

## **Field Notes:**

**October 9, 2000**

### **Farming without plowing; is it really possible?**

By: Dr. Ernie Flint, Area Agent – Agronomy  
Mississippi State University Extension Service

Growing crops without working the soil is a fairly new concept for farmers in Central Mississippi. This idea is not really new since farmers in other parts of the nation have used “no-till” methods for many years. A detailed history of how these methods have evolved in American agriculture would be interesting, however it would probably require several hundred pages to completely cover the subject.

Early work with reduced tillage and no-till was done in several states, however researchers at the University of Tennessee are responsible in large degree for work that has led to increased acceptance of no-till in the southeast. In the early stages of no-till research, most of the work was done with corn and soybeans. The use of no-till methods in the production of cotton has lagged behind other crops mainly because of this crop’s high profit potential. Mississippi cotton farmers have remained highly skeptical about no-till because traditional methods for growing the crop have been successful for so many years.

Cotton farmers have resisted changing to no-till for many reasons; some of these are financial, sociological, and psychological. Agricultural lenders have been cautious about financing the planting of cotton in such a radically different way. Landowners who rented to cotton farmers and fathers whose sons considered no-till were hesitant, often making comments like “you can’t farm my land that way”, “no-till means no crop.” The psychological barrier was that farmers simply did not want to be the first to make such a radical change, having seen so many “experiments” attempted with poor or even disastrous results.

No-till cotton was grown in this area in the 1960’s, but technology was not ready for the system. Herbicides available at the time did not provide good weed control without mechanical cultivation. Incentives for converting to this system were not strong enough then to entice farmers to try no-till. In contrast, current economic conditions in agriculture have provided a reason for change. As has been the case throughout history, necessity has brought innovation.

Since 1990, several local farmers have experimented with no-till with varying degrees of success. During this period, they answered the big question that all farmers had, “can I really grow cotton without tillage?” These “experimental” fields produced as well as those that were plowed in most cases, however the “tools” for making the system work really well were still not available. By this time a lot of research was in progress throughout the Cotton Belt to develop methods to make no-till cotton work better.

When Roundup Ready (RR) cotton was introduced, farmers and researchers recognized that this could be the final piece of the “puzzle” making large scale no-till cotton practical. Although RR has had its own problems, farmers have learned to make it work. Weeds can be managed in no-till cotton without Roundup, but this technology has given farmers the confidence to make the change.

No-till has many advantages, and of course some disadvantages. The big advantage is that it virtually stops soil erosion and helps keep surface waters clean. No-till allows organic matter to increase in soil rather than being depleted as with intensive tillage. When organic matter builds, several other very beneficial things happen; moisture holding capacity of the soil increases, nutrients are held in the organic matter and “fed” to roots as needed, and the soil resists compaction. Cotton and other crops respond well to this “natural” soil environment.

Other no-till benefits include the fact that moisture is not lost during field preparation. Machinery use is dramatically reduced, plus the untilled soil is better able to support equipment. Since rows stay in the same place, heavy implements only pack a few middles, allowing the rows to remain soft and ideal for the development of roots. Weed seeds are not covered with soil as they are in tilled fields, allowing them to be destroyed during the winter months. Beneficial soil organisms, including fungi, bacteria, worms, and insects inhabit undisturbed soils quickly, opening pathways for air and water, actually providing natural and cost-free mixing of the soil.

No-till farming requires much less labor, machinery, fuel, maintenance, and time. Farmers using no-till practices find themselves with more time for other things like family and recreation. No-till is inherently good for the environment, both directly and indirectly. Not in the history of agriculture have we come across something that fits so well, plus crops yield as well if not better than with tillage. The system is especially beneficial during dry years since it is the best way to conserve critical moisture. It is also helpful in wet years since fewer operations are required and the undisturbed soil supports equipment better.

Everything is not perfect in no-till. Some soils have natural layers called "fragipans" that can limit root penetration; these soils may require deep tillage every 3 to 5 years to keep this layer open. Implements have been developed to do this with very little surface disturbance. Deep-rooted weeds like redvine, trumpet creeper, horsenettle, geranium, and primrose have an advantage in no-till, and special precautions must be taken in fields where these weeds are found. Row patterns cannot be changed in no-till since this would require completely reworking the soil. These problems can be solved or avoided with good planning.

Farmers I work with have learned that no-till is one of my favorite subjects. When it is done right, it can allow profits to be made even during hard times like the present. I fully expect that if large-scale row crop agriculture remains no-till will be a vital part of it. It is especially important for hill areas because of the soil conservation aspect, but it works equally well on flat land like the Delta. I estimate that over 60 percent of the crops grown in this area in 2000 utilized some form of reduced tillage but only around 10 percent were truly no-till. Yields from no-till fields are some of the best this year, and I expect the adoption of no-till to be much greater in 2001.