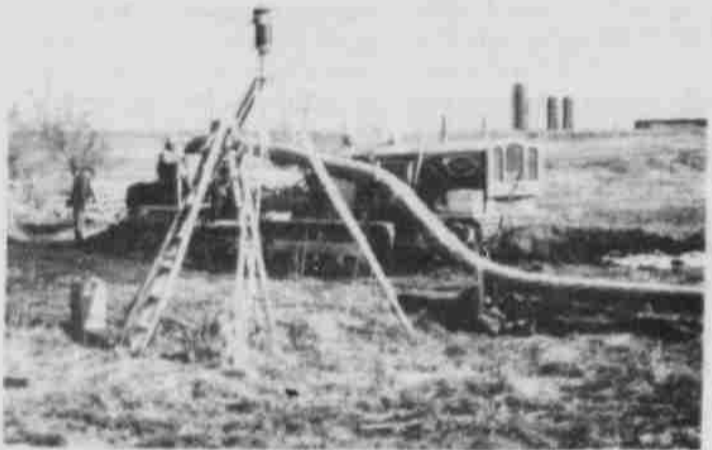


Morrow Co. farms monitored for erosion



Maintaining a good straw mulch near the soil surface insulates the ground against evaporation, improves moisture infiltration, and saves soil.



Interest in tile drainage has increased in Northern Morrow County during this past year. Five projects were completed with many being recycled back into existing irrigation systems.

Several farms in Morrow County are being evaluated for their susceptibility to water erosion. Farms with significantly contrasting amounts of residue have been selected for this study. The primary objective is to consider the value of crop residue for reducing soil erosion.

Decisions to maintain crop residue must begin after harvest. For optimum water storage, stubble should be left standing over winter. An exception to this is serious weed problems or restrictive tillage pans, which may need to be treated immediately.

Primary tillage should be delayed in the spring for as long as possible to avoid working wet ground. Early tillage in wet conditions typically reduces the largest amount of residue cover, does a marginal job of controlling weeds, and causes compaction and tillage pans. In addition, early tillage tends to be too deep, which buries too much residue.

A good example of this last point is running a disk four inches deep. Surprisingly, surface residue will be reduced 50 percent or more. With a 20 bushel wheat yield, initial residue cover of 2,000 pounds per acre will be reduced 1,000 pounds per acre or more after disking. Running a disk deeper can approach the

associated problems, very small amounts of rainfall readily puddle the soil surface. A saturated soil is extremely susceptible to evaporation losses and runoff. Obviously, dryland farmers cannot afford to lose either moisture or soil.

An unfortunate consequence of numerous fall rodweedings was late seedings. The wheat growth is poor throughout the entire winter erosion period when the planting is late. As of mid-January, fields planted in the beginning of November had less than one percent growing ground cover. Fields planted in mid-October had about five percent growing ground cover. Both of these ground covers are not adequate in themselves to prevent soil erosion. Consequently, crop residue must be relied upon almost exclusively to provide soil protection.

Observations indicate that maintaining about 1,500 pounds - acre of residue at seeding time provides excellent protection against water erosion on moderate slopes. The above photo shows a field with 1,500 pounds per acre of residue on the surface, and there is an additional 1,000 pounds per acre of residue incorporated in the top four inches. A well mulched soil condition increases water infiltration and penetration compared to a bare ground condition. The former also tends to freeze less densely and shallower than the latter. This characteristic is critical in the winter when warm temperatures begin soil thawing. An unprotected soil thaws slowly, leaving a layer of saturated soil on top of dense, impenetrable

results of mold board plowing.

Succeeding tillage may bring buried residue back to the soil surface, but in the meantime your field is susceptible to erosion. An early herbicide application is probably a better alternative to early tillage. A well-timed herbicide treatment will accomplish better weed control, enable you to delay your first tillage and help you store more moisture by not disturbing the stubble.

Fall tillage can create similar problems as early spring tillage. Rodweeding this fall had a dramatic impact in the top few inches of soil at our monitoring sites in the county. Abundant rainfall in September and October stimulated a seemingly unending supply of cheatgrass plants. Many fields were rodweeded two to three times this fall alone, but cheatgrass kept emerging with additional rain. Two problems have become evident this winter on these soils with additional rainfall. First, a tillage pan formed by the rodweeder acts as a barrier to moisture penetration. Second, soil structure above the rod pan is destroyed by weeding. The rate of moisture penetration through the soil is strongly influenced by the structure. The more the soil is pulverized, the slower the permeability. With both of these

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