

## Cover Crop Job Sheet (340) Soil Health

Natural Resources Conservation Service (NRCS)

April 2015

Cereal rye, 2 legumes, brassica, roll down with herbicide

Producer Name: \_\_\_\_\_

Contract # \_\_\_\_\_

**INFORMATION ON THIS JOB SHEET IS CONSIDERED TO BE PART OF THE CONTRACT AND/OR CONSERVATION PLAN.**

### **Purpose**

This job sheet will be used to establish high biomass cereal rye, legume and brassica cover crop mixtures to improve soil health. These cover crop mixtures will be late summer/early fall planted and spring killed by roll down and herbicide. Cash crop will then be no-till planted into heavy rolled down cereal rye and legume residue. This system is designed to obtain maximum soil cover, improve the soil's physical, biological, and chemical properties, naturally cycle substantial amounts of nutrients (nitrogen), control weeds, limit soil erosion, limit runoff of fertilizers/chemicals, conserve moisture, etc. This system maintains soil cover and live roots at times when the field would otherwise be bare or fallow for more than 30 days.

### **Conditions Where Practice Applies**

Practice applies on all lands where landowners wish to improve soil quality, natural nutrient cycling, and provide vegetative cover for natural resource protection and improvement. This practice is specifically designed for landowners who want to go beyond soil loss tolerance (T) and increase the carbon content of their soil (C).

### **Establishment Specifications**

1. Plant species and seeding rates will be



according to **Table 1** provided on page 5 of this document. The information provided is also located in the KY Cover Crop Guidance document attached to the KY Cover Crop Standard in section IV of Kentucky's Field Office Technical Guide.

Soil health cover crop mixtures shall consist of cereal rye, two legumes and daikon radish. Cereal rye is the small grain of choice due to its surface biomass and root production. Eligible legume species are Austrian winter pea, crimson clover, hairy vetch, and red clover. Daikon radish is used for its ability to capture soil nitrogen and ability to bio-till the soil. **In situations where crop fields do not have compaction issues Daikon Radish may be left out of the cover crop mixture allowing extension of the seeding date to October 15<sup>th</sup> in all parts of Kentucky.**

2. Seed will conform to minimum state standards for purity, germination and other features. Commercially marketed seed in Kentucky meets these requirements. **Organic producers should ensure the use of organic seed when available. Contact State Organic Certifier for more information.**

3. Landowners may want to soil test to insure adequate fertility exists in applicable fields. It

should be noted that it is critical for soil pH to be brought into the appropriate range for the type of plants being grown before large amounts of biomass are added to the soil surface. Surface biomass buffers soil pH making it more difficult to adjust pH up or down.

### ***Seeding and Seedbed Preparation***

No-till establishment is the preferred method of seeding in a soil health system. Soil disturbance is minimal, thus also reducing weed competition and the risk of soil erosion.

**A complete no-till system for all plantings will be used throughout entire crop rotation. Example: All cover crops and cash crops will be no-tilled throughout rotation.**

**Important: Avoid planting when soil is wet since no-till may result in placing seed too deep.**

### ***Seeding Dates***

Cover crops must be sown no later than **September 30<sup>th</sup> West of Interstate 65**. Optimum dates for seeding this cover crop mixture (West of Interstate 65) are **September 1<sup>st</sup> through 20<sup>th</sup>**.

Cover crops must be sown no later than **September 15<sup>th</sup> East of Interstate 65**. Optimum dates for seeding this cover crop mixture (East of Interstate 65) are **August 15<sup>th</sup> through September 10<sup>th</sup>**.

**In situations where crop fields do not have compaction issues Daikon Radish may be left out of the cover crop mixture allowing extension of the seeding date to October 15<sup>th</sup> in all parts of Kentucky.**

### ***No-Till Seeding***

Care should be exercised to insure appropriate cover crop mixture seeding rates and seeding depths are obtained when using no-till drills or planters.

***Conventional Seeding (Only allowed on organic operations where no-till planting is not feasible.)***

The importance of a dry firm seedbed cannot be

over emphasized to ensure proper planting depth.

Seedbeds may be prepared by disking.

Once seedbed is prepared, broadcast seed, cultipack, harrow or roll the seeded area only once to ensure good seed to soil contact and the proper seeding depth.

