

**Natural Resources Conservation Service
Report To
Papio-Missouri River NRD Board
December 12, 2013
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Managing for soil health is one of the best ways farmers can increase crop productivity while improving the environment.

Results are often realized immediately and last well into the future. Following are four basic principles to improving the health of your soil.

- Keep the soil covered as much as possible
- Disturb the soil as little as possible
- Keep plants growing throughout the year to feed the soil
- Diversify as much as possible using crop rotation and cover crops

Cover Crop Technology Continues to Advance Rapidly

Cover crop mixtures need to be developed for the resource concern identified. Cover crops benefit issues such as soil erosion, soil compaction, soil moisture management, nutrient cycling, residue management, increased soil organic matter, weed control, and increased forage for grazing.

Grazing Potential

Cover crop mixtures planted after harvest can provide high quality forage late in to the fall. Cover crop plantings can also provide opportunities to rest pastures and rangeland during the growing season.

Nutrient Management

Species selection for recovering residual nitrogen can include species that have a fibrous root system to recover nitrogen in the upper soil profile as well as deep tap root systems to recover nitrogen below two feet.

Soil Moisture Management

In northeast Nebraska planting a row crop into last year's crop stubble can be an issue due to wet soil conditions. Cover crop species that develop a canopy early in the fall to improve residue decay mixed with species that can utilize spring soil moisture are the key to addressing this resource concern.

Soil Compaction

Winter cover crops with large taproots can alleviate the effects of soil compaction by penetrating the compacted layer when the soil is wet and relatively soft during the winter, leaving channels that enable water, air and cash crop roots to penetrate the soil profile more easily during the summer when the soil is dry and hard. This action has been dubbed "*biological drilling.*"

Soil Erosion

Cover crops are currently being used in Nebraska to control both sheet-rill and ephemeral gully erosion. One to two bushels of cereal rye are drilled in the fall following harvest of a low residue crop such as soybeans. Ephemeral gully areas should be shaped and smoothed with a blade prior to drilling. The cover crop should be left growing in ephemeral gully areas and not terminated until the cash crop can provide adequate canopy cover for erosion control.

Weed Management

Cover crops can influence weeds either through competition with living plants, as cover following cover crop termination, or through allelopathy, the production of compounds that inhibit weed seed germination. Generally however, living cover crops will suppress weeds more completely and at more phases of the weed life cycle than will cover crop residue. Living cover crops absorb light and thus inhibit seed germination. Perennial weeds are generally better competitors and are more difficult to control with cover crops.

FARMING FOR SOIL HEALTH SHOWS BENEFITS

In drought stricken Kansas, a farmer sees the benefits of soil health in 2013.

“This summer was one of the driest summers we have had in a long while. This year we ended up with corn to harvest (many of the neighbors did not get combines out) and also lots of summer cover to keep the cattle grazing and rest the grass.”

No-till corn with cover crop made 58bushels/acre on 7 inches of total rainfall. For reference, the 2012 dry land yield average was 31.2 bushels/acre.



Conventional till corn planted into worked wheat stubble made 5 bushels/acre.





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