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**Resources**

Cover Crops USA | covercropsusa.com  
N-Vest® | ciscoseeds.com/nvest.php  
CISCO Farm Seed Blog | ciscофarmseed.com  
NRCS | nrcc.usda.gov  
Midwest Cover Crop Council | http://mcc.ms.edu/  
Indiana Conservation Cropping Systems Initiative | cccin.iaswcd.org  
SoilHealth.Net | soilhealth.net  
Conservation Technology Information Center | ctic.purdue.edu  
Soil Health Partnership | soilhealthpartnership.org

• N-VEST® is a proud supporter of the Soil Health Partnership •
IT’S ALL ABOUT YOUR HEALTH—SOIL HEALTH

Pick up any farm newspaper in the last five years and it would be hard not to find an article regarding soil health issues. Modern cropping systems over the last 50 years, all minds agree, have taken their toll on productivity. With the advent of modern fertility and herbicide practices we have arguably taken the easy route in managing these very important crop inputs. Economics dictate that we cannot go back in time to a corn, soybean, wheat and clover rotation. However, incorporating a well thought out cover crop management program will help the soil function as a living ecosystem and have it derive all the benefits that we are presenting in CISCO’s N-Vest® Cover Crop Guide. We hope that the information in this guide will help you make some of those important management decisions.

Cover Crop Benefits

- Protect the soil surface from erosion & improve water infiltration
- Elevate water holding capacity of the soil
- Suppress weeds
- Guard the soil surface from extreme temperatures, rain, and wind
- Improve soil structure & reduce compaction
- Increase yield potential
- Raise soil organic matter levels and improve soil physical properties
- Mineralize, reposition, and scavenge nutrients in the soil and utilize them for the next crop
- Enhance soil biological activity and health
- Produce forage, reducing feed costs
- Potentially reduce nutrient costs
**Soil Surface Protection**
There are many reasons to adopt cover crops into your farming operation. Cover crops protect the soil surface from water and wind erosion, allowing you to keep your soil on your farm. Cover crops form a canopy to shield the soil surface from extreme temperatures and heavy, pounding rains. Cover crops also give us the ability to keep water on the farm by allowing water enough time to soak into the soil, preventing run off.

**Soil Structure**
Over time, a living cover crop, along with earthworms, will change the soil structure on your farm. Cash crop roots will penetrate the soil with greater ease, more oxygen will enter the system, more chemical reactions will take place, and a larger microbial population will grow. Reaching a 25% air to 25% water ratio will optimize plant nutrient availability. As cover crops grow and die, resilience is brought back to the soil, particles stick together (flocculate), and compaction is reduced.

**Decreasing Undesirables**
Cover crops suppress weeds in two ways – by direct competition and by shading the soil. In some cropping systems, using a cover crop as a companion to the primary crop (growing between rows or underneath the canopy) will help out-compete weeds. Cover crops, like cereal rye, release allelopathic compounds that deter weed germination. Other cereal grains like oats, barley, millet, sunflowers, buckwheat and sorghum sudan are very good in weed suppression as well.

**Organic Matter**
Organic matter percentage of soil volume expands as the cycle continues. More nutrients are securely stored in more humus as it develops over time. Measuring organic matter increases is a multi-year process, but not a lifetime process, as we used to believe. The short term soil structure improvements give us physical evidence of organic matter increase.
PLANT SEED—NOT GRAIN

With the N-Vest® brand there are never any compromises when it comes to seed quality. N-Vest® cover crop seed offers the following advantages:

• Seed fields are monitored from planting, throughout the growing season, and at harvest to make sure there are no issues with potential weed problems or varietal purity.
• Seed is professionally conditioned, cleaned, and packaged.
• Every lot of seed is tested at harvest and after conditioning by laboratories approved by and standards set up by the Association of Official Seed Analysts.
• Any mixing is done in our facility, by our people, with our equipment, which is designed to gently handle seed.

Do not take the chance of introducing new and potentially invasive (and glyphosate resistant) weeds to your farm by buying “cheap” seed.

