Sustainable farming improves local economies. Soil health has a direct impact on Main Street because farmers practicing these principles will not travel far in search of supplies. They are using livestock and therefore need fencing and feed from the local co-op or farm store. The profit potential of soil health creates more family farms, resulting in more families doing business in the grocery store, more children in the schools, and more community building. Soil health and its accompanying shift back toward family-scale farming puts agriculture into the hands of the community rather than large corporate operations.

Many people who have undergone the soil health paradigm shift in their operations market locally and provide nutritious, high-quality and high-demand products to the community: grass-fed beef, pasture-raised chickens and hogs, specialty crops, organic produce, etc.
Change Takes Time

Farming with a focus on soil health is a paradigm shift for most producers. Paradigm shifts take time; in agriculture, it takes about 20-40 years – basically a generation. In 1900, it was believed that rubber tires on farm equipment poisoned the ground; by the 1930s, most equipment had rubber tires. Although tractors had been around for almost 50 years, the International Harvester equipment catalog for 1949 still had horse-drawn equipment. Hybrid seed and glyphosate-resistant crops existed for decades before they were fully embraced by the majority of farmers.

Educational events in rural communities bring in the numbers that impress funders, but it’s often the one-on-one work that moves farmers ahead. One-on-one work with farmers at first glance seems expensive and time consuming. However, for every producer we can move ahead on adopting the practices and principles of soil health, more in the community tend to follow. Many producers decide what they will do based on what other farmers are doing. The more champions for a specific set of practices that we can “plant” on the landscape, the more likely others in that community will adopt those practices. It’s a bit like being a Johnny Appleseed. However, in addition to planting the seed through workshops, conferences and field days, we need to care for the seedlings to ensure they get a good start. When they are thriving, others tend to follow. Time spent one-on-one with farmers is often time well-spent, and eventually has a positive impact on Main Street.

Broken Production Model

There is a theme in commodity agriculture that farmers are both unwilling and can ill afford to change practices without a substantial subsidy. This way of thinking permeates modern agriculture: bribe producers to bandage a broken production model to achieve results that benefit society. Typically, this pattern has been connected to practices such as terraces, grassed waterways or CRP where a farmer is paid to take land “out of production.” Now, public discussion has suggested subsidies are essential to adoption of some soil health practices, such as cover crop integration, into the commodity corn and soybean model.

If cover crops are considered the key tool to make the corn and soybean model more environmentally friendly, some may view their integration as something producers cannot “afford” without financial assistance – and to maintain the current model we must bribe farmers to change. But the corn and soybean production model in itself has not been “affordable” over the past three years due to low commodity prices, and there is no guarantee that prices will improve. Some have noted there will never be enough money to affect large-scale change. Plus, many in commodity agriculture incorrectly view the addition of cover crops to the corn and soybean model as the endgame for soil health.

However, when cover crops are used as tool in concert with minimizing tillage, diversifying the crop rotation and integrating livestock through managed grazing to move toward soil health, there are NUMEROUS examples of producers demonstrating profitability – most without subsidies. Implementing practices such as cover crops are not only affordable, but profitable, if placed in the context of soil health. Across the country we are seeing well-managed integrated crop and livestock operations that are
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consistently profitable; SFA has highlighted some of these producers at our annual Midwest Soil Health Summit.

Farm profitability encourages many things, but most important is the impact it can have on Main Street. Profitable, sustainable farms create legacies that attract future generations and keep them on the farm. Profitable, sustainable farms have money to spend in the cafe, at the seed dealer, and at the car dealership. Profitable, sustainable farms provide jobs and support for the public schools and set positive examples that rural community life can be rewarding and fulfilling.

Cover Crops

Any technical discussion of true soil health should start with cover crops – a “tool” that can provide substantial benefits to improving soil health, productivity and farm profitability. They are not a “silver bullet” but work best in combination with diverse crop rotations, no-till, and livestock integrated into the cropping enterprise through planned grazing.

Complex cover crop blends, or “biological primers,” typically consist of eight or more plant species in the mix. Biological primers have demonstrated their effectiveness in jump-starting the biological systems in many soil types and farm applications. The more diverse the complex cover crop mix, the better the response from soil microbes and the higher level of drought tolerance.

