

Dry Creek Long-term Watershed Study: Effects of Harvesting on Soil Movement using Mesh Bag Technique

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Abstract: The mesh bag method can be used in field conditions to sample eroded soil. It is a simple, inexpensive method to collect erosion data. This field method has the potential to improve the management and conservation of soils. In 2003, Florida A&M University, USDA Forest Service, and International Paper began a cooperative project to evaluate the management effects of forest and streamside management zones (SMZs) on soil erosion movement using a mesh bag field method as a part of IP's Dry Creek Long-term watershed study. Triplicate plots, each 10x10 m, located in Decatur County, Georgia were installed over a two-year period in the reference and treatment watersheds to determine the effects of groundcover type and harvested treatments on soil erosion. Testing of the 20x20 cm mesh bag indicated there was no significant difference ($p < 0.05$) between the slash groundcover and the reference. However, there was a significant difference between groundcover types. Further testing indicated there was no significant difference among the SMZ harvesting treatment. Preliminary findings indicate groundcover is critical to reducing soil erosion and maintaining the SMZs free from surface disturbances is vital to soil conservation.

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Economic performance of alternative tillage systems in the northern Corn Belt

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Abstract: Although no-till has been successful in warmer, drier areas, there are continued challenges with its use in cool, wet areas. Strip tillage has been developed as an alternative that may provide many of the conservation benefits of no-till while maintaining productivity and economic returns. The economic risks and returns of eight tillage treatments, including moldboard plow primary tillage, chisel plow primary tillage, no-till, and five strip tillage alternatives (fall residue manager, fall residue manager + mole knife, spring residue manager, spring residue manager + mole knife, fall residue manager + subsoil shank) were evaluated for a corn-soybean rotation in West Central Minnesota from 1997-2003. Highest average corn yields were obtained under the fall residue manager + mole knife tillage system, while the moldboard plow system had the lowest corn yield variability. Highest average soybean yields were obtained under the moldboard plow system, with the lowest soybean yield variability obtained with the fall

residue manager tillage system. The no-till system showed the highest average net returns, but also the highest variability of net returns. Four of the strip-tillage systems had net returns comparable to the no-till system, but with lower risk. The moldboard plow system had the lowest average net returns. Growers in the Northern Corn Belt may be able to reduce tillage while increasing economic returns and reducing risk.

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Effect of natural clay deposits and irrigation water quality on productivity of tomato and water use efficiency under drip irrigation

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Abstract: Water is the essential and strategic element for life. It is essential resource for any development process specially in agriculture and in particular in arid region such as Saudi Arabia. Agriculture sector in the Saudi Arabia consume more than 85% of the total consumed water. Therefore, water saving and water conservation will have an important impact on water resources. The management that increase yield and reduce excessive amount of water is a priority for agriculture development in arid and semi-arid regions. This research investigated the effectiveness of subsurface drip irrigation placed at (25 cm) and the clay with different water quality on tomato yield, water use efficiency (WUE), soil moisture and salt distribution in the root zone. A calcareous sandy soil had a subsurface amendments with subsurface drip irrigation applied for one year and planted with tomato seedlings. The clay deposits were collected from western (Khulays) of Saudi Arabia. The results clearly reveal that nutrients levels in all the experimental plots were quite variable depending on the amendments type, and rate of application, and the irrigation systems. Results show that tomato fruit yield and WUE were significantly affected by amendments, water quality and also by irrigation amounts and system. The soil moisture contents of subsurface drip irrigated layer increased dramatically, while salts accumulated at the surface away from the emitters of subsurface drip irrigation.

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Effect of Organic Matter Buildup on Yield in Long-Term Conservation vs. Conventional Tillage

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Abstract: In 1978, we set up long-term tillage plots to determine the effect of organic matter on row crop production in southeastern coastal plain loamy sand soils. Plots were cropped to a two-year rotation of corn, wheat, and soybean or cotton; each year both parts of the rotation were cropped in