USDA—Natural Resources Conservation Service

CSP-Conservation Stewardship Program

Red Clover Cover Crop

A CSP On-Farm Pilot Project

Producers have hardly used leguminous plants such as red clover as cover crops. With the increased costs of nitrogen fertilizer, and the concern about the fossil energy use of our farming systems (nitrogen fertilizer represents on average 30% of energy needs of modern cropping systems) nitrogen-fixing cover crops could play a major role in supplying the nutrient needs of the crops in a crop rotation.

This Pilot Project

is a Conservation Stewardship Program (CSP) enhancement and consists of the planting, monitoring and publicizing of the results obtained.

The project will last two years and requires the grow of red clover in at least one acre of land. The producer will conduct three events to publicize the project to other producers.

Start Date

The pilot project needs to be scheduled to start within the first three years of the CSP contract.

Participant Share

The participant is responsible for all aspects of implementation of the project.

Red Clover- On a demonstration project conducted in Pennsylvania red clover was the most successful legume specie.

The United States Department of Agriculture (USDA) is an equal opportunity provider and employer.

Preliminary Results of Red Clover as a Cover Crop

As part of a demonstration project conducted by the Pennsylvania State University (PSU) and the USDA-Natural Resources Conservation Service (NRCS), over 800 acres of red clover were frost seeded into living small grain crops (primarily wheat) in March/April and in the fall. Partial budget analysis showed that the net revenue of wheat and frost-seeded red clover was similar to that of corn. The farmer would harvest wheat straw (1 ton/ac @ $100/ton) and grain ($60 bu/ac @ $6/bu), and harvest one cutting of red clover hay in the fall (2ton/ac @ $60/ton). Net revenue of this package exceeded $200 per acre. Red clover biomass at time of termination in the spring ranged from 0 (stand failure) to 1.9 ton DM/ac, and nitrogen content was around 4%. Typically, the biomass was 1 ton DM/ac. As long as fairly uniform red clover stand was obtained, the nitrogen fertilizer recommendation for the following corn crop was reduced by 50 lbs N/ac compared to the same scenario without cover crop. The establishment method is not fool-proof and can result in poor stands, but because establishment was low-cost and because of the potential forage value, farmers were very interested in this package.

Planting Recommendations

If frost seeding, the red clover should be established in late winter (Feb-Apr). If planting in the fall, the red clover can be broadcast, established with a Brillion seeder, or with a no-till drill. The seeding rate should be 10 lbs/A or higher. The cover crop seed should be inoculated with the appropriate rhizobium bacteria if red clover has not been in the rotation for more than five years.

The producer is encouraged to control summer annual weeds in the field if there are many weeds coming through. This can be done by mowing the stand in the summer. Mowing red clover actually stimulates its growth, so it is a plus for the red clover.

For the CSP project producers will note the percent of establishment obtained (0-25%-50%-75%-100% cover). This measurement should be taken in the fall. Since this system is usually part of a winter small grain crop, it would be after harvest of the small grain. They will also note if they harvested any haylage from the field or grazed it in the fall – and how many tons/A. Another measure the farmer needs to collect is the height of the cover crop in the fall and in the spring of the year after establishment.

For guidance on how to implement the practice contact Sjoerd Duiker, Department of Crop and Soil Sciences, The Pennsylvania State University, 814-863-7637.

For the implementation of the practice the producer may use financial assistance coming from sources other than USDA programs.

If you have questions regarding the Conservation Stewardship Program (CSP) please call the county USDA–Natural Resources Conservation Service office .