

COLONIAL

NEWSLETTER



SWCD

Winter } 2024



**SERVING:**

The City of Williamsburg  
Charles City County  
James City County

York County  
New Kent County

[www.colonialswcd.org](http://www.colonialswcd.org)

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## Upcoming Events



**Agricultural Outreach Event**  
 Time TBD  
 Location TBD



**Spring into Conservation**  
 9:00 am - 12:00 pm  
 Freedom Park  
 5537 Centerville Road  
 Williamsburg, VA 23188

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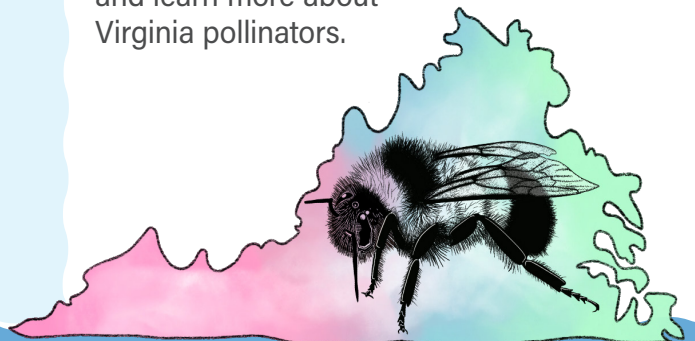
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## Colonial Pollinator Pledge

Do you love pollinators and want to do something to help native pollinators? Then try taking our Colonial Pollinator Pledge! The pledge only asks that you try your best to make five small changes to benefit pollinators. Please check out the [Colonial Pollinator Pledge on our website](#) and learn more about Virginia pollinators.