### ***Aerial Seeding***

When using aerial seeding method seeding rates must be increased by at least 25% for all cover crop seed species to insure adequate cover crop stand. Optimum seeding dates for aerial seeding are from September 1<sup>st</sup> through 10<sup>th</sup> at all locations within Kentucky. (In extremely wet years where corn is being grown it is better to wait until corn dries up to the ear and opens canopy before aerial seeding.)

When possible, aerial seeding should be performed over top of an existing crop before leaves of the existing crop fall to the ground. (Example: Aerial seeding of cover crop over soybeans prior to fall of soybean foliage.)

### ***Operation and Maintenance***

Cover crops established for soil health improvement purposes should not be terminated prior to stage 10 of the attached Purdue University Extension Service, “Small Grain Growth Stages” document (see Insert 1).

If landowners desire crop insurance, the latest cover crops can be terminated is at or within 5 days after planting of cash crop but before cash crop emergence to be in compliance with Risk Management Agency insurance guidelines.

It is suggested to allow cover crop to grow to the day of planting cash crop at which time cover crop should be terminated. Nitrogen fixing cover crops allowed to grow until April 15<sup>th</sup> West of Interstate 65 and April 30<sup>th</sup> East of Interstate 65 can fix substantial quantities of nitrogen for cash crops resulting in significant reductions in commercial fertilizer usage.

It is recommended that cover crop mixtures be terminated by roll down in conjunction with a chemical burn down with all plant residues left on soil surface. **Organic producers should ensure the use of organically approved chemicals. Contact State Organic Certifier for more information.**

Roll down can be accomplished using roller crimpers, stalk choppers or cultipackers. Roller crimpers and stalk choppers are the preferred roll down implements due to their crimping abilities, which cultipackers do not have.

**The cover crop residue cannot be disked or plowed into the soil or disturbed with any other**

**full width tillage implement (e.g. Turbo-Till, Phoenix/Phillips Harrows, etc.)**

**Cover Crops CANNOT be harvested for grain, silage, or hay. All cover crop residue must be left on soil surface.**

Three to four years into rotation, landowners should obtain a biological soil test from a reputable soils lab. Two biological test that meet this criteria are a “Potentially Mineralizeable Nitrogen Test” or the “Haney Test”. These tests should be performed for each field to estimate the amount of N being released to cash crop from the soil microbial food web. Commercial N fertilizer should then be reduced accordingly.

## ***Insert 1: Purdue University Extension Service***

### **Small Grains Growth Stages**

#### *Stage 1*

3-Leaf Stage: The first two leaves are completely developed, and the middle, or third, leaf is partially developed.

#### *Stage 2*

The tillers (sometimes called side shoots) are beginning to form.

#### *Stage 3*

Tillers have formed and are in their primary growth stage.

#### *Stage 4*

Tillers have ended their growth and the leaf sheaths (the lower part of the leaf which surrounds the stem) begin to form.

#### *Stage 5*

Leaf sheaths are strongly erected and the stems formed start to grow in length.

#### *Stage 6*

One-Joint Stage: The first joint develops near the soil surface and can be felt inside the stem. The joints, or nodes, produce a swelled appearance in the lower portion of the stem.

#### *Stage 7*

Two-Joint Stage: The second joint has formed, marking the beginning of the reproductive phase.

#### *Stage 8*

Appearance of the last leaf.

#### *Stage 9*

Ligule Stage: The ligule (a membrane at the junction of the leaf sheath and leaf base) of the last leaf is fully developed, and the leaf sheath is swollen at the level of the capsuled head of grain.

#### *Stage 10 (Soil Health Cover Crops Should Not Be Terminated Until They Reach Stage 10 or After)*

"Boot" Stage: At this stage, the immature head of grain presses the rolled leaf sheath apart and becomes visible.

