

**CSP 2006 Enhancement**  
**On-Farm Demonstration and Data Collection Project**  
**Abstract**

**Nationally Defined Topical Area:** Soil Quality – on- farm demonstration, participatory conservation research, and data collection effort to confirm the economics of a soil quality practice of a novel cover cropping strategy for use in silage corn in the Northeast.

**Enhancement Title:** ESTABLISHING COVER CROPS AT TIME OF  
SILAGE CORN PLANTING

**Objectives:**

1. Demonstrate which species can be effectively, efficiently and economically established at time of corn planting.
2. Determine which currently registered herbicides or combinations can be used with the cover crops to effectively control the weeds while suppressing the cover crop while not damaging the corn crop.
3. Demonstrate different seeding methods that can be used.
4. Collect data to compare corn yields with and without the cover crop system.

**Contact Information:**

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**Background:**

Silage corn is one of the largest contributors to agricultural related soil degradation, runoff, soil erosion and water quality problems in the Northeast. Due to the cool moist weather in the Northeast no-till and other conservation tillage practices are lagging behind other regions of the country. Where implemented these practices are not as effective in silage corn due to the lack of residue. Existing cover cropping methods utilizing cereal grain is the only option and in many years is only marginally effective. This is due to the late corn planting dates sometimes encountered due to wet weather conditions in the spring, as well as cool summers resulting in late harvest dates resulting

in very late cover crop planting, if done at all, resulting in less than optimum cover going into the winter. This lack of protection is reflected in very modest reductions in soil loss as calculated by the RUSLE II equation. The establishment of cover crops at time of corn planting allows for the seeding of the cover crop early when there is good soil moisture conditions utilizing the seed bed prepared for the corn crop. The cover crops then benefit due to some early growth prior to corn canopy closure and for rapid growth following corn harvest. Row cultivation is not required to prepare a seedbed which is needed for conventional inter-seeding systems. The cover crops can be established using conventional seeding equipment allowing for uniform distribution and efficient use of seed (lower seeding rates and costs) resulting in better stands, or can be broadcast immediately following or during harrowing, or by conversion of insecticide boxes to drop seed at box level during the planting operation. This method is designed to be uncomplicated and to fit into existing operating procedures. The cover crop stands that can be produced by this method are far superior to past methods so that actual soil improvement, soil erosion reduction and water quality benefits may be actualized.

These trials will complement the research efforts at the Big Flats Plant Materials Center allowing for the testing of the most promising treatments on farms with different soils, climate and management systems. The interaction with farmers has proven to be the best way to transfer this technology to them as well as to learn from them ways to make the system more efficient.

**Applicable Technology:**

The establishment of cover crops during corn planting has been prevented by incompatibility with commonly used residual pre-emergence herbicides. Now with the use of post emergence, low volume imidazolinone, herbicides such as Pursuit and conventionally bred corn hybrids (IMI or Clearfield) resistant to them, this option is now possible. Herbicides are used to suppress the cover crops while controlling weeds without reducing corn yields. The establishment of cover crops at corn planting overcomes some of the barriers of previous cover crop establishment methods.

**Needs or Focus:**

This effort allows for the establishment of cover crops early using herbicides to suppress the cover crops so as to not compete with the corn. This early establishment allows for a cover crop which effectively reduces erosion and over time improves soil quality. This system allows for the establishment of legumes which can allow for nitrogen fixation in areas with low manure use or allow for the establishment of grasses other than cereal grain for nitrogen uptake and recycling. The use of perennial forage grass species reduces some of the management problems that are encountered with cereal rye if cultivation is delayed in the spring due to weather conditions and the cereal rye bolts growing rapidly to 4 ft. in height.

**The Proposal:**

CSP enhancement payments will be offered to willing CSP contracts participants who agree to establish demonstration plots and data collection on 10 acres of cropland for the purpose of demonstrating the practicality of establishing cover crops at time of corn silage planting.