# Creativity in Stormwater Management: Rain Garden in a Box

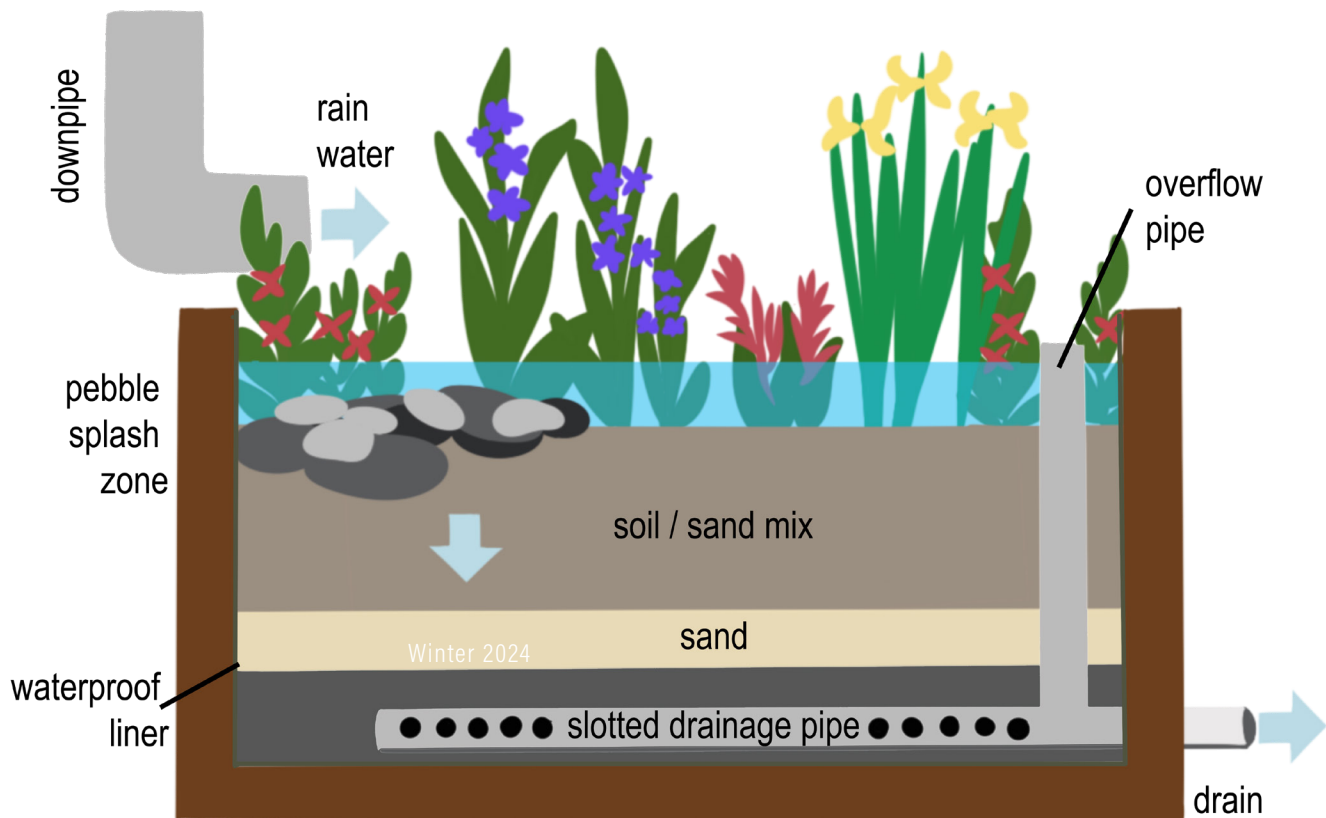
## Robyn Woolsey

So much of our work in helping community members address stormwater issues relies on the ability to capture stormwater runoff and keep it onsite, which helps to prevent flooding and erosion. Best management practices like permeable pavement, dry wells, and rain gardens require varying levels of excavation when they're installed to ensure that runoff captured within the practice has a place to accumulate and infiltrate into the native soils below.

When considering what type of stormwater management practice may be suitable for a given location, one of the key site characteristics we have to work with is the depth to the water table beneath the proposed practice location. If the water table is too close to the surface, there



**Robyn Woolsey**  
Conservation Specialist



This image shows a general cross section for a rain garden in a box. *Based on a graphic created by the RE Store.*



won't be any room for captured runoff to infiltrate into the ground and the practice would remain inundated. This is unfortunately a common issue in Coastal Virginia, so it's often necessary to implement creative stormwater management techniques.

One such technique is a "rain garden in a box," where a rain garden is installed in an above-ground container, eliminating the need for any excavation. The basic components of traditional rain gardens, including a permeable soil media, mulch, and native plants, are still utilized within the rain garden in a box, so most of the overall function remains the same. A rain garden in a box just has the added requirement of an

underdrain to ensure that excess runoff beyond what the system was designed to treat can be released to a stable overflow location away from any building foundations.

Rain gardens in a box not only allow us to implement stormwater conservation practices where they're otherwise prevented by high water tables, but they're also great for properties with limited space for landscaping changes. If you're interested in learning more about rain gardens in a box, which are also eligible for cost-share funding through the Virginia Conservation Assistance Program, feel free to reach out to me or Emma Rich.

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## Beneficial Bugs – Wonderful Wasps

### Amanda Whispell

Wasps are often misunderstood creatures. At the mere sight of a wasp, most people are frightened, and the immediate response is to destroy it – thinking that they are a pest and a painful nuisance that serves no purpose. However, this couldn't be further from the truth! These insects are far more important to ecosystems than many people realize. In this article, we'll explore what wasps are and highlight some of the key benefits they provide.

#### What Are Wasps?

Wasps belong to the order Hymenoptera, which they share with bees and ants. There are over 100 thousand described species (and certainly many more) worldwide. They vary in size (ranging from 0.139 millimeters up to 12.5 centimeters/5 inches) and come in many shapes and body forms. Unlike bees, which are hairy and primarily focus on collecting floral resources, wasps have smooth bodies and a more varied diet.

