% and a reduction in fuel consumption ranging from 35-70%.

Publications/outreach:

The following articles were published over the duration of this project in the UMass Publication, Vegetable Notes with a readership of over 1,500 people in Massachusetts, New England, and beyond:

Article Title in "Vegetable Notes" Publication	Date of Publication
Getting Started with Deep Zone Tillage	4/19/2013
Updates on Useful Tools in the Vegetable Management Guide and Looking for Growers Interested in Deep Zone Tillage	5/5/12
Reduced Tillage Information & Meetings	1/26/11
Deep Zone Tillage Project at UMass	4/3/10

The following, workshops, on-farm demonstrations, and meetings were held on the topic of reduced tillage during the duration of this project:

Title, Location	Date	Attendance
Building Healthy Soils Workshop, South Deerfield, MA	April, 2013	42
Wards Berry Farm Twilight Meeting, Sharon, MA	June, 2012	80
Reduced Tillage Session, Manchester Conference, NH	December, 2011	65
Deep Zone Tillage Demonstration, South Deerfield, MA	July, 2011	75
Making Reduced Tillage Work on Your Farm, Webinar	February, 2011	na
Deep Zone Tillage Twilight Meeting, Hadley, MA	August, 2010	60

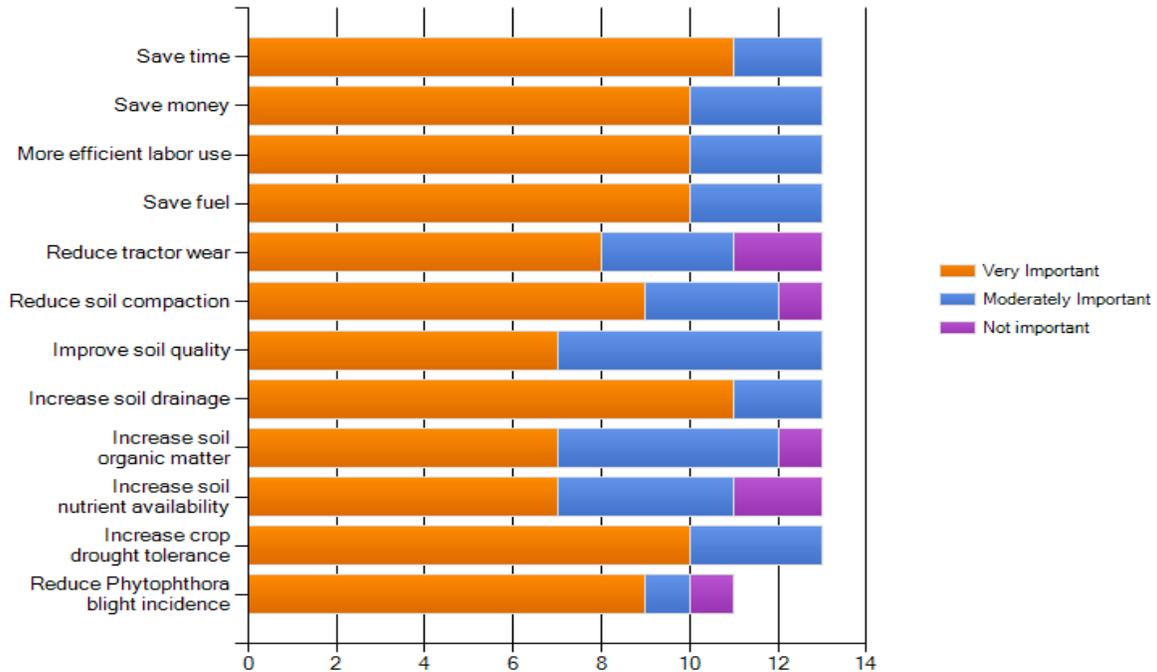
In a 2013 survey of Vegetable Notes readers, with a 23% response rate (340 people), readers were asked the following question: As a result of information provided by UMass Extension through meetings, newsletters, websites, or other means, do you use reduced tillage practices? Seventy three growers or 28.7% of respondents use reduced tillage practices as a result of UMass Extension outreach.

Farmer adoption:

Fourteen growers using reduced tillage surveyed during winter 2013 were asked about the relative importance of benefits of using reduced tillage (see Figure 3). Saving time and costs as well as increasing soil drainage and crop drought tolerance were among the most important benefits. The most promising adoption of reduced tillage came from the 13 growers who bought reduced tillage equipment in Massachusetts as a result of outreach conducted during this project. Outreach included on-farm demonstrations and lending equipment to growers. Farmers were most likely to adopt reduced tillage practices when they were able to borrow the equipment and try it for themselves or if they attended a

field demonstration. Growers will continue to have access to borrow the UMass Deep Zone Tiller during the 2014 season. Six growers have requested to trial the equipment already this year.

Please assess the relative IMPORTANCE of the following BENEFITS of using RT on your farm:



Areas needing additional study:

Among the 14 growers using reduced tillage surveyed during winter 2013 asked about the challenges of using reduced tillage on their farms, two growers reported herbicide application timing and crop establishment to be a major challenge. Three growers reported cost of unit, need for high tractor horse power, and rocky soils to be a major challenge. Five growers reported dependence on Roundup and weed control to be a major challenge of using reduced tillage. Reduced tillage unit size, crop rotation, and lack of knowledge or experience with reduced tillage were reported as being minor issues. Another challenge reported was difficulty in moving larger units around on busy suburban roads. Herbicide resistance, new disease or pest issues and ease of use, were mostly not issues for growers using reduced tillage. We have received inquiries from Organic farmers who are interested in reduced tillage for their farms. Thus far, very little of our research and outreach have directly addressed non-herbicide methods for using deep zone tillage. This topic needs further research and extension efforts in New England.