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THE GREAT TILLAGE DEBATE:

AN HONEST DISCUSSION OF CONVENTIONAL TILLAGE FOOD PLOTS

Should food plotters use conventional tillage or reduced tillage methods? Many considerations factor into that decision, and answers aren't always clear.

My previous career in agricultural research began in 1984 in southern Georgia, where the major cropping systems are peanut, cotton and many vegetable crops grown for fresh-market. When I arrived, those crops were largely grown using what I call conventional tillage. Conventional tillage used several tillage operations throughout the growing season and was grouped into two broad categories: primary tillage and secondary tillage. Nothing was standardized with tillage sequences, and implements varied among farming operations. Conventional tillage systems produced economically sustainable crops for decades.

Beginning in the late-1980s, things began to change. Fuel prices began to increase, along with the cost of most crop production inputs, such as fertilizer, pesticides and seed. Changes in agricultural and trade policy caused wide fluctuations in prices received for raw commodities. Additionally, there were fewer skilled farm workers available. Collectively, those factors radically transformed how the major crops in my region were grown. Most of the crops are now grown using some form of reduced tillage, in which there are significantly fewer tillage operations compared to conventional tillage systems. With the adoption of precision guidance technology, crops are now established with minimal seedbed disturbance and seeded through debris from the previous crop using highly specialized planters. By specialized, I'm referring to planters with an array of cutters and furrow openers designed to slice through plant material from the previous crop and place precisely spaced seed into the soil. Necessity fueled radical changes in how these crops were grown on a commercial scale. Although this example describes what happened where I live in the southeastern United States, similar changes have occurred throughout the country in other crops.

As a career agricultural scientist, I have always approached food plot management as a specialized form of agriculture. Does the radical transformation in commercial agriculture I described need to occur in how food plots are managed? That broad topic is subject to considerable debate, and it does not take long to find those discussions on social media, along with a legion of experts who readily offer their opinions. That leads to the fundamental question: Which is better for food plots: conventional tillage or reduced tillage?

In the context of food plots, there is not a universally correct answer or a wrong answer.

CONVENTIONAL TILLAGE IMPLEMENTS

The entire food plot tillage discussion is anchored by two extremes with infinite variations between them. For my part of this discussion, conventional tillage food plot production is the use of soil tillage implements to mechanically loosen compacted soil, mix soil amendments (fertilizers and limestone), weaken perennial weeds, and create a seedbed suitable for establishment of small-seed forage crops. The most common food plot tillage implement used in conventional tillage is a disk harrow. Disk harrows vary in size. Harrow blade diameter and spacing are the important variables for harrows, not overall width of the implement. Disk harrows with smaller and closely spaced blades can pulverize the soil and create an ideal seedbed for small seed forage establishment. Depending on food plot acreage, the horsepower sources are tractors or a UTV/ATV.

Tillage to loosen compacted soil: Tillage loosens packed soil and breaks apart large clods, which lets oxygen and moisture penetrate into the soil. This is necessary when newly cleared sites are being prepared for food plots or when soil is heavily compacted from previous use. Loosened soil also helps create optimum conditions for germinating crop seeds, which will be discussed later in this article.

Like many things in life, too much of a good thing can be detrimental. Excessive tillage with a disk harrow can create a compacted soil, especially if wet soil is repeatedly tilled. Think about how roads are constructed. A crucial step in road construction is a cyclic pattern of watering and harrowing, repeated many times. This intentionally compacts the roadbed, making an ideal substrate for the road. In food plots, the same processes can unintentionally create a compacted soil that will hinder food plot growth.

Tillage to distribute soil amendments: A distinct advantage of conventional tillage food plots is the ability to mix immobile soil amendments with the soil. Some essential plant elements are immobile and need to be uniformly mixed with the soil to maximize benefits to the crop. Phosphorous is an essential element that's essentially immobile in the soil. In food plot soils with a phosphorous deficiency, the fertilizer needs to be mixed with the soil for optimum performance, and a disk harrow is the tool of choice. This is also the case with acidic soils being treated with limestone. The most common liming materials are carbonates (that is, limestone), which are fairly immobile in the soil. Tillage with a disk harrow mixes limestone with the soil for optimum buffering of acidic soil, improves crop response, and maximizes overall benefits of this input.

Tillage to weaken perennial weeds: Perennial weeds are the bane of food plotters. Successful perennial weed control in food plots is based on using the systemic herbicide glyphosate before planting when the site is fallow (no crop growing). It's a well-established practice when controlling troublesome perennial weeds to combine fallow tillage with a later application of glyphosate. Tillage will weaken the perennial weeds and improve performance of glyphosate when applied to weed regrowth. For perennial weeds, this strategy is fundamental for successful weed control because of the limited number of selective broadleaf herbicides available for use in food plots. In this case, the weed control value of correctly used tillage is substantial.

Tillage to prepare seedbeds: Conventional tillage food plot systems provide opportunities to create ideal seedbeds, and this is probably the most important advantage of conventional tillage systems in food plots. For small-seed forages, it's fundamentally important to have direct contact between the forage seed and soil particles to ensure an optimum crop stand. Direct contact between forage seed and soil particles allows the seed to readily absorb moisture and germinate, and later, seedlings emerge. Seed-plant debris contact is undesirable. Poor seed-soil contact will form air pockets around the seed, resulting in delayed or erratic germination, followed by the curse of food plotters — a poor forage stand. From that point forward, a poor forage stand creates a domino effect of uncorrectable problems that usually culminate in food plot failure — a costly disaster.

Why is good seed-soil contact the most important advantage of conventional tillage food plots? My mentor from my previous research career was an old-school agronomist, Frank McGill. Although he was a knowledgeable and instinctive agronomist, McGill was also an exceptional communicator. Using his uniquely succinct delivery, he once told a group of farmers, "Yield potential is established the moment a crop seed is placed in the soil." Think about that for a minute. If planting conditions are marginal because of extremes in soil moisture, cool temperatures or slipshod seedbed preparation, the crop yield potential will be reduced with no chance to recover compared to ideal conditions. Although food plots are largely a discretionary hobby to support another hobby (hunting), we want a production system that maximizes food plot productivity with minimal risk of failure. Achieving that begins with crop seeds that are surrounded by and directly in contact with soil particles, which is much easier to achieve in conventional tillage systems compared to reduced tillage systems.

CONCLUSION

Tillage is a useful tool in food plot management when strategically used. Careless tillage does more harm than good. The rhetorical question remains: Do the benefits of conventional tillage food plot systems offset the risks? That question is impossible to correctly answer for all food plot systems. As I see it, new food plot sites or inexperienced food plotters would be better served to initially use conventional tillage to correct site-specific crop production hazards (such as nutrient deficiencies, acidic soils and perennial weed infestations) and also gain experience in successfully growing small-seed forage crops. Later, they can systematically introduce elements of a reduced tillage system into their overall food plot management plan. Both tillage systems have merits. Both have drawbacks.