Wasps are often categorized into two types:



**Amanda Whispell**  
Education & Outreach Specialist

#### Solitary Wasps:

Most wasp species are solitary, where individuals live alone and do not form colonies. Once they have mated, an adult female solitary wasp forages alone and builds a nest for its own offspring. Some solitary wasps will congregate in a small area and nest alongside others of their species, but each is involved in caring for its



**Figure 1.** Solitary ichneumon wasp (*Dolichomitus irritator*), the long structure is an ovipositor and is used for laying eggs inside/on prey items. Photograph copyright Judy Gallagher ([Flickr](#))

## Social Wasps:

These species, like yellow jackets and paper wasps, live in colonies and do defend their nests with much gusto. Social wasps can be found in larger groups and often work together to build intricate paper-like nests from wood fibers they chew and mix with their saliva.

own offspring. Adults mainly feed on nectar, but they typically spend most of their time hunting or scavenging for food to feed their larvae. Most solitary wasps are parasitic, laying eggs on/ in other insects like caterpillars, which are then consumed by the growing larvae. Have you ever seen one of those wasps with a stinger so large that you can see it from afar? That is actually their ovipositor (the structure from which the stinger evolved – hence why only females have stingers), which solitary wasps use to lay their eggs in/on other insects (Fig. 1).

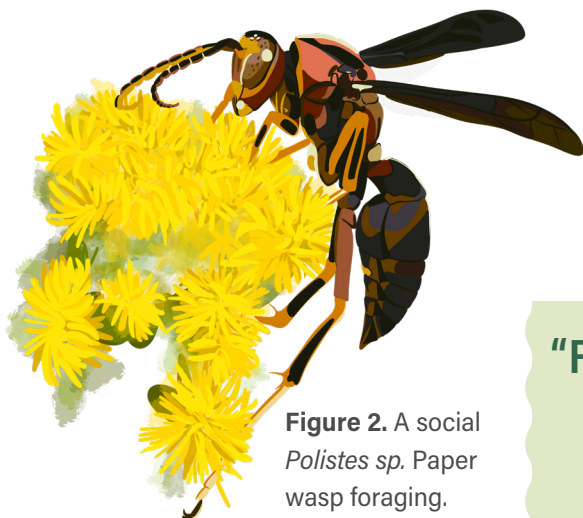
## Why Are Wasps Beneficial?

While many people fear wasps, these insects are incredibly beneficial in numerous ways.

### Natural Pest Control

Wasps are voracious predators and are incredibly effective at controlling pest populations. Many species of wasp hunt other insects such as caterpillars, plant bugs, aphids, and spiders—some of which are notorious for damaging crops, gardens, and plants.

Solitary parasitoid wasps play a very important role in controlling pest populations. These wasps lay their eggs on or inside the bodies of other insects or arthropods. The larvae feed on and eventually kill their hosts as they develop. Unlike typical parasitic relationships, parasitoid wasps eventually cause the death of their host.



**Figure 2.** A social *Polistes* sp. Paper wasp foraging.

**“Rather than fearing these industrious insects, we should recognize their ecological value and appreciate the important services they provide.”**



*Cotesia congregata* is a species of parasitoid wasp that targets tomato hornworms (Five-spotted hawk moth; *Manduca sexta*) larvae, and you may have seen them in your garden. The female wasp lays her eggs on or inside the hornworm, and the developing larvae consume the caterpillar from the inside out, then the larvae pupate all over the outside of its body (Fig. 3), eventually killing it.

### Pollination

While bees are often the go-to insects for pollination, wasps also contribute to this important ecological process. Many wasp species visit flowers to gather nectar, transferring pollen from one plant to another as they feed. This helps in the fertilization of flowers, enabling the production of fruits and seeds (Fig. 2).

A notable example of wasp pollination is the relationship between fig trees and fig wasps. The tiny fig wasp (genus *Pleistodontes*) plays a crucial role in the pollination of certain species of fig trees. The fig wasp enters the fig fruit, pollinating it while also laying its eggs inside. This mutually beneficial relationship is vital for the reproduction of fig trees and the survival of the fig wasp.

### Food Source for Other Animals

Wasps are an important food source for many other animals in the food chain. There are several bird species that are known to catch and eat wasps, as are mammals like skunks and black bears. Wasps also serve as food for other insects, including ants, dragonflies, preying mantises, robberflies, and more.

