



Product Guide



Tillage Radish
The Original and Only

Tillage RootMax
Deep Root Annual Ryegrass

TillageMax BLENDS
High Performance Cover Crop Blends Featuring Tillage Radish®

1-800-767-9441
CoverCropSolutions.com





Home of the Tillage Radish®

The Benchmark of Quality in Cover Crops

Cover Crop Solutions is a seed company that stands for something new in agriculture.

What's new is a fresh approach to cover cropping and to the discovery of ways it increases plant and soil production.

Advancements are being made in cover crops to enhance soil health and increase nutrient management while providing a living cover during the off season. Cover crops are proving to further enhance cash crop yields, build top soil, increase earthworms and improve soil and plant health in ways that pay.

Cover Crop Solutions stands on the principle of using cover crops to make a positive contribution to the farm's bottom line.

For us, it's all about building and maintaining a high level of soil health so that this incredible food-generating engine can function at peak performance. Cover crops are a key tool in this "soil first" approach to higher yields and even more robust bottom lines.

That's why we are so highly focused on cover crops that are not only unique, but are also certified for genetic purity. And it's why we support ongoing university and highly controlled farm-based research to stay at the forefront of the science of cover crops.

Ask us to show you how cover crops are a proven way to reduce input costs without compromising high yields, and why we produce and supply "cover crops that pay."



A Word from Steve Groff



Farmer and cover crop innovator
Cedar Meadow Farm
Holtwood, PA

We have fields at our farm that have not seen tillage equipment in 30 years. My interest in cover crops started with knowing that uncovered soil easily erodes into places like our nearby Chesapeake Bay. Working with university researchers like Dr. Ray Weil from the University of Maryland, however, gave me an entirely different respect for what good management can mean in terms of the soil's response to practical, common sense approaches to building soil health.

Out of helping test and develop the Tillage Radish,® one of the most remarkable advances in cover crops in recent memory, Cover Crop Solutions was founded on the idea of being one of the farmer's best friends.

As one of the company's partners, I will always be a farmer first and foremost. As a farmer, we are stewards of the land, the growers of food, and producers of many raw materials with all kinds of industrial applications.

Thank you for your commitment to learning how cover crops will help keep our soils healthy, productive and sustainable.



Home of the Tillage Radish®

Treat Cover Crops Like Your Cash Crops!

Here are 10 tips to help you tackle cover crop seed selection:

1 Performance over price

Just like you purchase seed corn, soybeans, and other cash crop seed, buy cover crop seeds on value with seed genetics that produce the traits and benefits you desire. Utilize knowledgeable Cover Crop Solutions seed dealers who provide resources and experience that help you choose cover crops that pay.

2 Spread risk

Follow the fundamentals of cash crop establishment and plant as soon as possible after harvest or prior to harvest. Plant for diversity, or with multi-specie blends, to lessen weather risks, break pest cycles and prevent erosion that some monoculture species are vulnerable to.

3 Use test plots

A cover crop test plot on your farm is the best way to really know how cover crops work for you. Have a check strip adjacent to your test plots to show a comparison to help determine benefits.

4 Plan ahead

It's simple: improved cover crops equal improved cash crops. Be prepared. Know your planting window. Have your seed available, equipment calibrated, and your workers prepared to plant.

5 On-farm testing & research

Collaborate with others, including Cover Crop Solutions, to replicate field scale research testing to give credible data for the real world. Follow up with a field day to show your neighbors and encourage what could work best for your area.

6 Follow a plan

Be strategic in determining which species to plant in front of the next cash crop. Generally legumes before corn and grasses before beans. Tillage Radish® can be planted before both, and TillageMax Blends are becoming more popular. Consider adding wheat on a few acres or short season corn or soybeans to expand planting window opportunities.

7 Record keeping

As with cash crops, keep a record of cover crop planting dates, seeding rates, and other important details. Incorporate this information into your crop management programs: crop consulting, conservation plans, fertility, soil testing, yield testing, moisture and nutrient availability data. Make notes comparing soil quality, harvestability, and any issues that may need to be addressed.