## **Protocols and Requirements:**

The farmer will be willing to follow protocol procedures similar to those in (Appendix 1). The farmer will fit the field, plant the corn and fertilize as per his normal operating procedure. The farmer will apply or have a custom applicator apply the herbicides as per protocol, there could be up to two different herbicide treatments. The farmer will plant the cover crop there could be up to two different cover crops applied and a control without cover crops. There could be up to two different cover crop seeding methods tested. A zone-till system will also be evaluated. The farmer will work with a crop consultant to measure corn silage yields and cover crop density and biomass on these plots. The cover crop will be measured in the fall in the last week of November and in the spring prior to tillage or burn down with herbicides. The cover crops will be measured with a transect method, digital photography methods and small biomass plots. The farmer will be willing to host a farm field day to help demonstrate this system to other farmers in the CSP watershed.

## **Payment Proposal:**

Establishment of plots and data collection \$4,000.00 per year  
Demonstration Field Day \$1,000.00 per year

## **Appendix 1**

### **Establishing Cover Crops at time of Corn Planting**

Cover cropping is a practice with many benefits. It can reduce erosion, recycle and fix nitrogen and improve soil and water quality. The establishment of cover crops following corn silage harvest is limited due to the short growing season for growing corn and the onset of winter following corn harvest. This time constraint also limits your choices of cover crops to just winter cereal grains. Cover crops have been successfully established at time of corn planting using conventionally bred corn hybrids tolerant of Imidazolinone herbicides. These herbicides can be used to inhibit the growth of the cover crop while controlling the weeds so as to not compete with the corn. If you are interested in participating in this project by establishing 10 acres to demonstrate this technique on your farm or for more information please contact Paul Salon at (315) 477-6535.

#### Method #1:

Conventionally till with final pass with harrow

Plant cover crop with drill, Brillion or broadcasting prior to soil surface crusting, cultipacking if needed

Plant corn as usual (IMI corn i.e. Pursuit Resistant, Clearfield corn hybrids)

Spray **pre-emergence** mix of Pursuit (1.44 oz/ac) and Python (.5 oz/ac) or low recommended rate of Hornet or Callisto (6 oz/ac) use Callisto pre-emergence on grass

only 3 oz. of Dual or 1 pint of prowl can be used for grasses with the Callisto to increase cover crop suppression and improve weed control.

Method #2:

Conventionally till with final pass with harrow

Plant cover crop with drill, Brillion or broadcast cultipacking if soil surface is crusted

Plant corn as usual (IMI corn i.e. Pursuit Resistant, Clearfield corn hybrids)

Spray **post emergence** mix of Pursuit (1.44 oz/ac) and other herbicide following label dependent on **CC** and **weeds** (i.e. Buctril, Basagran, Python, Permit, Banvel, Callisto etc.) use nitrogen and surfactant

Method # 3:

Conventionally till with final pass with harrow

Spray Eradicane (5 pints/ac) + Python (1.0 oz/ac) mix **pre-plant incorporated**, follow-up with post-emergence legume tolerant herbicide if needed (**not for grass cc**)

Incorporate Eradicane 3-4 inch deep criss-cross if possible (do not use Eradicane on grass cc)

Seed cover crop with drill, Brillion or broadcast cultipacking if soil surface is crusted

Plant normal corn hybrid as usual

Cover crops: **Note: it is important not to over apply seed planters need to be calibrated!!**

Red clover 10 lbs/ac do not use Callisto on red clover pre or post

Dutch white clover 6 lbs/ac

Perennial ryegrass or other cool season grass 6-8 lbs/ac (Pursuit + Callisto Pre) (not with Eradicane)

Red clover + White Clover or alfalfa 6 + 4 lbs/ac ea.

Red clover + PRG 6 + 4 lbs/ac ea.

These guidelines are not a substitute for pesticide labeling. Read the label before applying any pesticide. Trade names given for convenience only. No endorsement of products is intended nor is criticism of unnamed products implied.