

## Hybrid Mulch System Impacts on Production and Economics

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The hybrid mulch system is a grower developed combination of sustainable agricultural practices designed to address concerns of growers in the northeastern United States. In this system vegetables are grown on fall established, plastic mulch covered, raised beds with a living mulch inter-bed of perennial ryegrass and white clover. The beds remain in place for up to 3 years, and the system aims to reduce waste plastic and the need for herbicides and tillage.

An evaluation of the system and its impact on production and economic factors was carried out at Highmoor Farm, in Monmouth, Maine from 2004 to 2007. The objective of this study was to evaluate a hybrid mulch system compared to a traditional spring bed system in terms of plastic durability, yields, depletion of soil nutrients and economic returns.

Two crop rotations of three vegetables; TCP: tomato (*Lycopersicon esculentum* Mill.), cucumber (*Cucumis sativus*), pumpkin (*Cucurbita pepo*) or CTP; cucumber, tomato, pumpkin were grown in a traditional production system with plastic mulch in the rows and bare ground between the rows and compared to the same two rotations grown in a hybrid mulch system.

The hybrid mulch system produced yields greater or equal to the traditional spring planted system in the first 2 years, but lower yields in the third year. The loss of phosphorus, potassium and organic matter was equal and nitrate nitrogen increased in the surface soils of the hybrid mulch system over the first two years in comparison to the traditional system. At the 20 cm sampling depth, the loss of nitrate nitrogen was higher in hybrid mulch beds after three cropping seasons than it was in traditional beds, but the loss of potassium and soil organic matter was same, and the loss of phosphorus was lower in hybrid mulch beds than traditional. Three types of long life plastic were tested and showed no differences in terms of either durability or yields. Economically, with a tomato, cucumber, pumpkin rotation, net returns were doubled and

with a cucumber, tomato, pumpkin rotation, net returns remained stable in comparison to a traditional production system. Major cost differences between the two systems were due to mowing, increased time spent weeding and planting, and increased harvesting costs in one rotation.

An important factor in the success of this system appears to be in its ability to allow earlier planting dates which is primarily important for growers in regions with short growing seasons or wet springs.