A Word About “Dormant” Seed

Certain species of seeds that are utilized for cover crops have shown a portion of dormant seed present. “Dormant” seed contains properties that inhibit germination right away. This is nature's way of making sure the species continues. For example, if a disease eliminated every radish on Earth, next year there would be approximately 4% of radishes that would emerge, as that is a normal level of dormancy for that species.

Dormancy also occurs in annual ryegrass and crimson clover. There have been examples of fields planted in the fall to annual ryegrass and radish and the next fall having a better stand than the previous fall when it was planted. The stand was established from dormant seed leftover from the initial planting.

We are working to determine normal dormancies, but it is very inconsistent as it depends on seed production growing conditions and the age of the seed. The point is to be aware that this can happen, and it is normally not a production detriment.

Most annual ryegrass we sell is the previous year’s crop, so dormant seed is not an issue.
N-VEST® CRIMSON COVER-ALL MIX

- Improved crimson clover and Scav-N-Ger® radish
- Nitrogen producer (legume) plus a nutrient scavenger (brassica)
- Crimson clover has a fine, fibrous root system
- Crimson clover can produce anywhere from 70-140 lbs of nitrogen/acre
- Great for building soil tilth and structure
- Best planted after wheat; excellent choice before corn
- Crimson clover usually overwinters; the radishes will winterkill below 22°F
- Plant at least six weeks before killing freeze

**Planting tips:**
- Planting Rate: 17-20 lbs/acre
- Planting Depth: 1/4-1/2”
- Planting Time: Summer/Fall
**N-VEST® GROUNDBREAKER MIX**

- Austrian winter peas and Scav-N-Ger® radish mixture
- Great nitrogen producer plus a scavenger
- Huge biomass builder
- Fast nodulating peas can produce up to 90-150 lbs. of nitrogen/acre
- Great for helping suppress weeds
- Quick source of available nitrogen as peas break down rapidly in the spring
- Peas can survive down to 10°F or overwinter if there is adequate snow cover
- This mixture works best when drilled and peas inoculated
- Radish will winterkill below 22°F
- Plant at least six weeks before killing frost

**Planting tips:**
- Planting Rate: 35 lbs/acre
- Planting Depth: 1/2-3/4”
- Planting Time: Summer/Fall

Scavenging nutrients, producing nitrogen, & multiplying earthworms

Weed suppression

Overwintering peas provide living mulch

Mulch inhibits weeds and preserves moisture
N-VEST® OAT-RADISH MIX

- Great for novice cover cropper or the most experienced
- High quality oat seed plus proven Scav-N-Ger® radish
- Soil tilth builder and nutrient scavenger
- Winterkills for easy management
- Great for biomass and erosion control
- Plant at least six weeks before killing freeze
- 50lbs/A minimum rate, 80-100lbs when applying manure before planting

Planting tips:
Planting Rate: 50-80 lbs/acre
Planting Depth: 1/2-3/4”
Planting Time: Summer/Fall
N-VEST® NUTRIBUILDER MIX

- Three way mixture of winterhardy annual ryegrass, improved crimson clover, and Scav-N-Ger® radish
- More diverse mixture improves soil health
- Nitrogen producer plus two scavengers
- Great for improving earthworm populations
- Crimson clover usually overwinters, radishes will winterkill, and the annual ryegrass will need to be terminated in the spring
- Plant at least six weeks before killing frost

Planting tips:
- Planting Rate: 25 lbs/acre
- Planting Depth: 1/2-3/4"
- Planting Time: Summer/Fall
N-VEST® FORAGER MIX

- Grazers’ choice for cover crop
- Oats, cereal rye, plus forage turnips
- Oats and turnips can be grazed in the fall
- Cereal rye can be grazed in the spring
- Great for additional grazing acres while utilizing a cover crop
- Turnip leaves are high in protein
- Great with manure application
- Plant at least four weeks before killing frost
- 100lbs/acre recommended for average grazing demand

