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Northeast Missouri
Ag Connection

Your local link to MU for ag extension and research information
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Benefits and Options of Cover Crops in Missouri

As harvest season approaches in Missouri, utilizing cover crops in harvested fields is an option for achieving multiple benefits, including:

- Lessening soil erosion
- Reducing fertilizer cost by planting legumes
- Improving crop productivity by enhancing soil health
- Increasing net farm income
- Reducing soil compaction
- Conserving soil moisture and lessening soil drying
- Reducing herbicide and other pesticide cost (fungicide and insecticide)

Benefits from cover crops are typically longer-term rather than shorter-term. Adding plant residues into the soil and improving organic matter adds biodiversity to the cropping system. Also, cover crops provide food for the soil microorganisms in the soil. This may also help to increase microbial biomass, diversity and balance in the soil leading to less disease in corn and soybean. Diverse microorganisms improve the health of the soil and cropping system.

There are different species of cover crops available for planting in Missouri. The most common cover crops in Missouri are cool-season including grasses, legumes, small grains and brassicas. There are various factors, which affect selection of cover crop species: season, purpose, soil type and weather. Cool-season plants grow better in fall and spring, while warm-season plants perform better in summer. Winter annuals grow better in winter.

Planting grass species on highly sloping land will help reduce erosion. Legume cover crops such as clovers and vetch fix atmospheric nitrogen, which reduces the amount of nitrogen fertilizer needed for the next field crop. Well-adapted annual legume cover crops in Missouri include crimson clover and hairy vetch, with seeding rates of approximately 15 pounds per acre if drilling and 20 pounds per acre if broadcasting.

Cereal rye, a small grain, is the most popular cover crop in Missouri, which is cold hardy and can be planted later, than other cover crops. It provides excellent erosion control and has very good growth in spring. The recommended seeding rate for cereal rye is 70 to 80 pounds per acre for drilling and 100 to 120 pounds per acre for broadcasting. Triticale, wheat and oats are other small grain species used as cover crops in Missouri.

Oilseed radishes and forage turnips, brassica species, are also cover crops used in Missouri. The recommended seeding rates are to drill 5 to 6 pounds per acre or broadcast 8 to 10 pounds per acre.

In general, before soybean, use either cereal rye or mix of oilseed radishes and oats. Before corn, use a mix of oats and crimson clover, or a mix of triticale and crimson clover.

For more information about cover crops, see University of Missouri publication G4161 titled “Cover Crops in Missouri: Putting Them to Work on Your Farm”. It is available online at http://extension.missouri.edu/p/G4161.

University of Missouri Strip Trial program has initiated on-farm trials. The trial compares three treatments: cereal rye as a cover crop, wheat as a cover crop and no cover crop. For more information about participating in University of Missouri Strip Trials, contact your extension agronomist or visit http://striptrial.missouri.edu/

Source: *Dhruba Dhakal, agronomy specialist*

September Gardening Tips

Ornamentals

- Plant trees and shrubs now. The warm days and cool nights of fall make it an ideal planting time, giving plants enough time to establish root systems before cold weather.
- Take cuttings of annuals to have vigorous plants for over-wintering. Annuals can be rooted in water or in a soilless potting mix.
- Plant spring bulbs except for tulips as soon as they are available. Keep tulips in a cool, dark place and plant in late October. Plant all bulbs before the ground freezes.
- Divide perennials, especially spring blooming plants. Enrich the soil with peat moss or compost before replanting. Avoid planting peonies too deep.
- Dig up gladiolus when their leaves turn yellow.
- Begin forcing poinsettias to bloom at the end of the month. Place plants in a cool, dark room or closet from 5 p.m. until 8 a.m. for about 8 weeks or until top leaves turn red.

Vegetables

- Sowing seeds of radish, lettuce, spinach, and other greens in a cold frame will prolong fall harvests.
- Pinch out the top of Brussels sprout plants to plump out the developing sprouts.
- Keep broccoli picked regularly to encourage additional production of side shoots.

