

## CONSERVATION TILLAGE RESEARCH IN MASSACHUSETTS

Stephen J. Herbert and Peter F. Waldron  
 Department of Plant and Soil Sciences  
 University of Massachusetts

Over the past four growing seasons, tillage research at the University of Massachusetts Research Farm in South Deerfield has experienced several variations of 'typical' New England weather. The summer precipitation, May through August, for 1981, 1982, 1983 and 1984 was 31.5cm (12.4"), 47.5cm (18.7"), 32.1cm (12.6") and 49.5cm (19.5") respectively. The 30 year norm for May through August shows 37.9cm (14.9") with an even distribution of more than 9cm each month. Rainfall these past four years has not been typical with some months receiving more and others less rainfall than is shown by the norm. In 1984, for instance, more than 60% of the rainfall came in May (late) after most corn had been planted in the Connecticut River Valley.

Table 1. shows the yield results for the previous four years. Yields were consistently, although not statistically, higher for the moldboard plow - disk treatment compared to other tillage treatments. Mostly the yield differences have been small and in all cases less than three tons per acre of 70% moisture silage. The largest difference was between moldboard plow - disk and no-till in 1984. Yields in this experiment were quite variable as a result of uneven stand establishment. The variable stands were probably related to the heavy rains between planting and emergence. No-till plots had more variation than moldboard plow - disk plots. Thus the tendency for the lower yield with no-till could be the result of poor stand establishment rather than a reduction in later plant growth.

Table 1. Tillage influence on corn silage yields for four consecutive years.

Tillage	1981	1982	1983	1984
-----tons/acre 70% moisture-----				
MB Plow-Disk	25.9	20.5	25.1	28.9
Double Disk	25.7	19.7	23.6	28.1
Chisel Disk *	25.2	18.6	24.2	26.9
No-Till	25.5	17.9	23.8	25.9

\*Tillage in 1981 was with a plain disk harrow whereas all other disk passes were with a notched harrow.

Conventional tillage using the moldboard plow and disk harrow does give good consistent results in most soils in Massachusetts. While these results from the river bottom soil in the Connecticut River Valley may not represent most soil conditions in other regions of Massachusetts, it is clear that many farmers have a tendency to overwork soils with repeated secondary tillage. Research studies at other Massachusetts sites by us and others have also shown that conservation tillage is a viable alternative to the intense conventional tillage that sometimes abuses the soil resource and possibly contributes to excessive soil erosion.

Massachusetts in 'normal' years has sufficient moisture evenly distributed so that there is seldom a severe shortage limiting growth, especially early in the season. Thus no-till corn yields are unlikely to exceed conventional tillage as they do in other drier regions with sandy soils. If done correctly with a good planter and with proper attention given to planting and weed control, no-till and other reduced tillage systems should yield about the same as conventional moldboard plow-disk systems. If you are hesitant or unable to commit yourself to no-till, then an alternative to conventional tillage on sandy loams and silt loams might be a single heavy disking before planting or the use of the chisel plow with the disk.