Cover Crop Overview and Management

GENERAL INFORMATION

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INTRODUCTION

Using cover crops in farming systems is not a new practice. Prior to the development of manufactured fertilizers, cover crops were commonly used to improve soil structure and productivity. Recent economical and environmental concerns have fueled a resurgence in cover crop use. This information sheet is the first in a series designed to provide cover crop information A team of researchers, MSU Extension agents and Michigan farmers are producing them to address specific cover crop questions. The information comes from research and demonstrations conducted at Michigan State University and on farms throughout Michigan.

Cover crops are planted to improve soil quality - not for harvest and resale. They enhance soils by protecting, improving and providing nutrients and have many purposes, including:

***Nitrogen management*:** Cover crops can enhance N production and/or reduce leaching. Overseed legume (clovers, medic, etc.) cover into corn, frost seed into wheat, or late summer seed to provide nitrogen for future crops. Grass (annual rye grass, cereal rye, wheat, oil seed radish) can be used to take up excess nitrogen and reduce the potential for groundwater leaching.

***Erosion control*:** Cover crops can be used to reduce wind and water erosion. Maintaining ground cover through fall, winter and early spring drastically reduces soil loss.

***Improving soil quality*:** Cover crops enhance soil structure while increasing soil biota activity. They reduce soil compaction while increasing water percolation and retention. Cover crops help soils maintain a higher organic matter level than continuous row cropping without cover. They also improve soil aggregation, infiltration and bulk density.

***Weed suppression*:** Cover crops can play a role in managing weeds by shading and interfering with weed germination and establishment. Cereal rye produces allelochemicals which suppress weeds. Unfortunately, cover crops can also become weeds. (MSU researchers are currently investigating using cover crops for weed control without reducing crop yields).

***Insect management*:** Cover crops will play an important role in future biological insect control. They have increased Trichograma wasp survival for European corn borer control in seed corn. MSU researchers are investigating using cover crops for biological control programs, however, very little information is currently available.

Pastures: Cover crops can be used as a forage crop and feed source.

There are many other uses for cover crops which will be discovered as we increase their use.

COVER CROPS MANAGEMENT GUIDELINES

ESTABLISHMENT:

Overseeding: seeding a cover crop into a growing row crop between rows. Example: crimson clover seeded into corn at corn growth stage V-6.

Frost seeding: seeding a cover crop into an established crop in late winter to very early spring. Example: seeding red clover into wheat in March.

Drilling or spreading: cover crops can be drilled or spread into crop residue following crop harvest. Drilling works best with larger-seeded varieties, while small seeded cover crops can be established either by drilling or broadcasting. Example: cereal rye following potato harvest.

Aerial: cover crops can be seeded aerially before crop harvest. Example: wheat seeded into soybean prior to leaf drop.

CONTROL:

Once a cover crop is established, farmers need to prepare to manage it for the following crop. Cover crops can act as weeds if not controlled. Controlling cover crops in no-till systems is more difficult and less predictable and chemical control may be warranted. Legumes may be killed at flowering by flailing or mowing. It is critical that cover crops be controlled in spring to prevent them from interfering with the row crop. Control is especially important during a dry spring.

Cultural: several cover crop species cannot survive Michigan winters. These cover crops will die over the winter (winter kill) without the need for mechanical or chemical control. Examples: oats, Berseem clover, oilseed radish and annual medics.
Mechanical: Traditionally, farmers moldboard plowed to control cover crops. This is a very effective means of control, although some grass species (annual ryegrass, cereal rye) can cause rapid soil drying and plowing becomes very difficult if it is not done early. Unfortunately, reduced tillage systems often will not provide complete cover crop control.
Chemical: The two herbicides that seem to fit best for control of cover crops are 2, 4-D ester and Roundup. To maximize chemical control, it is extremely important to time the herbicide application to the correct growth stage of the cover crop. A herbicide recommendation chart is available for controlling cover crops.

For more information, contact Dale Mutch or Todd Martin at Michigan State University's W. K. Kellogg Biological Station Land and Water Program, 3700 E. Gull Lake Dr., Hickory Corners, Mich. 49060-9516. Or call them at 800-521-2619.