Paraplowing & beans on steep slopes to be studied

COSHOCTON, Ohio — Crops of soybeans and crops will rotate after chisel plowing, paraplowing and no plowing on steep slopes at the USDA North Appalachian Experimental Watershed starting in 1984.

The beans and paraplow will be tried for the first time on slopes as steep as 18 percent in the Agricultural Research Service Watershed, says C. R. Amerman, location leader.

"Soybeans are rarely grown on steep lands because past experiences with conventional tillage show severe erosion losses," Amerman says. "New technology may eliminate the erosion problem as the reason for limiting soybean production to nearly flat lands. For instance, the paraplow shatters soil below the surface without turning it over and without destroying the surface mulch."

The 6-year conservation tillage study will be conducted by scientists of the Ohio State University - Ohio Agricultural Research and Development Center, Wooster, Ohio, and Experimental Watershed scientists here. The Ohio scientists cooperated in U.S. trials of the English paraplow.

Purpose of the research is to study conservation tillage systems, including fertility, diseases, pests, machinery and losses of water, soil and chemicals from slopes in corn-soybean rotations, Amerman says, and "to evaluate yields of corn and soybeans under conservation tillage practices in steep watersheds.

"A major restriction to land use may be lifted if we can demonstrate control of water, soil and chemical losses from hillsides. If we can not demonstrate this control, we can caution farmers against trying to bring the corn-soybean rotation into the hills."

Some scientists say conservation tillage, especially reduced tillage, offers advantages in many locations, including flat lands, where it has not been tried. "My firm belief is that no-till or ridge-till with surface residue is feasible on any soil in the Corn Belt," says William C. Moldenhauer, research leader at the National Soil Erosion Laboratory, Purdue University. He says farmers can use no-till on well drained soils and "make ridge-till with surface residue work even on the subsurface-drained, dark colored prairie soils in Illinois, Indiana and Northwestern Ohio, on Clarion-Webster soils in Iowa and Minnesota, and on well drained soils where temperatures are a problem in the spring."

Amerman says more than 40 years of studying tillage on the contour and up, down and across slopes at the Experimental Watershed, including almost 20 years of growing corn without tillage, provide a basis for the corn-soybean rotation research. On July 5, 1969, for example, a rain storm moved more than 36 tons of soil from 1.61 acre, poor-practice field that had been plowed and tilled across a 7 percent slope. The topsoil from a single acre, 45,300 pounds, would have loaded an 18-wheel, semitrailer truck.

The 63 pounds of topsoil from an acre of untilled corn in contoured rows on a 21 percent slopw might have overloaded a little man with a big scoop shovel. Soil eroded from clean-tilled corn in contoured rows on a 6 percent slope weighted 6,430 pounds an acre — loads for 100 big men with big shovels.

With only 5 years of research on "no-till" corn, the ARS scientists thought the July 1969 results "too good to be true," says William M. Edwards. "Although these results are impressive," he and another Watershed researcher wrote in 1972, "one cannot conclude that continuous no-till corn is possible on such steep slopes without the threat of serious erosion ... Two more corn years have passed with no erosion (from the no-till plot) but the watersheds have not been subjected to any additional severe storms."

Severe storms are infrequent, but they cause the most damage and accent the erosion difference between clean tillage and no tillage on slopes. "The 10 worst storms in 40 years, for example, or the 10 worst of 1000 may cause 90 percent of the erosion during the measuring period," Edwards says. Soil loss from the 10 biggest storms

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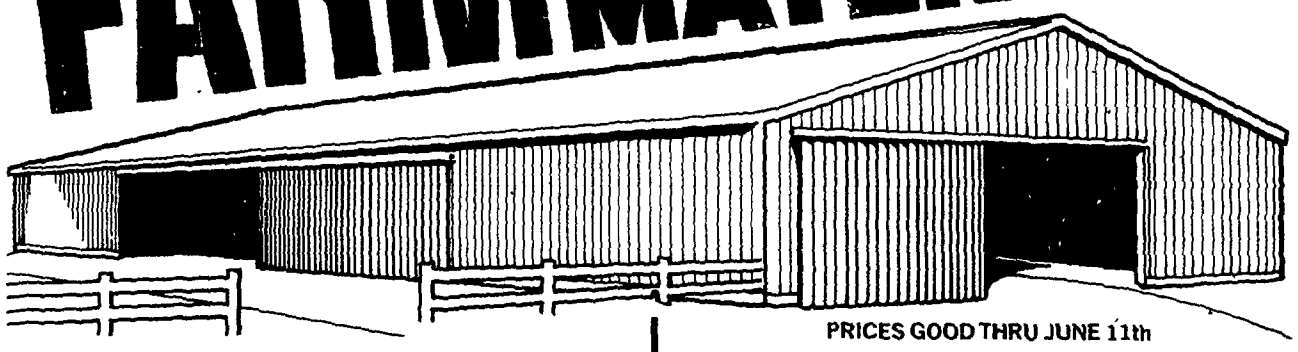

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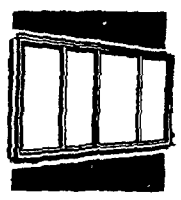

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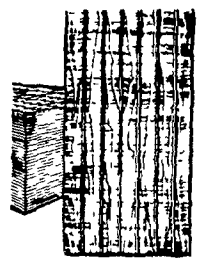

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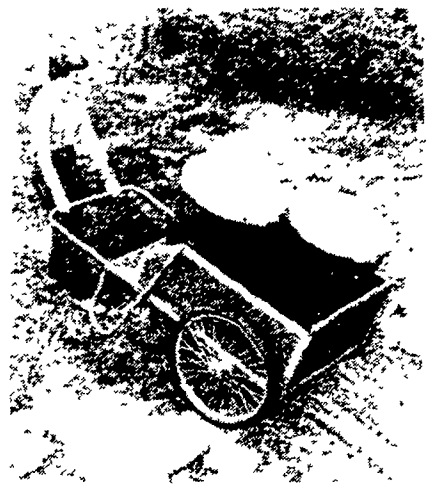

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