Conservation tillage... leaving last year's crop residue on the soil surface by limiting tillage. Includes no-till, mulch till and ridge till.

How it works

Leaving last year's crop residue on the surface before and during planting operations provides cover for the soil at a critical time of the year. The residue is left on the surface by reducing tillage operations and turning the soil less. Pieces of crop residue shield soil particles from rain and wind until plants can produce a protective canopy.

How it helps

- Ground cover prevents soil erosion and protects water quality.
- Residue improves soil tilth and adds organic matter to the soil as it decomposes.
- Fewer trips and less tillage reduces soil compaction.
- Time, energy and labor savings are possible with fewer tillage trips.

Planning ahead

- Will your crop produce enough residue?
- Is crop residue management part of a planned system of conservation measures?
- Do you have the needed equipment?

Tech notes

- Planning for residue cover begins at harvest. Ensure ample residues are spread evenly over the field by the combine.
- Reduce the number of unnecessary tillage passes. Every tillage pass buries more crop residue.
- Use straight points and sweeps on chisel plows instead of twisted points. Twisted points can bury 20% more residue.
- Set tillage tools to work at shallower levels.

Measuring crop residues

You can estimate residue levels by using a line that has 50 or 100 equally divided marks. Stretch the line diagonally across crop rows. Count the number of marks that have residue under the leading edge when looking from directly above the mark. Walk the entire length of the rope. The total number of marks with residue under them is the percent residue cover. If the line has only 50 marks, multiply your count by two. Repeat this three to five times in a representative area of the field.

23 Wetland enhancement... installing practices such as dikes in existing wetlands to manage water levels and improve habitat.

How it works

Most wetland enhancement work includes small structures built to add water or regulate water levels in an existing wetland. Subsurface and surface drains and tiles are plugged. Concrete and earthen structures—usually dikes or embankments— are built to trap water. These practices maintain a predetermined water level in an existing wetland. Adjustable outlets allow the landowner to fluctuate the water level during different seasons. Enhancement also includes planting native wetland vegetation if plant populations need to be supplemented.

How it helps

- Wetlands filter nutrients, chemicals and sediment before water infiltrates into ground water supplies.
- Wetlands provide habitat for waterfowl and many other species of wildlife.
- Wetlands add beauty and value to a farm.

Planning ahead

- Will soil hold water?
- Is there an adequate water supply?
- Is there adequate upland wildlife habitat available?
- What wildlife do you want to attract?
- Will plugging drains or breaking tile lines to enhance the wetland have adverse effects on other parts of your farm, or a neighboring farm?

Tech notes

- Remove trees and brush from embankments and the vegetative spillway area.
- Protective vegetative cover should be established on exposed surfaces of embankments and spillways.
- Obtain any necessary permits.
- Keep livestock from the area, unless it is included in a planned grazing management plan.
- Dikes and levees should meet NRCS or US Army Corps of Engineers standards.

Maintenance

- You may need to replant some wetland vegetation until a good stand is established.
- Keep burrowing animals out of earthen structures. Control beavers and muskrats.
- Keep intakes clean and outlet free of debris.
- Inspect pipe structures and repair any damages.

Crop rotation... changing the crops grown in a field, usually year by year.

How it works

Crops are changed year by year in a planned sequence. Crop rotation is a common practice on sloping soils because of its potential for soil saving. Rotation also reduces fertilizer needs, because alfalfa and other legumes replace some of the nitrogen corn and other grain crops remove.

How it helps

- Pesticide costs may be reduced by naturally breaking the cycles of weeds, insects and diseases.
- Grass and legumes in a rotation protect water quality by preventing excess nutrients or chemicals from entering water supplies.
- Meadow or small grains cut soil erosion dramatically.
- Crop rotations add diversity to an operation.

Planning ahead

- Will rotations meet crop base needs for set aside?
- Do you have use for other crops?

Tech notes

- Crops must be suited to your soils.
- Design crop rotations to meet the residue needs of your crop residue management plans.
- Rotations that include small grains or meadow provide better erosion control.
- Small grains and meadow can always be used to replace any row crop or low residue crop to gain better erosion control.
- Corn (grains) can always be used to replace soybeans or any other low residue crop in the rotation to gain better erosion control.
- For crop rotations which include hay (meadow) the rotation can be lengthened by maintaining the existing hay stand for additional years.

Maintenance

- Switch crops to maintain perennials in the rotation, if necessary.
- Consider herbicide carry over to avoid crop failures.

25 Nutrient management... applying the correct amount and form of plant nutrients for optimum yield and minimum impact on water quality.

How it works

After taking a soil test, setting realistic yield goals, and taking credit for contributions from previous years' crops and manure applications, crop nutrient needs are determined. Nutrients are then applied at the proper time by the proper application method. Nutrient sources include animal manure, sludge, and commercial fertilizers. These steps reduce the potential for nutrients to go unused and wash or infiltrate into water supplies.

How it helps

- Sound nutrient management reduces input costs and protects water quality, by preventing over-application of commercial fertilizers and animal manure.
- Correct manure and sludge application on all fields can improve soil tilth and organic matter.

Planning ahead

- Have you tested your soil and livestock manure for their nutrient levels?
- Are organic wastes or sludge available for you to use?
- Have you determined realistic yield goals?
- Are proper soil conservation measures installed?
- Have you accounted for nitrogen credits produced by legume crops?

Tech notes

- Choose best application method. Use broadcast, starter, surface band or injection.
- Use the late spring nitrogen test when appropriate when corn plants are between 6 to 12 inches tall.
- Refrain from applying commercial nitrogen in the fall except if N is associated with P application.
- Avoid applying manure on frozen or snow-covered ground if possible.

Maintenance

- Test soils once every three years according to Extension recommendations.
- Analyze manure and other organic waste for nutrient content before field application.
- Establish a winter cover crop if there's a possibility of nitrogen leaching because of poor crop yield.