By being a food source for other creatures, wasps play an essential role in maintaining biodiversity. The animals that depend on them help regulate the populations, ensuring that ecosystems remain balanced.

### Decomposition and Recycling Nutrients

Some species of wasps, particularly scavengers, also help break down dead animals and decaying plant matter. These wasps help to speed up the process of nutrient recycling in ecosystems. By breaking down organic material, wasps contribute to healthier soils and a more fertile environment for plants.

### Final Thoughts

Though often feared, wasps are incredibly beneficial to the environment. From controlling pest populations and assisting with pollination to serving as a food source for other animals and helping to decompose organic matter, wasps play a vital role in maintaining the balance of ecosystems.

Rather than fearing these industrious insects, we should recognize their ecological value and appreciate the important ecosystem services they provide. By understanding and respecting the role of wasps, we can foster healthier environments. So next time you see a wasp, remember: it's not just a nuisance—it's a natural ally working behind the scenes to keep our world in balance.



**Figure 3.** Parasitized Tomato Hornworm (*Manduca sexta*). Photograph copyright John Brandauer. ([Flickr](#))



# VCAP Project at Williamsburg Baptist Church

## Emma Rich

Earlier this year, the Colonial SWCD staff was approached by the Williamsburg Baptist Church regarding issues of erosion and poorly vegetated areas on their property. Upon arrival, Robyn Woolsey and I noticed that the greatest area of concern was the island in the parking lot. It was home to several dying willow oak and bradford pear trees and no other groundcover, causing significant erosion and deposition of sediment. We agreed that the best course of action would be to install a VCAP practice called conservation landscaping in which native plants are used to cover bare ground and hold soil in place. The church contacted local landscape designer Jennifer Myers of Giving Gardens Design, who specializes in native plantings, to reimagine the space in a more eco-conscious



**Emma Rich**  
Conservation Specialist

way. Jennifer teamed up with local arborist Chis Phelps, of Paramount Tree Services, to remove the hazardous dying trees and begin the transformation.



Before photograph of the Williamsburg Baptist Church Parking lot island.



Some of the stand-out native species in this project include:

**Black Tupelo** (*Nyssa sylvatica*) provides beautiful autumn interest as its leaves change from green to shades of yellow, orange, scarlet red and finally purple. In spring it offers delicate white flowers that resemble *Spirea*. At maturity Black Tupelo stands 30-50' tall with a 20-30' spread.

**False Indigo** (*Baptisia tinctoria*) boasts golden yellow flower spikes with dark blue-purple seed pods in the fall. Like its yellow counterpart, Blue Wild Indigo (*Baptisia australis*) also has flower spikes but in a striking violet color. The botanical name *Baptisia* comes from the Greek word "bapto", meaning to dip or immerse - very fitting for the Williamsburg Baptist church!

Under normal circumstances, the VCAP program is able to reimburse conservation landscaping at a rate of 80% of the total project cost up to a \$7,000 maximum. However, the Virginia Association of Soil and Water Conservation Districts (VASWCD) was awarded grant funding from the National Fish and Wildlife Foundation that allowed districts to cover the entire cost of projects in public facing spaces such as schools, parks, businesses, and houses of worship. Thanks to this incredible funding opportunity, we were able to provide the Williamsburg Baptist Church with a gorgeous native garden that benefits the church and its congregants as well as William & Mary students who use the parking lot and the community as a whole.

We were very excited to be a part of this project and watch the space evolve over a few short months. Thank you to all who made this transformation possible!



After photograph of the Williamsburg Baptist Church Parking lot island.





# SWCD Technical Assistance

## Jim Wallace

Soil and Water Conservation Districts (SWCDs) are a key resource for providing conservation education, financial assistance, and technical assistance to local landowners and land users. While the first two are fairly straightforward, technical assistance is a bit more complex.

SWCDs employ knowledgeable staff who conduct site visits, take phone calls, and interact with walk-in clients to address a wide range of conservation concerns. This hands-on technical assistance is a crucial part of the SWCD's mission.