#### *Stage 10.1*

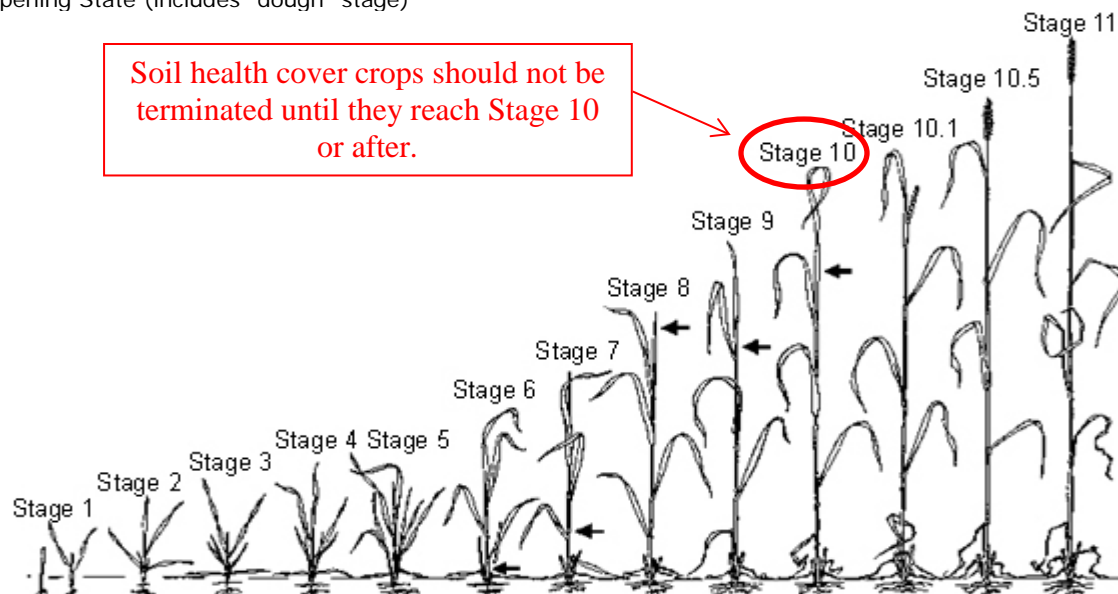
Head Emergence Stage

#### *Stage 10.5*

Flowering Stage

#### *Stage 11*

Ripening State (includes "dough" stage)



Producer Name: \_\_\_\_\_

Date: \_\_\_\_\_

Producer Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Table 1.** Species and seeding rates will be according to the information provided in the table below. If additional room is needed, make copies of this table and attach it to the back of job sheet.

Tract Number: \_\_\_\_\_

Field No.	Acres	Cover Crop Mixture Species	Lbs./Ac Seed	Total Lbs. Seed Required	Seeding Method (No-Till, Conventional, *Aerial)	Seeding Date

\*When aerial seeding cover crops or broadcasting without incorporation, seeding rates must be increased by 25%.

**Table 1. Soil Health Mixture Options and Dates:**

For counties west of I-65: Seeding dates: 9/1 through 9/30 (earlier is better)

For counties east of I-65: Seeding dates: 8/15 through 9/15 (earlier is better)

Example Cover Crop Mixture (“**Kentucky Cover Crop Guidance**” document, **Table 1**, cover crop **ID # 7**)

Cereal Rye – 35 lbs/ac

Crimson Clover – 10 lbs/ac

Austrian Winter Pea – 28 lbs/ac

\*Daikon Radish – 1.5 lbs/ac

\*It should be noted that if no compaction exists in crop field daikon radish may be left out of cover crop mixture and the seeding date extended to October 15<sup>th</sup> across the state.

See “**Kentucky Cover Crop Guidance**” document attached to the Cover Crop 340 Standard located in the FOTG, section IV, **Table 1**, cover crop **ID #’s: 6, 7, 8, 9, 10, and 11** for all eligible cover crop species mixtures for “Soil Health” cover crop.

NOTE: -Early September seeding dates are preferred.

-For maximum soil quality benefits, no-till seeding methods should be used throughout the rotation.

-Organic producers should contact the State Organic Certifier to ensure the use of organic materials.

(Seeding rates/dates were interpreted from University of Kentucky recommendations and guidelines, SARE Managing Cover Crops Profitably Manual, and recommendations of the USDA-NRCS East National Technical Support Center.)

## Certifications

Job Sheet	Prepared by:	Title:	Date:
	Approved by:	Title:	Date:
Installation	Meets NRCS standards and specifications.		
	Certification by:	Title:	Date:
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