

# Reducing Climatic and Disease Risks Through Minimum Tillage Systems for Vegetables

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## Rationale:

Reduced and modified tillage (RT) systems (e.g. no-, zone-, strip) represent strategies to reduce soil degradation and erosion and protect water quality. It has been shown that zone and deep zone tillage (DZT) systems can provide the environmental and economic benefits of an RT system for many vegetable crops without the harvest delays or losses observed in straight no-till. Each season, more vegetable growers express interest or try RT on their farms. To insure long-term sustainability of this production system for vegetables, we are focusing on evaluation of RT systems for their ability to ameliorate large fluctuations in water supply, which are likely to worsen as a result of climate change. By improving soil water management, RT systems may help reduce crop losses to flooding, drought and vegetable diseases like *Phytophthora capsici*. As well as the trials at the UMass research farm, we have partnered with six growers who are experimenting with split-field trials (1/2 RT, 1/2 conventional) on their own farms.

## Research Goals:

- Do RT systems reduce fluctuations in field moisture in comparison to conventional (moldboard plow & disk) systems?
- Do RT systems mitigate the impact of disease caused by *Phytophthora capsici*?
- Are there differences in crop growth & yield between RT and conventional systems?

## Measurements Include:

- Field moisture is measured every 1/2 hour at two depths in each system.
- Disease incidence and spread is recorded, when present.
- We are measuring crop emergence, above ground biomass, and yield.

## Treatments:

- Deep Zone Tillage vs. conventional tillage (moldboard plow and disk)

## Acknowledgment (funding source):

We would like to thank NE SARE for providing the funds for this research. Results will be provided by SARE and available on our website ([umassvegetable.org](http://umassvegetable.org)).

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