Ready to be grazed in 60 days

Adds diversity to soil health

Balanced ration for cattle

**Planting tips:**
- Planting Rate: 100-120 lbs/acre
- Planting Depth: 1/2-3/4”
- Planting Time: Summer/Fall
N-VEST® WINTER HAWK ANNUAL RYEGRASS

- Very durable, winterhardy annual ryegrass
- Number one in winterhardiness at The Ohio State University cover crop trials
- Breaks dormancy evenly in the spring
- Deepest root system of any cover crop
- Huge biomass builder and soil tilth improvement
- Overwinters very well; easily killed
- Roots have been found over 40” deep
- Great forage
- No dormant seed
- Drilled is always best

**Planting tips:**
- Planting Rate: 10-20 lbs/acre
- Planting Depth: 1/4”
- Planting Time: Fall

Quick establishment & quick cover

Good biomass producer

Thick cover gives good weed suppression

Deep, fibrous root structure
**N-VEST® SUMMER SOIL ENHANCER MIX**

- A mix of sorghum sudangrass, pearl millet, and crimson clover
- Excellent choice for soil improvement
- Feeds soil microbiology during the summer months
- Helps suppress weed growth
- Can be used as spring feed

**Planting tips:**
- Planting Rate: 25 lbs/acre
- Planting Depth: 1/4-1/2”
- Planting Time: Summer

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**N-VEST® SUMMER SOIL & FORAGE MIX**

- A mix of sorghum sudangrass and buckwheat
- Excellent choice for soil improvement
- Feeds soil microbiology during the summer months
- Helps suppress weed growth
- May also be utilized as a forage

**Planting tips:**
- Planting Rate: 25 lbs/acre
- Planting Depth: 1/4-1/2”
- Planting Time: Summer
What is Graze King 90?
Graze King 90 is a fall planted cereal grain that can be used as a forage in the following spring. Planting dates range from September to late November, depending on your latitude and growing conditions. Cereal rye is very adaptable because of its ability to be planted very late in the fall yet have outstanding winterhardiness.

Graze King 90 has been selected for improved forage yields and quality due to increased tillering and leafiness. Dry matter yields can range from 2 to 4 tons/acre plus. Graze King 90 can be grazed in the fall as long as 4” of leaf area is left on the plant. It can be mixed with oats and turnips/radishes for improved fall grazing.

Soil Health Benefits of Fall Planted Cereal Rye
Don’t forget to think about the soil health benefits of using cereal rye in the fall. It has a wonderful fibrous root system that is only out-performed by annual ryegrass. Cereal rye roots have been shown to reach over 40” in depth. It is a great scavenger of excess nitrogen (N) and other nutrients found in the soil profile. Consider adding a couple pounds of Scav-N-ger® Radishes to the cereal rye when it is being planted.

Fertilizing Graze King 90
Fertility management for Graze King 90 is very similar to wheat. It requires about 30 lbs/acre of nitrogen in the fall, whether it is from manure, legume nitrogen credits such as soybeans, or commercial fertilizer. In the spring, cereal rye performs optimally with 60-70 lbs/acre of nitrogen. This can be applied at the same time wheat is being topdressed. Excess nitrogen can cause lodging and nitrogen runoff.

Planting and Harvesting Times for Graze King 90
Graze King 90 works well after corn silage, soybeans, or a summer annual crop such as Sweet Six BMR sorghum sudangrass. In the fall it will remain vegetative. The overwintering process will promote vernalization and the cereal rye will begin its reproductive life cycle in the spring.

Harvest in the Midwest usually occurs in late April or early May. Optimal harvest is at the flag leaf stage. Once heading occurs, forage quality begins to drop, with crude protein (CP) decreasing and NDF and ADF increasing. Realize that the more growing degree days (GDD), the more rapidly cereal rye can mature.

If the temperature is in the 70's in late April, cereal rye can go from vegetative to headed out in only a few days. Pay attention as the crop matures to the weather and the plants. Cereal rye can be grazed, hayed, chopped, or wet wrapped.
The Same Field One Month Later
Most of the cereal rye grew to 18" in height and responded well to the nitrogen fertilizer.