To illustrate, District staff recently helped a local farmer calibrate their yield monitor. Yield monitors measure grain entering a combine and record georeferenced data that farmers use for



**Jim Wallace**  
District Programs Manager

purposes like estimating nutrient removal and documenting yields. The calibration process involves weighing grain loads, inputting weights



A combine harvests soybeans in Charles City County, Virginia.



into the monitor, and accounting for factors like crop density and moisture.

Providing this kind of technical expertise is an integral and rewarding part of the SWCD's work. Staff must be highly knowledgeable across conservation disciplines in order to effectively troubleshoot issues and equip landowners with the who, what, when, how, and why to properly address their conservation needs.

The Colonial SWCD is committed to being a trusted advisor for local landowners and land users. Providing knowledgeable, experienced technical assistance is a core part of our mission and a priority for our Board of Directors. Whether it's calibrating precision ag equipment, interpreting soil test results, or developing a comprehensive conservation plan, our staff are here to help you address pressing resource concerns and maximize the productivity and sustainability of your operation. We'd like to give a special thanks to our colleague Trevor Guy, the Precision Ag Specialist at Three Rivers SWCD, for assisting with the yield monitor calibration. We encourage you to reach out to your local SWCD office anytime for one-on-one guidance and support. Working together, we can ensure the health and resilience of our shared natural resources for generations to come.

**"Staff must be highly knowledgeable across conservation disciplines in order to effectively troubleshoot issues and equip landowners with the who, what, when, how, and why to properly address their conservation needs."**



While picturesque, the proximity of many farm fields to rivers, creeks, and streams requires high levels of careful management to ensure nutrients and sediment do not enter local waterways.



District staff use a weigh wagon (mobile scale) to measure the volume of soybeans harvested, which will then be used to calibrate the combine's electronic yield monitoring system.



# Field Day Success at Brandon Farms!

## Samantha Pereira

On October 10, 2024, the Department of Conservation and Recreation (DCR) hosted an educational field day at Brandon Farms, led by our senior agricultural conservation specialist, Robert Waring. The hands-on event drew ag professionals from across the state for demonstrations of practical conservation techniques and cutting-edge technology.

The morning kicked off with detailed demonstrations of essential farm equipment. Participants got an up-close look at:

- Combine for harvesting corn and beans
- No-Till Multipurpose Planter
- No-Till Drill
- Aerial Seeding for Cover Crops



**Samantha Pereira**  
Conservation Specialist



Bob Waring, Senior Conservationist, explaining the mechanics of a no-till planter to attendees.



Bob explaining the mechanics of a no-till multipurpose planter to attendees.



A highlight of the day was learning in-field techniques for estimating crop yields. The hands-on session covered:

- Plant population counts
- Row spacing measurements
- Head/ear counts per plant
- Kernel development assessment
- Calculation methods for yield projection

### Summer Cover Crop Demonstration

Brandon Farms' innovative summer cover crop mix provided the perfect living classroom. Participants examined several acres of diverse species including:

- Warm-season grasses: Sorghum Sudan Grass
- Legumes: Vetch, Cowpea, Sun hemp, and Balansa Clover

The mix demonstrated how multiple species can work together to:

- Build soil organic matter
- Prevent erosion
- Support beneficial insects
- Suppress weeds
- Fix nitrogen

The day concluded with an exciting demonstration of aerial cover crop seeding using drone technology. Attendees watched as winter cover crop seed was precisely distributed across standing crops, allowing for earlier establishment without waiting for harvest.

Benefits of drone seeding highlighted included:

- Earlier seeding dates
- Reduced soil compaction
- Access to wet areas
- Labor efficiency

Thank You! Special thanks to Brandon Farms for hosting our DCR partners, and all the participants who made this field day a success. The diverse lineup of equipment demonstrations, yield estimation techniques, cover crop examinations, and drone technology showcased the breadth of practical conservation solutions available. These practical, hands-on events are vital for sharing conservation knowledge across our farming community.



Bob engaging the audience in a cover crop discussion.