Fruit

- Prop up branches of fruit trees that are threatening to break uPick pears before they are fully mature. Store in a cool, dark basement to ripen.
- Discard any spoiled or fallen fruits, which can harbor fungal disease and become a problem the next year.
- Paw paws ripen in the woods. Raccoons and wildlife enjoy these fruits, so check trees often for ripe fruit.
- Check along peach tree trunks to just below the soil line for gummy masses caused by borers. Probe holes with thin wire to puncture borers. Sprays can be used if necessary.nder the weight of a heavy crop. Early apple varieties will ripen this month.
- Blackberries are ripening during the first week of August. Do not delay picking. Ripe berries attract the Spotted Wing Drosophila that lay eggs in the berries which then quickly hatch into larvae and feed on the berries.
- Spray peach and other stone fruit tree trunks now to protect against peach tree borers. Borers can kill trees over time.
- Cultivate strawberries. Weed preventers can be applied immediately after fertilizing.
- Watch for fall webworm activity now. Remove webs from trees if practical.

Turfgrass

- Begin fall seeding or sodding of cool season grasses. Seedbeds should be raked, de-thatched, core-aerified, fertilized, and seeded. Keep newly planted lawn areas moist, but not wet.
- If soils become dry, established lawns should be watered thoroughly to a depth of 4-6 inches.
- Cool season lawns are best fertilized in fall. Make up to 3 applications between now and December. Do not exceed rates recommended by fertilizer manufacturers.
- Newly seeded lawns should not be cut until they are at least 2-3 inches tall.

Miscellaneous

- Fall is a good time to add manure, compost, or leaf mold to garden soils for increasing organic matter content.
- Monitor plants for spider mite activity. Due to the hot, dry weather this summer, they have been bad on some plants, including tomatoes. Reduce numbers by hosing off with a forceful spray of water.
- Seasonal loss of inner needles on conifers is normal at this time. It may be especially noticeable on pines.

Source: *Jennifer Schutter, horticulture specialist*

Deciding to Sell or Store Grain at Harvest

As harvest nears, producers will have to decide whether to sell or store grain. Most, who decide to store, do so with the expectation of higher prices after harvest. Another reason producers decide to store, is tax management. Postponing grain sales for income tax reasons is a practical business consideration, but some strategic marketing opportunities may be lost. Grain storage may capture higher prices in one or more of the following ways:

- higher cash prices resulting from higher futures prices,
- higher cash price in relation to futures price due to improving (strengthening or narrowing) basis; or
- capturing the market carry (premium offered by distant month futures)

Grain prices are *"discovered"* in the futures market through price action resulting from world -wide supply and demand. Local cash prices are determined in part by the futures contract month nearest the delivery date of the grain. Selling cash grain and re-owning with futures or call options avoids many of the risks and costs associated with storing cash grain (grain quality, storage and handling costs, insurance and interest). These reduced storage risks may offset many of the concerns of using the futures market (margin calls and option premiums). Since price risk/rewards are the same regardless of whether cash grain or paper is held, this leaves only two marketing reasons for storing grain--capturing basis gain and market carry.

The spread between the futures price and the local cash bid is basis. Basis represents the local market's price adjustment for transportation, local supply and demand. Basis is usually weakest (widest) at harvest time and often narrows after harvest. This recovery can provide a significant improvement in cash price even if the futures price does not increase and can only be captured by making cash sales. Once this basis recovery occurs, there is often little left to be gained in the cash market by continuing to store.

Market carry is the premium distant month futures contracts

offer to store or "carry" the grain for later sales. Forward contracting, selling futures, buying put options or speculating on stored grain can capture market carry. The grain must be stored. Current costs in northeast MO for commercial corn and soybean storage range from $.15-.30 per bu. per month for September- December, with monthly costs after that time-period predominantly being $.04-.05 per bushel per month until the next harvest season.

Selling at harvest and re-owning with futures or options cannot capture market carry, since by paying the premium for a distant month futures contract in effect "pays someone else to store." Hedging (selling futures) allows locking-in the market carry, but gives up speculation on higher prices. Forward cash contracting the grain also locks -in the market carry, but gives up speculation on higher prices and basis gains. Buying a put option may lock-in a portion of the market carry and still allow speculation on higher prices, but the option cost may offset the advantages. A speculator is a market participant who tries to profit from buying and selling futures and option contracts by anticipating future price movements. Speculators assume market price risk and add liquidity and capital to the futures markets. They do not hold equal and opposite cash market risks. It is because of this risk level difference between speculators and hedgers that they receive different tax treatment by the IRS.