Each plant has two joints located on the stem and a flower located about 10" up the stalk.

The crop should be ready to harvest in 10-14 days. This is assuming normal spring heat and moisture.

Harvest Time
Below are pictures of what the field looked like when harvested on May 5.
<table>
<thead>
<tr>
<th>crop</th>
<th>variety</th>
<th>species</th>
<th>forage</th>
<th>planting</th>
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<td>VNS, Haywire</td>
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All seeds listed above are available through CISCO.
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<td>10</td>
<td>35-50</td>
<td>1/2-1&quot;</td>
<td>Biomass builder</td>
<td>Scavenger</td>
</tr>
<tr>
<td>20-22 F</td>
<td>10</td>
<td>35-50</td>
<td>1/2-1&quot;</td>
<td>Fast growing</td>
<td>Scavenger</td>
</tr>
<tr>
<td>15 F</td>
<td>5-7</td>
<td>2-4</td>
<td>1/4&quot;</td>
<td>Drought tolerant</td>
<td>Scavenger</td>
</tr>
<tr>
<td>Overwinter</td>
<td>7</td>
<td>1-6</td>
<td>1/4&quot;</td>
<td>Great N source</td>
<td>Producer</td>
</tr>
<tr>
<td>Overwinter</td>
<td>7-10</td>
<td>25-60</td>
<td>1/2-1&quot;</td>
<td>Shallow fiber roots</td>
<td>Scavenger</td>
</tr>
<tr>
<td>32 F</td>
<td>7-10</td>
<td>7-10</td>
<td>1/4-1/2&quot;</td>
<td>Soil enhancer</td>
<td>Scavenger</td>
</tr>
<tr>
<td>32 F</td>
<td>7-10</td>
<td>15-60</td>
<td>1/2-1&quot;</td>
<td>Quick biomass</td>
<td>Producer</td>
</tr>
<tr>
<td>32 F</td>
<td>2-10</td>
<td>2-10</td>
<td>1/4&quot;</td>
<td>Deep taproot</td>
<td>Scavenger</td>
</tr>
<tr>
<td>32 F</td>
<td>7</td>
<td>15-25</td>
<td>1/2&quot;</td>
<td>Great forage</td>
<td>Scavenger</td>
</tr>
<tr>
<td>32 F</td>
<td>4-5</td>
<td>1-5</td>
<td>1/2&quot;</td>
<td>Legume nurse crop</td>
<td>Scavenger</td>
</tr>
<tr>
<td>32 F</td>
<td>7</td>
<td>15-20</td>
<td>1/2-1&quot;</td>
<td>Quality forage</td>
<td>Producer</td>
</tr>
<tr>
<td>32 F</td>
<td>3-5</td>
<td>5-10</td>
<td>1/8-1/4&quot;</td>
<td>Drought tolerant</td>
<td>Scavenger</td>
</tr>
</tbody>
</table>

*Seeding rates vary depending on if it is a pure stand or a mixture. Aerial application 20% above drill rates; forage 100% above drill rates.
Balansa clover is relatively new in the cover crop world. It is an annual clover that is generally fall seeded and can be seeded later than crimson clover. It has been selected for winterhardiness, nitrogen production as well as a great biomass production in the spring. The picture below shows corn being no-till planted into a thick crop of balansa clover. Fixation balansa clover can produce up to 200 lbs/A of nitrogen.

Balansa clover can be mixed with small grains such as Graze King 90 cereal rye to use for livestock feed. Don't be dismayed with the amount of fall top growth out of Fixation, but take a shovel and look at the root system. The roots are where Fixation really shines. Fixation balansa clover is well suited for being part of your diverse cover crop program.
With the growing demand for cover crops, The CISCO Companies invested in a seed mixing system with capabilities to meet today’s customer requirements. CISCO can handle all of your FIBC (Flexible Intermediate Bulk Container), or tote requirements along with small packaging requirements, all without the worry of cross contamination between mix batches. Innovative cleanout straps offered by the bucket elevator manufacturer and close tolerances in the mixer offer a very easy and thorough cleanout for the operators.