2023 Fall cover crop mix to include: buckwheat, sunflower, radish, mustard, sun hemp, and Siberian kale.



# Multispecies Cover Crops and Carbon's Role in the Health of our Soils

## Robert Waring

Carbon plays a crucial role in the formation, structure, and functioning of soil organic matter (SOM), which contributes to the overall health of our soils. Soil organic matter is primarily composed of decomposed plant and animal material, which contains carbon. Plants capture carbon from the atmosphere in the form of carbon dioxide (CO<sup>2</sup>) and convert it into organic compounds. These compounds enter the soil when plant roots die or when plants are eaten by soil organisms like microbes and insects. The organic matter from these decompositions is rich



**Robert Waring**  
Senior Agricultural  
Conservation Specialist



Sun hemp cover crop.

in carbon and the interaction between carbon and SOM is vital for soil carbon sequestration; the process by which carbon is stored in soils for extended periods. Practices such as no-till farming and cover cropping can help enhance soil carbon storage by increasing the amount of organic material added to the soil. Carbon interacts with soil organic matter by contributing to its formation, decomposition, and stabilization. Through microbial processes, carbon is broken down, recycled, and incorporated into different carbon pools in the soil. Healthy soils with high

**“Ultimately, multispecies cover crops help build and maintain soil organic carbon stocks by promoting healthy, biologically active soils with enhanced carbon sequestration capacity.”**



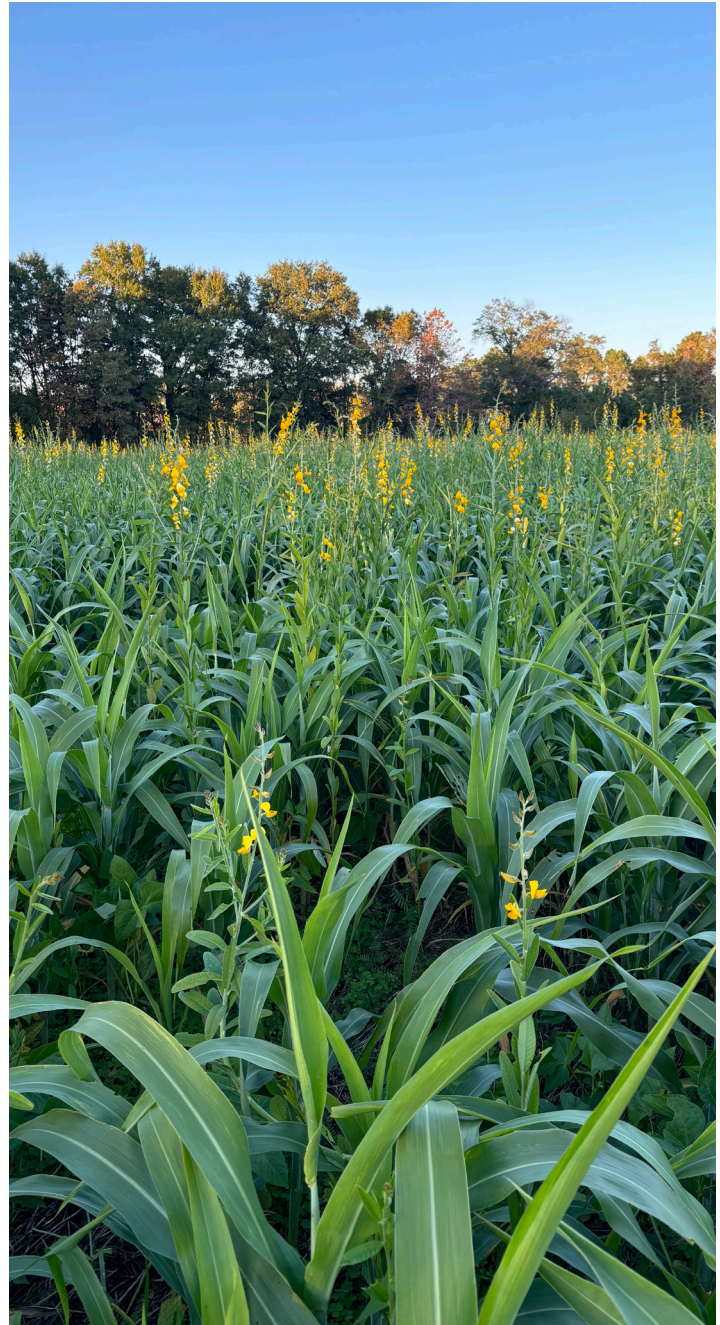
organic matter content are better able to store carbon.