8 Spread out harvest

Make more of your fields available for cover cropping. Consider planting short season hybrids and varieties, planting wheat, or including grazing in your rotation.

9 Fertility management

Legumes can add nitrogen while Tillage RootMax™ Deep Root Annual Ryegrass and Tillage Radish can keep nitrogen from leaching into tile lines and groundwater. These cover crops can be a tool for nutrient management planning and for increasing soil biological activity.

10 Utilize your best resources

Seek knowledgeable Cover Crop Solutions seed dealers, university extension teams, NRCS personnel and websites that provide credible cover crop information. Challenge yourself, your hired hands and the next generation in finding ways to incorporate cover cropping into your operation!



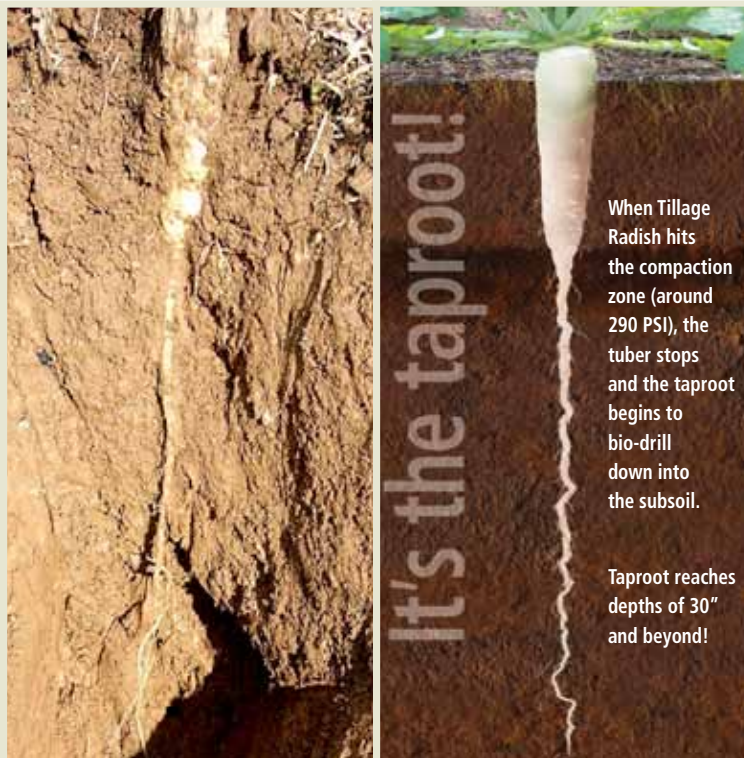
The Original and Only

The superior genetics of the Tillage Radish® cover crop are the secret weapons behind the dependable, consistent results and measurable benefits to the farmer, the soil, and the environment.

Visit our dedicated website: TillageRadish.com

KEY BENEFITS

- Increases yields and profits
- Scavenges nutrients, especially nitrogen
- Reduces soil compaction
- Suppresses weed growth
- Enhances seed bed
- Reduces inputs
- Helps control nematodes
- Genetically superior Tillage Radish is backed by 10+ years university and on-farm R&D... ***no other radish comes close to this extensive testing!***



It's the taproot!

When Tillage Radish hits the compaction zone (around 290 PSI), the tuber stops and the taproot begins to bio-drill down into the subsoil.

Taproot reaches depths of 30" and beyond!

