

NO-TILLAGE FARMING

What is no-tillage farming?



The Hiwassee River Watershed Coalition's Great Plains no-till grain drill (pictured above) is available for low cost rental.

No-till farming is defined as farming where the soil is left relatively undisturbed from harvest to planting. During the planting operation, a narrow seedbed is prepared or holes are drilled in which seeds are planted. Disc openers, coulters and other tools used to create the seedbed or slots leave most of the ground surface and previous crop residue largely undisturbed. Weeds, insects and disease outbreaks are commonly managed with some combination of herbicide application, crop rotation, fire, sanitation or other biological means. No-till is considered a management tool under what is known as conservation tillage practices. The difference in practicing no-tillage versus the other forms of tillage classified as conservation tillage is primarily the degree to which the soil is disturbed. Some forms of conservation tillage are better suited to specific soil types or crops being produced.

Why practice no-tillage farming and other conservation tillage practices?

No-tillage farming and other conservation tillage practices are based on two basic principles: (1) minimization of the ground surface during planting and (2) minimization of the removal of crop residues during seedbed preparation and harvesting. According to a 1995 bulletin (Soil Fertility Note 16: Gearing up for Conservation Tillage) issued by the North Carolina Department of Agriculture and Consumer Services (NCDA&CS) Agronomic Division, over 25% of North Carolina's cropland is managed under some form of conservation tillage. The bulletin suggests the following reasons for adoption of these practices:

- They significantly reduce soil erosion, helping preserve the long-term productive capacity of the managed fields;
- The practices can increase farm profits by reducing tillage costs without reducing crop productivity; and
- The practices are routinely incentivized in policy-oriented documents such as the farm bill by affecting the funding mechanisms available to growers.

While considering converting to conservation tillage practices such as no-tillage, it is important to do research and develop a site-specific conservation strategy that takes into account such factors as the local climate and soil conditions as well as the type of crops being produced. When conservation tillage practices implemented are suited to local growing conditions, farmers typically improve the economic efficiency of crop production while also better protecting the environment.

What are the Pros/Cons of No-Tillage and Conservation Tillage Practices?

Pros

- No-till requires less fuel/equipment operation time. This improves air quality by reducing dust and emissions from equipment operation. No-till also improves air quality by releasing less carbon from the soil into the atmosphere than traditional plowing practices.
- Crop residue preserved during no-tillage farming helps to maintain infiltration rates from rain and irrigation water. Evaporation rates decrease as infiltration increases, providing greater availability of water for crop growth.

- No-tillage soils support a greater number of beneficial insects and a higher microbial population due to soils remaining mostly undisturbed and crop residue left behind. As in other ecosystems and ecological niches, these microbes and insects are often at the lower end of food webs which ultimately support a diversity of wildlife. Some crop residues and cover crops can also provide habitat for wildlife.
- No-tillage farming reduces erosion and runoff which protects the surrounding environment and reduces costs associated with nutrient application. No-tillage farming prevents the loss of valuable topsoils in which crops flourish.
- Because no-tillage often requires less equipment operation time, this translates into a reduction in labor and equipment costs. Growers also generally tend to see a reduction in fuel consumption and an increase in the longevity of equipment used due to the reduced usage. It should be noted that the actual reduction in fuel use does depend on such factors as size of equipment, the number of trips actually made across a crop and the soil type present.

Cons

- Special machinery such as a no-till drill may be required to till or drill into crop residue.
- Some conservation tillage practices are not successful in certain situations and soil types. It is very important to examine the various conservation tillage practices and know what practice works best in each situation.
- Depending on site-specific circumstances and costs, additional herbicides may be applied to a field in lieu of tilling weeds through conventional plowing techniques.
- Crop damage from disease outbreak and nuisance insects can be higher where conservation tillage practices are used.
- To provide the benefits listed above, crop residues left during no-tilling operations cannot be baled or heavily grazed by animals and provide the most benefit when left uniformly distributed across a field rather than in rows.
- Lastly, additional application of fertilizers like nitrogen may be necessary based on the condition of crop residue present.

No Till Drill Rental Information:

In 2000 the Hiwassee River Watershed Coalition, with the help of a grant from the North Carolina Clean Water Management Trust Fund, purchased a no-till drill to help reduce erosion from pastures in need of rehabilitation and from hay and cropland near streams. The drill is being made available to farmers in the Hiwassee River watershed for whom purchase of a drill is not economically feasible.

To rent the drill, simply call (828-837-6638) or stop by the Peachtree Farm and Home Supply which is located in the Peachtree Community of Murphy, NC behind the Citgo station and near the elementary school. More information, including rental agreement forms and those available to provide technical assistance locally, is found on the HRWC web site: <http://www.hrwc.net/notilldrill.htm>

Contact the following agencies for technical and/or cost share assistance with no tillage farming:

North Carolina

USDA Natural Resources Conservation Service
225 Valley River Ave., Ste. J
Murphy, NC 28906
(828) 837-6417 x3
glenn.carson@nc.usda.gov

Georgia

USDA Natural Resources Conservation Service
185 Welborn Street, Box 3
Blairsville, GA 30512
(706) 745-2794 x3
doug.towery@ga.usda.gov

The following web sites provide additional information about no-tillage farming:

Conservation Technology Information Center
<http://www.conservationinformation.org/>

North Carolina Natural Resources Conservation Service
Job Sheets for Individual Agricultural Practices
ftp://ftp-fc.sc.egov.usda.gov/NC/ECS/Job_Sheets/NC_Job_Sheets.htm

Vermont Natural Resources Conservation Service
Fact Sheets for Individual Conservation Practices
http://www.vt.nrcs.usda.gov/technical/Conservation_Practices/Index.html

Pennsylvania Nutrient Management Program Handbook
Better Soils With the No-Till System
http://panutrientmgmt.cas.psu.edu/em_publications.htm

North Carolina Department of Agriculture and Consumer Services. Project Green.
<http://www.p2pays.org/ref/07/06568/2001/nframe.asp?type=AGY&page=AGY-agcefs.htm>

North Carolina Department of Agriculture and Consumer Services-Agronomic Division
Soil Fertility Note 16: Gearing up for Conservation Tillage
<http://www.ncagr.gov/agronomi/pdffiles/sfn16.pdf>

No-Till Farmer Magazine
<http://www.lesspub.com/cgi-bin/site.pl?ntf/index>

North Carolina State University
Sustainable Practices for Vegetable Production in the South.
<http://www.ncsu.edu/sustainable/tillage/tillage.html>

<http://www.no--till.com/>