Speculating on capturing basis gains and market carry may offer the best opportunity to get a return on storage and can only be accomplished by holding on to the cash grain. Capturing basis gains can often be accomplished by mid to late winter--sometimes earlier. Continuing to store grain after basis gains can be very risky. At this point, some market carry can usually be captured. A useful tool to help determine whether to sell or store grain can be found at https://www.fapri.missouri.edu/software-download/ *Go to the last link on the page.*

So, as harvest nears, review your marketing plan. Understand your storage capacity – on-farm and commercial. Check with your elevator on their specific storage costs. Make adjustments to your plan and execute.

Source: *Darla Campbell, agriculture business specialist*

Turfgrass Soil Health: What it is and Why it is Important

Civilization, as we know it, has only been around 6,000 years. Plants have been around for 700 million years and fungi around 1,300 million. They have flourished, adapted and survived long before our intervention. It is clear that Food Web (Image 1) interactions and ecosystem diversity is a measure of soil health that have contributed to this survival mechanism. Management systems that support microbial life such as decomposers (bacteria, fungi and microarthropods) are responsible for nutrient retention in the soil. The interactions of decomposers with predator groups (protozoa, nematodes and certain arthropods) create nutrient cycling and retention in the ecosystem. Advances in technology are improving our understanding of microbial life and various biological functions, which are vital for overall soil health.

Practices associated with production agriculture are similar to the management of sports turf, golf, and home lawns etc., which attempt to mitigate or eradicate problem areas such as insects or diseases. However, those practices can reduce the overall health of the turf ecosystem. As, local, regional, state, and federal regulations are continually evaluating the environmental effects of applying chemical pesticides and fertilizers, best management practices which help sustain good soil health should be considered. Providing a beneficial management decision for plant growth in conjunction with a good environment for microbial activity needs more attention. While there is no one formula and no one solution, our management decisions must continually scrutinize the potential impact on overall soil health. However, soil health is relatively new to agriculture and the turf industry. The challenge is in testing and adjusting different methods onsite to establish site-specific programs.
Management Considerations

Nutrient-based upon soil test – not too much or too little. Turf needs fertility but that only makes up 5% of their diet (digested from both organic and mineral sources) while the other 95% comes from carbon and oxygen in the form of carbon dioxide and hydrogen from water. The organic source is a byproduct of the soil microorganisms which first digest and transform these nutrients into the available form. Plants respond to both excessive and deficient nutrient levels. While they are unable to distinguish the nutrients from biologically released organic source and our chemical soluble source, looking at a balance between the two would reduce the feast to famine scenario of a “spoon feeding” operation. Higher cation exchange capacity due to formation and presence of stable organic humus may promote greater numbers of soil microorganisms that regulate the availability of nutrient.

pH- acidity can effect turf nutrient uptake and growth as well as potential infestations by weed species. Microbes tend to grow best in upper pH range of 6.5-8.0. Optimal pH will improve the rate of mineralization of nutrient.

Water- too little or too much creates stress. Moisture is essential for microbe survival. If too high, aeration will be limited and most microbial activity reduced. Various forms of organic matter can hold many times their own weight in water, which can retain more dissolved nutrients that would otherwise be leaching out of the root zone.

Aeration- is essential for all aerobic microorganisms and those involved in nitrogen mineralization. Thatch management – heavy thatch keeps soil too moist, reduces air movement and promotes both insects and disease. Aeration reduces compaction from both foot and vehicle, which allows moisture, fertility, and oxygen through the root zone.

Cut height- management practices that include increased cutting height can reduced herbicide and fungicide applications as the greens are not as stressed, compared with cutting at lower heights.

Beneficial insects- healthy turf contains beneficial insects such as ground beetles, predatory and parasitic wasps, non-pest ants. Some prey upon harmful species or aid in recycling nutrients in soil as primary decomposers. Unnecessary pesticides reduce beneficial insects.

Pests- Pest create damage causing many human concerns. They can range from chiggers and ticks to raccoons in garbage cans or deer trails across the course. Treating the pest symptom may resolve the current visible issue but further investigation might lead to discovery of an imbalance in the ecosystem. Pesticide side effects can create an imbalance in the beneficial rhizosphere microbial pool. While plants are not defenseless, healthy plants in conjunction with soil organisms are able to withstand greater pest pressures.

Source: *Todd Lorenz, agronomy specialist*