- Corn yields up average **12 bu/ac**
- Soybean yields up **8 bu/ac**
- Winter Wheat yields up to **5-7 bu/ac** increase*
- Over 10 years of university R&D
- Tillage Radish® is genetically superior

**This is planting 2-3 lbs of Tillage Radish with winter wheat.*

EXTREMELY RAPID GERMINATION AND GROWTH

- Germinates in 2 to 3 days if adequate moisture is available
- Foliage spreads out to fill the given space and shade out weeds
- The tuber and thick foliage are the storehouse for vital nutrients
- Grows to a height of 12-24" depending on when it was planted

BIOACTIVE PLANT CHEMICALS (GLUCOSINOLATES)

- Studies show Tillage Radish increases the soil's bacteriophages who feed on nematodes and increases the (N) cycling process mineralizing available (N), (P), (Ca) and (S)
- Weed-suppressive effect helps shade out competition
- High levels of the compound glucosinolate and when decomposed, produces isothiocyanate (ITC) which has fungicidal, nematicidal properties. Some studies say it can also help inhibit weed seed germination

LARGE, DEEPLY PENETRATING TAPROOT

- Pulls up nutrients, allows increase water infiltration, establishes a root trail for the next crop, stores water in the soil profile
- The Tillage Radish's bio-drilling taproot forms when soil compaction reaches around 290 psi, boring into the subsoil to wick up nutrients
- Taproot has been reported to go 30 inches and beyond

WINTERKILLS & QUICKLY DECOMPOSING RESIDUES

- Usually after three nights with temperatures in the mid-teens
- Residue is very sparse at planting time
- Low (C)/(N) ratio making for a fast mineralization
- Releases stored nutrients when next crop needs it (April-June)

HIGH NUTRIENT (N, P, Ca, S, B) CONTENT

- A nutrient scavenger taking up nutrients throughout soil profile
- A Calcium film is left on the soil surface as part of decomposition
- Sulfur is concentrated in the roots and gives off an odor when decomposing, just like the additive mercaptan that is added to natural gas.
- Tillage Radish mineralizes available (N), (P), (Ca) and (S)
- Tillage Radish pulls up twice the amount of (Ca) than cereal rye

Source: Forage Radish Cover Crop Effects on Mycorrhizal Colonization & Phosphorus Soil Test. Charles Macaulay White, Master of Science, 2009.



Tillage Radish Growth Stages



1. Rapid Germination

2-3 days with proper soil temperature and moisture

2. Weed Suppression

Thick foliage shades out available space

3. Bio-Drilling Taproot

Tuber narrows at compaction point, sending out the taproot, boring down into the subsoil up to 30" in depth

4. Nutrient Silos

Enlarged tubers and thick foliage stockpile nutrients wicked up through the bio-drilling taproot

5. Winterkill

Dies after 2-3 nights in the mid-teens, leaving a blanket of winter cover

6. Seedbed Ready

Residue has decayed, nutrients are available, and soil health and seeding conditions are enhanced

PLANTING TIPS & SEEDING RATE

Precision Planter (4 lbs/acre): 15" rows using 60-cell small milo or sugar beet plates with 4" in-row spacing. Seed is selected for Precision Planting performance.



Scan code for additional planting information

Drill Seeder (6 lbs/acre): Using small grass box, use alfalfa setting as a guide to set seeding rate.

A large seed box can be used but the setting is very low and somewhat difficult to establish. Use Alfalfa as comparable seed on drill charts, reducing by 10%. It's important to calibrate your drill to determine correct seeding rate.

Broadcast/Aerial Seeding (8-10 lbs/acre): Strive for good soil and moisture contact (If fields are moist, fly seeds on. If fields are dry, push seeds in); Corn seeding indicator is when 1" patches of sunlight on soil surface are seen or approximately 4 weeks prior to anticipated harvest time; Soybean seeding indicator is at leaf yellowing; Cotton seeding indicator is right before defoliation; Improve success rate by using drop tubes when seeding with a high clearance cover crop seeder.

Nitrogen: To reach peak potential, needs 40-60 lbs of N, residual or applied.

Planting: Plant 3-10 weeks prior to the first killing frost. Green growth starts in less than a week in normal conditions; radish size depends on growth time, plant competition and available nutrients to scavenge.

Planting Depth: 1/4 to 1/2 inch deep. Can be planted 1" in light soils if necessary to reach moisture.