Biological primers are customized to meet the needs and goals of a particular field and farm operation. Previous crop history and future cropping plans for a particular field are essential in determining a specific cover crop blend. A sound crop rotation must include representatives from each of the four major crop types: cool-season grasses, cool-season broadleaves, warm-season grasses and warm-season broadleaves (see table below for examples).

Soil health equals soil function

Soil function is the ability of the soil to capture and store water, and the ability to cycle nutrients. Most soil function (90 percent) is mediated by soil micro-organism activity that builds soil aggregate structure. Our role as producers is to create a home or habitat that promotes robust soil microbe communities. This is accomplished by addressing the following principles:

1) Keep a living root in the soil.

The soil/root interface is an important location for soil microbial activity. Without a living root in the soil we greatly reduce microbial activity. Minimize how much of the year a particular plot or bed does not have something growing in it. Companion plantings, succession plantings and cover crops can be useful.

Cover crops can be a powerful tool to aid in improving soil health. Cover crops work best in concert with the tenants of soil health. Cover crops may be annuals, biennials or perennials. Cover crops managed like a cash crop will provide the greatest soil health benefits. Complex cover crop blends contain eight or more species and at least one grass, one legume and one brassica.

2) Keep the soil covered.

Avoid bare soil. Living plants and mulch provide a buffer to weather extremes. Soil microbes don’t like it too hot or cold. Cover crops or mulches create a comfortable home for the microbes when a plot or bed is not producing a cash crop. Providing adequate pasture rest and avoiding overgrazing minimizes bare spots and keeps the soil shaded. Keeping the soil covered also helps minimize erosion, suppresses weeds, minimizes nutrient loss, and aids in retaining moisture.

3) Diverse crop rotations.

Many vegetable producers grow a wide variety of produce and find a diverse crop rotation the most readily adaptable soil health principle. However, some producers focus on only a few products (e.g. pumpkins or sweet corn) or have pasture dominated by only a few plant species (e.g. Kentucky bluegrass). In addition to breaking disease and pest cycles, diverse crop rotations can stimulate a

**EXAMPLES OF MAJOR CROP TYPES**

**Cool-season grasses:** Oats • Barley • Wheat • Annual rye • Cereal rye • Triticale

**Cool-season broadleaves:** Field pea • Red clover • Hairy vetch • Common vetch • Turnip • Daikon radish

**Warm-season grasses:** Sorghum-sudan • Millets • Corn

**Warm-season broadleaves:** Soybean • Cowpea • Sunflower • Buckwheat
wide variety of soil microbes. Research has documented increased pasture diversity stimulates future forage production. Many soil microbes are associated with specific plant species. The four major crop types are listed below. Try to utilize at least one representative from each of the major crop types in a rotation. Succession plantings and cover crops can be useful.

4) Minimize tillage.

Tillage is the traditional tool for weed control and preparing seed beds. Mulches and a diverse rotation that include perennials can aid in reducing tillage. Tillage promotes the type of bacterial activity that has a negative impact on soil health by accelerating decomposition of soil organic matter (SOM). SOM is the food source for much of the soil biological activity necessary for increasing soil health.

Examples: Building one or more years of a perennial cover crop such as red or white clover that can be plowed down as a “green manure” for a subsequent crop can be a means of reducing tillage. Directly planting pumpkins into a cereal rye scythed as a mulch can also minimize tillage for weed control.

5) Integrate livestock.

All natural ecosystems have associated animal communities. Often, livestock are the primary missing link in soil health. Livestock integration can be as simple as regular utilization of composted livestock manures. However, there are additional benefits from direct integration of livestock including hoof action, insect consumption, glean following harvest, and direct application of manure where feasible.

Conclusion

Small businesses such as seed dealers, fence and hardware retailers, and others have helped move this paradigm shift, but SFA needs to partner with more businesses on Main Street to recognize the potential soil health holds. Working together, we can ensure both new and veteran farmers in these communities have the tools and knowledge they need to build soil health and achieve its wide-reaching benefits.

In so doing, SFA will help Main Street businesses become more open to creating markets for the food and fiber products that are locally grown using soil health principles. That may mean paying more for locally produced food than what you could get from Walmart, Amazon or a big-box retailer, but stewardship costs will come either in cleanup or up front. SFA believes the up-front cost of local food is better for communities, the environment, and future generations; and we believe soil health is the key.