

TABLE 18.1. The challenges associated with conventional tillage and no-till, according to Georgia farmer Bob Rawlins

| <b>CHALLENGES WITH CONVENTIONAL TILLAGE</b>   |
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| The soil is leaving the farm via erosion.   |
| Gullies and rills from erosion increase the wear and tear on equipment.   |
| During rainstorms in the growing season, soil may splash onto the crops, increasing disease.  |
| During spring winds, wind erosion damages watermelons through sandblasting and by whipping on the young, tender seedlings.  |
| On bare soil, watermelon stems have nothing to anchor onto and flop more in the wind, incurring more damage.  |
| Soils dry out more quickly following rainfall events, and plants show stress quicker during periods of drought.   |
| Soils crust and water runs off and does not infiltrate into the soil. Water puddles on the surface.   |
| Equipment costs are greater because more equipment is required for multiple passes over the field. This also requires more fuel, labor and maintenance.   |
| A lot of time in the field is spent harrowing and plowing. Thus, there are lost opportunities for additional agricultural enterprises with the same labor force.  |
| There is a bigger reliance on seasonal labor.   |
| <b>CHALLENGES WITH NO-TILL</b>  |
| Weeds are a different problem because the option to cultivate is removed.   |
| During the first few years of no-till, there is a yield lag in peanuts. The crusty, cloddy soil thwarts peanut germination until increases in organic matter have improved the soil tilth.  |
| Recreational plowing (or plowing when it is not needed) is eliminated.  |
| The field surface may be rougher and can slow down sprayer operations.  |
| Variable residue depth creates seed placement problems. Residue must be uniformly distributed.  |
| Different crops leave different types and amounts of residue, which necessitates adjustments in residue management. Cotton residue in the spring is more woody and sparse than corn.  |
| No-till grain drills are more expensive than conventional grain drills.   |
| If a cover crop is used in the winter, it must be watched in the spring to make sure it does not get out of hand. That is, it could deplete soil moisture or attain so much mass that available equipment will not be able to plant into the residue. |
| If a cover crop is used, it is difficult to find roller/crimper equipment in the market.  |
| With no-till, one must consciously decide to go to the field to monitor plant health. In contrast, with conventional tillage, one is out in the field more often and can incidentally assess plant health.  |

**TABLE 18.2.** Supporting technologies and practices used by case study farms

| <b>Supporting and specialized technology or practice</b> | <b>Producer(s) using the technology</b>        |
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| Cover crops  | Davis, Brock, Rawlins, Harris, Dargan, Winslow |
| Roller/crimper   | Davis, Brock, Rawlins                          |
| Grid sampling and variable rate application of nutrients | Dargan   |
| Variable rate (precision) irrigation                     | Dargan, Triple J Farm                          |
| Green Seeker technology                                  | Davis  |
| Sod-based rotation                                       | Harris   |
| Compost extract  | Winslow  |
| No-till specialty crops                                  | Davis, Rawlins                                 |
| Auto steer or other GPS applications                     | Brock, Triple J Farm, Dargan                   |
| Organic production                                       | Winslow  |