Seeding Rate:

- **Drilling:** 6 lbs/acre
- **Broadcast / Aerial:** 8-10 lbs/acre
- **Precision Planting (15" with 4" in-row):** 4 lbs/acre

Control: Tillage Radish winterkills with 3 nights in the mid-teens. If no killing frost, control with mowing, grazing or burndown of one quart of glyphosate with one pint of 2,4-D equivalent at flowering.



Visit our dedicated website: RootMax.com

The only certified annual ryegrass developed especially for cover crops and superior forage quality

Tillage RootMax™ is a different kind of annual ryegrass. It's been developed and tested as a superior annual ryegrass (ARG) for cover crop and forage applications. Here are some of the differences you'll see with certified Tillage RootMax Deep Root Annual Ryegrass.

- You have three more weeks to burn down Tillage RootMax than other varieties.
- The preferred late 'heading out' is a big help when fields are wet in the spring and conditions require greater flexibility for the herbicide application.

1 Certified uniformity

Tillage RootMax has outstanding uniformity at emergence and throughout growth and maturity, which makes it totally different than other annual ryegrass varieties. In the spring Tillage RootMax has significantly more top leaf tiller growth than other ARG varieties. Plant energy is designed to be directed to the roots, resulting in a much deeper root zone.



2 Easier control

Where some ARG varieties cause problems in the spring by irregular growth and early heading out, requiring more than one control treatment, Tillage RootMax is much more suited to farming practices where efficiency and productivity are critical. The easier control that Tillage RootMax provides is based on a combination of shorter and more desired dense leaf tillering, uniform growth, and preferred later maturity.

The common control is applying one quart of glyphosate before jointing in spring. Best burndown is achieved spraying on a warm day between 9 am - 4 pm with water adjusted to 5.5 ph.

3 Deeper root mass, better soil structure

The fine root mass of Tillage RootMax grow especially deep to build soil structure through the addition of organic matter, opening of macro pore spaces, introduction of air and water to deeper layers in the soil profile, enhanced soil biological activity, increased water infiltration and water holding capacity after control, and better soil particle aggregation. It all adds up to healthier soil that supports crop growth while reducing input requirements.

4 Later maturity – a certified advantage

- Compared to other ARG varieties, Tillage RootMax is easier to control in the spring.
- You have at least three more weeks of denser tiller leaf growth.

5 Excellent nitrogen (N) scavenging

This is why most farmers look to annual ryegrass (ARG) to plant over winter to keep the soil covered, help improve soil structure, and store significant amounts of nutrients in addition to N.

What makes Tillage RootMax different is its noticeably deeper roots. That means it grows deeper in to the soil to extract and hold nutrients. At termination before row crops are planted, these nutrients are plant available, helping reduce input requirements.

6 Reduced soil loss

Soil erosion conditions are minimized when fields are effectively planted with Tillage RootMax as a cover crop, eliminating exposed soil that would otherwise become crusted and "sealed" when rain drops cause surface compaction on bare soil. Tillage RootMax also encourages water to infiltrate the soil profile instead of washing downstream. This cover also prevents wind blown particles from forming dust clouds.

7 Water management

Tillage RootMax planted as a cover crop is a simple way to improve water infiltration as a potential hedge against drought. Its dense top growth protects the soil from rain drop compaction, the exceptionally deep roots provide channels for water to infiltrate deeper than ever, and when terminated, the loosened channels left in the soil by its roots let cash crop roots grow deeper to get that stored moisture. Think of RootMax as a deeper, denser, underground moisture reservoir.

8 Research is showing other benefits

Current research on Tillage RootMax shows a significant reduction in soybean cyst nematode populations. Other research includes forage trials and winter hardiness. Meanwhile, Tillage RootMax has already set new standards by providing the needed benefits when planted as a cover crop and added value to your cover crop blends.

