

DEEP TILLAGE IN THE NORTH DELTA
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Abstract

Deep tillage was compared to tillage using three tillage methods; no-till, reduced and conventional tillage. In one trial where reduced tillage was practiced we had substantial increases in yield the first two years with only a small increase in yield the third year. The deep tillage using a para-till plow was used each year. The deep tilled plots showed much less water stress than the control. In another trial deep tillage was compared to non deep plowed plots in no-till, reduced, and conventional tillage. These were deep plowed in 1998 before planting and were not deep tilled in 1999. The first year there was a large increase in yield in all of the tillage methods. However, in 1999 the no-till deep tilled plot yielded less than the unplowed no-till plot.

Introduction

In the Missouri Bootheel many of the soils have a hardpan that restricts water penetration and root growth. The hardpan extends from five to fourteen inches. The crops are under water stress within six days after a major rain. The practice of deep tillage has largely been discontinued since the advent of herbicides, which made burying weed seed unnecessary. Some producers in the area are using a para-till plow to eliminate the hardpan.

Discussion

Starting in 1997, in one trial deep tillage is being evaluated on a silt loam soil using a stale seedbed using a reduced till method of tillage. The soil was paratilled each year at a depth of fourteen inches a few days ahead of planting. The chisels are arranged so two enter the soil in every other furrow which is not used by the tractor tires. The center furrow will have two chisels in it and none will be in the adjacent furrows since they are used by the tractor tires. Harvest is difficult if chisels are used in the furrows that are used by the picker wheels. The trial consisted of eight row plots using 38 inch rows. The plots ran the length of the field. It was replicated four times and data was evaluated using analysis of variance. During the summer water stress was much less evident in the paratilled plots.

Starting in 1998 in another field deep tillage was evaluated under no-till, reduced till (stale seedbed) and conventional tillage methods. Deep tillage was used only in 1998. In 1998

large increased in yield were found in all of the tillage methods. In 1999 large yield increases were observed in the conventional and reduced tillage systems. However, no-till had a lower yield when it had been deep plowed

Summary

The results of these trials show that in the silt loam soils of Missouri, deep tillage is a very profitable practice considering the cost is only twelve dollars per acre. The deep tilled crop show much less water stress during periods of drought.

References

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	Yields		
	1997	1998	1999
With Paratill	942	787a	851a
Without Paratill	808	729ab	832a
% increase	14%	7%	2%
LSD	181#	140#	103#
CV	13.11	13.86	7.71

	Yields	
	1998	1999
Reduced with paratill	694a	873a
Conventional with paratill	624ab	848a
No-Till with paratill	603ab	758ab
Reduced without paratill	566b	789ab
Conventional without paratill	433c	653b
No-Till without paratill	419c	790ab
LSD	103#	132#
CV	12.92	11.16

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