The seed is blended in one of two horizontal mixers featuring paddle blades for gentle mixing of the seed. The mixer operates at approximately 24 RPM so that the seed is not damaged and any coatings are not chipped off during the blending process. Each mixer can hold 133 ft³ of material or 6,650 lbs. based upon a 50 lbs/ft³ seed density. The gentle handling of the seed doesn’t stop at the mixers. All of the elevators feature gentle handling options to make sure, during transfer, the seeds are kept undamaged.

At full capacity, this new mixing system can operate at approx. 20,000 lbs/hr when loading into FIBC units.
NITROGEN PRODUCERS—SPRING SEEDED

**Medium Red Clover**
- Works well when spring frost seeded into winter small grain crops such as wheat
- Can produce 75-150 lbs of nitrogen/acre
- Deep tap roots complement the roots of the companion grass crop for soil health improvement
- Many producers will take one or two harvests of red clover for forage

**Mammoth Red Clover**
- Frost seed in the spring with a winter small grain crop
- Good for biomass production and improved soil tilth
- Matures later than medium red clover
- Can produce 65-110 lbs of nitrogen/acre
- Deep tap root

**Yellow Blossom Sweet Clover**
- Frost seed in the spring into winter small grain crop
- Great pollinator
- Exceptional ability to restore depleted mineralized soils
- Large tap root with vigorous growth
- Great for biomass production, but not recommended for forage
- Mixes well with other clovers

**Alsike Clover**
- Frost seed in the spring into a winter small grain crop or drill into a spring seeded small grain crop
- Tolerates wet and/or acidic soils
- Shallow root system compared to other clovers
- Can produce 40-60 lbs of nitrogen/acre as well as provide good forage for ruminant livestock
- Perennial clover that tillers profusely from the crown
NITROGEN PRODUCERS—SUMMER SEEDED

Cowpeas
- Warm-season legume that can produce 100-150 lbs of nitrogen/acre
- Rapid summer growth with adequate moisture, but also drought tolerant
- Terminates with a frost
- Outcompetes and smothers weeds with large amounts of biomass
- Mixes well with sorghum sudangrass and many other summer annuals as a forage

Sunn Hemp
- Warm-season legume that can produce up to 100 lbs of nitrogen/acre
- Resistant to nematodes
- Mixes well with other summer annuals (4-5 lbs/acre sunn hemp) for soil building
- High seeding rates produce large amounts biomass, increased organic matter levels, and increased soil fungi populations
- Can reach 6 feet tall in 60 days

Frosty Berseem Clover
- Cool-season annual clover that does not cause bloat in livestock
- Survives in the fall to 5°F
- Rapid summer growth that can be hayed or grazed multiple times
- Good nitrogen producer with 100-180 lbs of nitrogen/acre available in the plant’s total biomass
- Works best following wheat harvest

NITROGEN PRODUCERS—FALL SEEDED

Fixation Balansa Clover
- Annual clover with a deep tap root that can produce up to 200 lbs of nitrogen/acre
- Vigorous root growth in the fall with abundant top growth in the spring
- Great choice for high yielding spring harvested forage crop
- Can be seeded later than any other clover
- Matches well with cereal rye and fall triticale
- Hollow stem improves hay drying rates
NITROGEN PRODUCERS—FALL SEEDED

Hairy Vetch

- Top nitrogen producer, excellent for phosphorous scavenging, and soil improvement
- Needs 5-6 weeks of growth in the fall to overwinter
- The variety Vallana produces almost no hard seed and is very winter hardy
- Beneficial cover crop alone or in a multi species mixture
- Great forage when mixed with small grains or annual ryegrass

Crimson Clover

- Excellent nitrogen producer when planted early, i.e. a month after wheat harvest
- Generally, overwinters in northern climates
- Performs very well in mixes, especially with annual ryegrass and radishes
- Can produce 60-100 lbs of nitrogen/acre
- Easy to terminate in the spring
- Needs 6 weeks of growth in the fall before a killing frost