KEY BENEFITS

- Certified genetic purity
- Uniform stand maturity for easier burndown
- Very deep soil-building roots
- Late heading out, longer spring window
- Winter hardy
- Unique morphology
- High vegetative tillering
- Outstanding nutritional value
- Breaks up hardpan & compaction
- Scavenges nutrients, esp. nitrogen
- Speeds up transition to continuous no-till
- Increases crop yields and profits

GENETIC
Certified
PURITY

Tillage RootMax

MORE TILLERS DEEPER ROOTMASS



Deep Root Technology: Now Available After 13 Years in Development

Tillage RootMax™ Deep Root Annual Ryegrass is the only variety certified for genetic purity for use as a cover crop and forage. The certified genetic purity assures maximum performance of unique properties of this new annual ryegrass, including:

- Uniform emergence leads to more even growth
- Even growth makes for easier control in the spring; one trip in most cases
- Roots go deeper than most other annual ryegrass varieties
- Improved soil structure goes deeper in the soil profile, providing enhanced growing conditions for following cash crops
- Outstanding nutritional value for forage
- Excellent for grazing or haylage production

PLANTING TIPS & SEEDING RATE

Planting: Plant 3-10 weeks prior to the first killing frost

Seeding Depth: 3/8 - 0.5"

Comparable seed on Drill chart is Tall Fescue (reduce by 20%), Crested Wheat Grass (reduce by 10%), Annual Ryegrass

Seeding Rate:

- **Cover Crop by Drill (7.5" rows):** 12 lbs/acre
- **Broadcast / Aerial Seeding:** 15-18 lbs/acre
- **Forage by Drill or Broadcast:** 18-30 lbs/acre
- **Precision Planting (15" with 1.5" in-row):** 10 lbs/acre
(Kinze Brush Meter with Backing Plate - 60 Cell Milo Plate)

Control: Applying one quart of glyphosate before jointing in spring. Best burndown is achieved by spraying on a warm day between 9 am - 4 pm with water adjusted to 5.5 ph.

Visit RootMax.com for more helpful control tips and information.



Scan code for additional planting information



TillageMax BLENDS

High Performance Cover Crop
Blends Featuring Tillage Radish®

The new TillageMax Blends is a line of high performance cover crop and forage blends only from Cover Crop Solutions. Each blend delivers the benefits of Tillage Radish® with the superior characteristics of Tillage RootMax™ Deep Root Annual Ryegrass, CCS Crimson Clover and CCS Oats. More cover crop mixes and blends are coming soon that include CCS Sweet Blue Lupin, CCS Sunn Hemp and CCS Hairy Vetch.

KEY BENEFITS

- Increases yields and profits
- Improves soil health & fertility
- Scavenges nutrients, esp. nitrogen
- Reduces soil compaction
- Suppresses weed growth
- Enhances seed bed
- Reduces input
- Helps control nematodes

TillageMax Indy™ Blend

Tillage Radish® + Tillage RootMax™
+ CCS Crimson Clover

This 3-way blend provides a combination of deep soil tillage and yield benefits achieved only by Tillage Radish, the soil building improvements of Tillage RootMax and the nitrogen fixing advantages of CCS Crimson Clover for a high performance cover crop blend.



Tillage Radish Tillage RootMax Deep Root Annual Ryegrass CCS Crimson Clover

Planting: Plant 3-10 weeks prior to first killing frost

Seeding Depth: 0.25 - 1"

Comparable seed on Drill chart is Tall Fescue (reduce by 25%), Crested Wheat Grass (reduce by 15%), Annual Ryegrass

Seeding Rate:

- **Drilling:** 15 lbs/acre
- **Broadcast / Aerial:** 17-20 lbs/acre
- **Precision Planting (15" with 2" in-row):** 12 lbs/acre
(Kinze Brush Meter with Backing Plate - 60 Cell Milo Plate)

Control: Tillage Radish winterkills with 3 nights in the mid-teens. Tillage RootMax and CCS Crimson Clover require a burndown of one quart of glyphosate with one pint of 2,4-D. Best control is achieved spraying on a warm day between 9 am - 4 pm with water adjusted to 5.5 ph.

