

## The Case for Cover Crops

By Phil Brink, CEP

The lowly cover crop has been getting a lot of attention lately. Once largely relegated to the domain of organic farmers, cover crops are becoming more mainstream thanks in part to a concerted USDA-NRCS focus on soil health, as well as interest among producers in reducing production costs.

Cover crops sport many potential benefits, from increased water holding capacity to improved soil fertility and better crop yields. Cover crops provide a growing root system combined with leaf cover at the surface, both of which help combat soil erosion, particularly if the field also has surface residue from previous crops. Deep-rooted cover crops can break through hard pan by extending roots down three feet or more in a single crop year, eliminating the need for chiseling. Nitrogen fixing cover crops such as Austrian peas, alfalfa, beans, clover and other legumes accomplish this while adding nitrogen to the soil for the next crop.

Conversely, some cover crops can reduce excessive nitrogen levels in the soil. Fertilizer is sometimes applied in the spring before irrigation water availability is fully known. In years where rainfall and irrigation water supplies end up being limited, this can lead to diminished yields and significant nutrient carryover in the soil. Besides being a financial hardship, this situation also creates a regulatory compliance challenge for Concentrated Animal Feeding Operations (CAFOs), which are required to balance nutrient applications in waste with crop uptake. In situations like this, non-legume winter cover crops such as annual rye can be used to scavenge excess nitrogen, phosphorus and other soil nutrients. The cover crop is then harvested via livestock grazing or mechanical means.



Interest in cover crops is increasing in part because of the continually rising cost of conventional crop production. Cover crops offer a way to reduce costs by increasing soil carbon and nitrogen levels while suppressing weeds and disease-causing organisms, resulting in lower fertilizer and pesticide use. Reducing chemical usage has been found to have other benefits besides just financial - namely, the return of beneficial organisms such as earthworms, which enrich and aerate the soil.

Cover crops build soil organic matter. Studies have found that soils with higher organic matter levels do a better job of buffering potential pollutants before percolating water reaches groundwater. The minerals and microbes in soil filter, degrade, immobilize, and detoxify organic and inorganic materials, including industrial and municipal by-products and pesticides. The higher the soil organic matter level, the greater the buffering capacity.

Water availability is another factor driving cover crop interest, as drought has pummeled different parts of the U.S. over the past decade. One long-standing concern with cover crops is that they deplete soil

moisture, robbing the following crop of moisture and impacting yield. A two-year study conducted by USDA-Agricultural Research Service at Akron, Colorado and Sydney, Nebraska on dryland and lightly-irrigated fields found that cover crops ahead of wheat did indeed reduce soil moisture at planting. Wheat yields in the study were reduced by an average of 5.9 bushels per acre. Nitrate concentrations in the soil were also reduced by the cover crops. On the other hand, microbiological populations were significantly increased in the cover crop fields. In studies conducted in more humid climates, soil moisture depletions caused by cover crops were largely offset by beneficial effects including increased snow trapping, reduced runoff and evaporative losses from the surface, and increased water holding capacity.

Planting and managing a cover crop carries an associated cost. Producers want to first know if the benefit outweighs the extra time and money required. And which cover crop mix is best? Planting the cover crop must normally be timed with the cash crop harvest. Aerial seeding or the use of specialized high clearance planting equipment enables seeding of the cover crop into a growing cash crop prior to harvest. This technique adds cost but enables the cover crop to become well established before the onset of winter.

The benefits of using cover crops accrue over time, and may or may not be apparent in the first year. Growers must tailor their cover crop regime to complement their individual management methods and interests. This requires some trial and error. Planting a mixture of crop mixture rather than a single species may increase chances of success since at least one or two species are likely to thrive even under less than ideal conditions. In Colorado, common cover crops include Austrian peas, rye, triticale, wheat, hairy vetch, lentils, crimson clover, red clover, flax, radishes, canola, turnips and oats.

Cover crops improve soil texture, fertility and drought tolerance. They can also protect water quality both by reducing surface erosion and by neutralizing pollutants moving downward through the soil profile. While not everyone reports increased profits from cover crops, the majority of growers who have tried them report positive results. Now is the time to plan for a winter cover crop. Most growers plant a few acres the first year and expand as they develop a better understanding of the plant mixes and management methods that best fit their operation. The USDA-NRCS Environmental Quality Incentives Program (EQIP) can provide cost-share funding for eligible cover crops.

*Phil Brink, CEP, is the owner of BRINK, Inc., which provides environmental compliance assistance, including Nutrient Management Plans to the agricultural industry. He may be reached at 720-887-9944, or [phil@brinkinc.biz](mailto:phil@brinkinc.biz).*