Austrian Winter Peas

- Fall seeded field pea that can produce 90-150 lbs nitrogen/acre
- Can winterkill below 20°
- Works very well with Scav-N-Ger® radish
- Most effective with 6-8 weeks of growth in the fall
- Mixes well with oats or spring triticale as a forage

Frostmaster Winter (Forage) Peas

- Low tannin (white flowers) forage type winter pea
- Great for a dual-purpose forage/cover crop
- Produces more biomass than Austrian winter peas
- Very sweet taste to livestock
- Cold tolerant
NUTRIENT SCAVENGERS—SUMMER SEEDED

Buckwheat
- Fast growth broadleaf with a very fine, fibrous root system
- Great for improving soil tilth and mineralizing phosphorous
- Can flower within 35 days of emergence
- Terminates with first frost
- Great pollinator

Forage Sorghum
- High biomass producer
- Drought tolerant, water efficient
- Plant a BMR variety for livestock use
- Low seeding rates
- Outstanding root system
- Please reference the CISCO Forage Guide for more information

Pearl Millet
- Summer annual crop that is very drought tolerant
- Performs well in low fertility and pH situations
- Use a BMR for grazing or hay; no prussic acid issues
- Low seeding rate
- Performs well in cover crop mixtures

Sorghum Sudangrass
- Great in a mix or solid stand
- Use a BMR variety for livestock
- Very water efficient and/or drought tolerant
- Great double crop option after wheat
- Please reference the CISCO Forage Guide for more information
NUTRIENT SCAVENGERS—SUMMER SEEDED

Phacelia
- Wonderful pollinator
- Fine, fibrous root system
- Plants can reach 4’ in height
- Most economical use in a mixture

Sunflower
- Deep rooted broadleaf
- Rapid summer growth with a lot of biomass
- Performs well in cover crop mix
- Terminates with a freeze

Teff
- Fine stemmed with soft leaves, rapid growth summer annual grass
- Extensive root system for nutrient scavenging
- Tolerates wet soil
- Requires a very firm seedbed
- Good for dry hay production and high forage quality
NUTRIENT SCAVENGERS—FALL SEEDED SMALL GRAINS

Cereal Rye
- Fall seeded cereal grain that is very winter hardy
- Most common and economical fall seeded cover crop
- Known for weed suppression with allelopathy
- Huge soil tilth builder and nutrient scavenger because of its immense root system
- Graze King 90 cereal rye well suited for forage production

Spring Triticale
- Spring annual that will winterkill
- Great forage, especially when mixed with Frostmaster peas
- Can produce higher yields and forage quality than oats

Fall Triticale
- Cross between Durham wheat and cereal rye
- Yield and cover crop benefits of cereal rye with improved forage quality
- Easier to control than cereal rye in a rotation where volunteer plants are unwanted
- For an outstanding dual-purpose forage/cover crop, use TriCal Flex 719

Winter Barley
- Valor winter barley is the most winterhardy variety in the Midwest
- High forage quality with early maturity
- Excellent standability and straw production
- Needs to be planted earlier than other small grains
NUTRIENT SCAVENGERS—FALL SEEDED SMALL GRAINS

Spring Oats
- Quick fall growth, great soil builder, excellent for capturing nutrients
- Can be used as a forage; consider Haywire forage oats
- Terminates at 22°F, generally does not overwinter in the Midwest
- Excellent choice for erosion control and ease of use

Black Oats
- Rapid growth in the summer or early fall
- Allelopathic effect on weeds
- Good for forage
- Will winterkill

Cover Crop Wheat
- Good fall growth with fibrous roots
- Shallowest root system of small grain crops
- Good winter survivability
- Easy to terminate in the spring
- Inexpensive cover crop option