TillageMax Bristol™ Blend

Tillage Radish® + Tillage RootMax™

Tillage Radish breaks up soil compaction with its aggressive taproot, creating thick channels 30" or deeper. This nitrogen storage tank holds N and other nutrients over winter and releases them as needed by following cash crops. Tillage RootMax builds soil structure deeper than many other ARG varieties. In combination, this outstanding cover crop mixture provides added cover in the spring prior to control.



Tillage Radish Tillage RootMax Deep Root Annual Ryegrass

Planting: Plant 3-10 weeks prior to first killing frost

Seeding Depth: 0.25 - 1"

Comparable seed on Drill chart is Tall Fescue (reduce by 25%), Crested Wheat Grass (reduce by 15%), Annual Ryegrass

Seeding Rate:

- **Drilling:** 12 lbs/acre
- **Broadcast / Aerial:** 15-17 lbs/acre
- **Precision Planting (15" with 1.75" in-row):** 10 lbs/acre
(Kinze Brush Meter with Backing Plate - 60 Cell Milo Plate)

Control: Tillage Radish winterkills with 3 nights in the mid-teens. Tillage RootMax requires a burndown of one quart of glyphosate. Best control is achieved spraying on a warm day between 9 am - 4 pm with water adjusted to 5.5 ph. If Tillage Radish does not winterkill, add one pint of 2,4-D type herbicide.

TillageMax Daytona™ Blend

Tillage Radish® + CCS Crimson Clover

Tillage Radish is the only proven yield-boosting cover crop radish, and absorbs soil nitrogen and other key nutrients with its unique taproot that grows 30" and deeper. CCS Crimson Clover converts atmospheric nitrogen into plant available nitrogen, helping reduce fertilizer input while improving soil health by adding organic matter. Maximum nitrogen is achieved at first flower of CCS Crimson Clover. This is a high performance cover crop blend.



Tillage Radish CCS Crimson Clover

Planting: Plant 3-10 weeks prior to first killing frost

Seeding Depth: 0.25 - 1"

Comparable seed on Drill chart is Alfalfa. Small seed box can be used

Seeding Rate:

- **Drilling:** 10 lbs/acre
- **Broadcast / Aerial:** 13-15 lbs/acre
- **Precision Planting (15" with 1.5" in-row):** 8 lbs/acre
(Kinze Brush Meter with Backing Plate - 60 Cell Milo Plate)

Control: Tillage Radish winterkills with 3 nights in the mid-teens. CCS Crimson Clover can be controlled by a spring burndown of one pint of 2,4-D type herbicide along with one quart glyphosate.

TillageMax Dover™ Blend

Tillage Radish® + CCS Oats

Both excellent scavengers of N, this Tillage Radish and CCS Oats mix will grow rapidly in cool weather and is ideal for quick fall cover. Tillage Radish breaks up soil, even in the compaction zone, with its long, singular taproot to create thick channels 30" or deeper. This blend enhances seedbeds, provides more ground cover in spring, helps control erosion, works to control harmful nematodes, and will winterkill for easy spring management.



Tillage Radish CCS Oats

Planting: Plant 3-10 weeks prior to first killing frost

Seeding Depth: 0.5 - 1"

Comparable seed on Drill chart is Oats

Seeding Rate:

- **Drilling:** 25 lbs/acre
- **Broadcast / Aerial:** 30-45 lbs/acre
- **Precision Planting (15" with 5" in-row):** 20 lbs/acre
(Kinze Brush Meter with Backing Plate - 60 Cell Soybean Plate)

Control: Winterkills after 3 nights in the mid-teens. If Tillage Radish or CCS Oats does not winterkill, apply a combination of one pint of 2,4-D type herbicide along with one quart of glyphosate at flowering or heading.



Scan code for additional
planting information

For more information or to find a dealer, call or visit:
800-767-9441 CoverCropSolutions.com

Available only from dealers carrying cover crop seeds produced by Cover Crop Solutions