Multispecies cover crops can play a significant role in increasing soil organic carbon (SOC) by providing multiple benefits to soil structure, microbial activity, and organic matter inputs. Multispecies cover crops contribute more diverse root systems to the soil compared to single species cover crops. The diversity of roots in a multispecies cover crop mix results in greater overall root mass, which means more organic matter is deposited into the soil as roots die and decompose. When different species are used in a cover crop mix, they produce a wider

variety of organic matter, which has different rates of decomposition and stability. Ultimately, multispecies cover crops help build and maintain soil organic carbon stocks by promoting healthy, biologically active soils with enhanced carbon sequestration capacity. These practices not only improve soil fertility and structure but also contribute to climate change mitigation by increasing the soil's ability to store carbon.



Sorghum cover crop.



Summer cover crop mix: sorghum sudangrass, sun hemp, vetch, cowpea and balansa clover



# Tailoring Cover Crops to your Operation

## Logan Ellis

Cover Cropping is a best management practice for farmland that has been seeing increased popularity across the nation due to its ability to help with weed control, nutrient recycling, erosion prevention, compaction relief, and many other benefits. While more producers every day are making the switch and trying cover crops on their farm, many of them find a species that they like working with and tend not to explore the other options. Depending on the issues facing any farm, a cover crop can be tailored to assist in those issues and can bring tremendous benefits to your soils. While anything planted with the intention of covering fields during fallow periods would be considered a cover crop, there tends to be three main types that producers favor:

### Cereals/Grasses

Tend to grow quickly and establish well in the fall, with a deep root system that helps recycle nutrients that may have been lost to leaching over the winter. The quick vegetative cover also



## Logan Ellis Conservation Specialist

helps prevent nutrient loss through soil erosion over the winter. Different cereals can have different benefits. Cereal rye has a higher Carbon to Nitrogen (C:N) ratio and can act as a weed barrier during the early stages of the crop's life, especially if it was rolled down before planting. Black Oats however have a lower C:N ratio and also have that deep root system that can help recycle nutrients and make them available earlier



High biomass black oats cover crop.



in the crops life than other cereals.

### Legumes

Legumes can produce high amounts of biomass with a lower C:N ratio, allowing the plant to break down quicker and release those nutrients to the following crop earlier in its life cycle. The main benefit to legume cover crops is their ability to convert atmospheric N into plant available N. It is for this reason that many people look to put a nitrogen fixing cover crop before a high N-using crop such as corn, as it allows them to cut back on N applications the following season, as well as the costs associated with that application.

### Root Crops/Brassicas

Brassicas tend to perform very well in the cold weather and put out a lot of growth quite quickly, aiding in weed control and suppression during the winter months. The tillage radish offers a unique benefit to a crop field, these plants grow much larger than your grocery store varieties and help break up hardpans, and other impenetrable surfaces in the soil. This can help reverse soil compaction and works well if partnered with other compaction preventing methods. These crops tend to leave behind a "minefield" of phosphorus the following year when they decompose.

Blending different varieties of cover crops is recommended to find the right fit for each farm. Blending can help you address multiple issues and provide biodiversity to your operation for example, If you have a sandy field with low organic matter, you may want

**"Depending on the issues from farm to farm, a cover crop can be tailored to assist in those issues and can bring tremendous benefits to your soils."**

to try high biomass, low C:N ratio crop blends to help build organic matter such as a vetch and black oat. If you have heavier soils that are prone to weed control and compaction issues, a cereal rye and tillage radish blend may help address those specific issues. Take time every year and think about what cover crops would fit your farm best and do not be afraid to try different crops for different fields.



Cereal rye and hairy vetch cover crop.