NUTRIENT SCAVENGERS—FALL SEEDED BRASSICAS

Dwarf Essex Rape
- Fibrous root system
- Overwinters
- Good for grazing cattle
- Can be very difficult to terminate in the spring if allowed to go to seed
NUTRIENT SCAVENGERS—FALL SEEDED BRASSICAS

Kale
- Highly palatable as a forage
- Thick canopy protects the soil surface
- Works well in mixtures

Mustard
- Cool-season spring annual
- Very deep taproot
- Suppress weeds with rapid growth and canopy
- Adds diversity to cover crop mixtures

Scav-N-Ger® Radish
- Daikon type radish
- Great nutrient scavenger with deep tap root and fine root hairs
- Can help reposition nutrients in the soil profile
- Mixes well with small grains, either for cover crops or forage
- Generally winterkills

Turnips
- Great forage for ruminant livestock
- Can overwinter, but are easy to terminate in the spring
- No smell in the spring like radishes
- Works well with forage oats
Do not be dismayed if the radishes in your field don't look like prize-sized radishes that are as big as your forearm. The reality is that cover crop radishes do a great deal of good for your soil after approximately 6-7 weeks of growth. The benefits of 6-7 weeks of radish growth are as follows:

- Excellent for reducing soil compaction - University of Maryland researchers found that radish roots can penetrate plow pans and other layers of compacted soil
- Although the upper part of the taproot may be 6-12”, the lower part can extend 20” or more (this is the part you always break off when pulling them out to admire)
- The radish creates a root channel after winter killing for subsequent crop’s roots and water infiltration & holding capacity
- Radishes can scavenge nitrate and make it available to the subsequent crop
- The forage of radishes is known to attract and feed earthworm populations
- Very compatible with seed oats
- Can be aerial applied
- It takes several nights of temperatures in the low 20’s to winterkill radishes, therefore resulting in decent growth into November
Expect the following from Pinnacle Quickstart:

- Increases seed & seedling survival
- Establishes a microenvironment for stimulating vigorous growth in young seedlings
- Achieves better seed to soil contact to aid germination
- Hygroscopic nature of the coating pulls & holds moisture to the seed, aiding germination
- Encapsulates each seed in a carefully formulated mix of minerals & selected nutrients
- Specifically formulated micronutrient package of Fe, Mg, & Zn
- Coating disguises seed for less bird predation
- Colorant on the seed improves monitoring of area seeded & seeding rate
- Increases stand & survival under adverse conditions
- Added weight from coating material:
  - Makes seed larger & easier to handle & distribute evenly
  - Less puddling of seed – seed stays put in over-watering conditions
  - Penetrates stubble or thatch for better seed to soil contact
  - Increases spread width up to 40%

Get better, more consistent stands with Pinnacle QuickStart.

Pinnacle QuickStart coating is available on GroundHog radish and Scav-N-Ger® radish.
Combining grazing with cover crops is like 1+1 = 3. You start with the animals and the cover crop (forage), but then you end up with so much more.

First, there is the benefit of the cover crop and manure for soil health. Nutrients are being cycled. Approximately 66% of the phosphorous and 90% of the potassium that is in a plant when grazed are returned to the soil in the form of manure (The Ohio State University research). Organic matter is also being produced which, in turn, improves nutrient cycling and water holding capacity.

Second, you benefit from the weight gain on the animals. And all of this without high quantities of stored feed. Diverse mixtures tend to be high in forage quality, palatability, and can often provide high average daily rates of gain.

Finally, the farm ground is being utilized in a time where it is not productively producing row crops. It is important to utilize farm ground throughout the year, not only from an economic point of view, but also from a soil biology point of view.
Remember that cover crop diversity improves animal gains and soil health. CISCO sells a full line of cover crops that will help you maximize the profit potential on your acres.

In a recent article in Successful Farming, Mary Drewnoski, Extension Beef Systems Specialist at the University of Nebraska-Lincoln (UNL), walks us through several different options for maximizing land use with the addition of a fall cover crop. Why let those acres go to waste?

First, she notes that there are options. You can choose a cool-season or a warm-season species, depending on what your goals are and how early you can get in the field. Second, she notes the variability that can occur with the date you plant. Often, the earlier you can get in the field, the more tonnage you can harvest. Finally, you must determine when you want to graze these crops. If you’re after fall forage, you may choose a crop like oats for its fast growth, even though it will winterkill. If you’re after spring grazing, you may choose a crop like cereal rye or triticale.
Here is the basic idea when interseeding cover crops. Seed them between V3 & V6. The covers will grow approximately 6 inches tall. At that point the corn will shade them, stopping their growth, and they go “dormant,” using just enough water and nutrients to stay alive. Once the corn starts to dry down and sunlight gets to the covers, they start growing again. Corn is harvested, and the covers really start growing. There has been no change in corn yields over multiple years and a slight increase in some years.

Request to join the closed Facebook group “Interseeding V3-V6 Corn” to join a progressive group of Midwest farmers sharing information.

Interseeding was very common back in the 1920’s & 1930’s when legumes were seeded at the same time of last cultivation, but then again row spacing and plant populations were very different then too.

We are unsure of how far south it will work. Central Indiana seems to be pushing the limits . . . more testing is occurring.

**Key Variables**
- Choose a corn hybrid with upright leaves or flex ears = less total shading period during August. Hybrids tend to be shorter north of I-80 and day lengths are longer, resulting in more sunlight getting to the covers.
- Choose a corn hybrid that is shorter than 7 feet because there is less shade time.
- Plant at less than 36K populations. 34K is ideal.
- Seed cover crop at V3 stage, which is typically 6 weeks after planting.
- Count the number of collars. Do not judge the corn while driving by at 55 mph. It may be growing rapidly, and the covers may not obtain sufficient growth before shading occurs (resulting in loss of cover crops stand).
Herbicide Selection is Key
Residual herbicides need a “light” footprint as one will be seeding a cover crop 3-4 weeks after planting corn. Verdict, Sharpen, Harness, and Outlook are some of the short residual herbicides that can be used. Rate, timing, and type of cover crop is also important (cool season grass, brassica, or legume).

Planting Roundup Ready® Corn and applying glyphosate just before interseeding is a popular option. The additional competition of the covers typically helps with weed control.

Go to www.interseedingcovers.com for guidance.

Species to Seed
Many covers can work, such as annual ryegrass, crimson clover, red clover, kale, berseem clover, hairy vetch, daikon radish, Austrian winter peas, cowpeas, sunn hemp, and buckwheat. Cereal rye and oats have only worked in the northern part of North Dakota or Minnesota (can't tolerate too much shade). A cover crop mixture also works well. Use the same seeding rates as in the fall. Large seeds must be drilled or incorporated.

Seeding Options
• Incorporating seed (drill, sidedress, rotary hoe, cultivate, etc.) of some kind is best as the goal is to get fast emergence and good establishment before corn canopies.
• Broadcast can work if rain comes.

What About Soybeans
Although interseeding into soybeans has been tried, success has been very inconsistent due to too much shade from the soybeans and/or too dry of conditions. However, it has been successful if done into double crop soybeans after wheat. The rowed soybeans are planted too late to fully canopy.

As with anything new, try it on 10-20 acres and see how it works. You may be pleasantly surprised.
Cisco Farm Seed
Hay, Pasture, Summer Annuals, Cover Crops

For the latest information from Cisco Farm Seed, visit our website at www.ciscofarmseed.com and sign up for newsletters and notifications.
Your farmland is truly your most precious commodity - don’t let its true potential slip through your fingers. To help you get the most out of it, CISCO Seeds has developed a line of premium cover crop seed products. These products will help rejuvenate your land and improve soil tilth by holding on to expensive nutrients, breaking up soil compaction and increasing overall biodiversity which is critical for improved crop production. N-VEST cover crop mixtures have been evaluated on farms, in trial plots, and in conjunction with many universities and Soil & Water Conservation Districts.

N-VEST in your precious commodity - choose
N-VEST cover crop seed.