

Cover Crops Can Provide Numerous Benefits to Your Vegetable Production System

The use of cover crops in a vegetable production system can provide numerous benefits, even in the first year such crops are included in a cropping system. These benefits can continue to increase over the years due to substantial improvements in the fertility and tilth of the soil, as well as a substantial reduction in soil erosion. I want to point out some of the more important, tangible benefits that cover crops can provide to vegetable cropping system, and point out two very useful, inexpensive resources that are available to help interested growers get started.

Buckwheat cover crop in a potato cropping system



Improvement in Soil Fertility. A number of cover crop species are excellent in terms of contributing nitrogen to the soil. Legume cover crops, such as hairy vetch, medium red clover, and alfalfa are well known for large contributions to soil N, which then can be available for a cash crop that follows the legume. Other cover crops, especially fibrous-rooted cereal grains, are particularly effective at scavenging excess nutrients, especially N, left in the soil after a cash crop harvest.

Reduction in Use of Pesticides. Many different cover crops are effective in suppressing weeds. This suppressive effect is achieved in a variety of ways. The cover crop can act as a smother crop that outcompetes weedy species for water and nutrients. Cover crop residue or a growing cover crop leaf canopy can block light, alter the light frequencies, and change soil surface temperatures, all of which can inhibit establishment and growth of weeds. Some cover crops produce root exudates or other chemicals that have natural herbicidal effects. Cover crops can also provide a hospitable environment for beneficial microbial life that can discourage plant diseases, and can create a soil environment that lessens the occurrence of soilborne diseases. Resources provided by cover crop plants, such as pollen and nectar, are helpful in attracting and retaining pollinators, and also beneficial insects such as predatory and parasitic species that attack and control pest insects and mites on crops. Certain cover crops also produce chemicals that reduce populations of pest nematodes, and cover crops can increase numbers and diversity of beneficial nematode species.

Mixed Cover Crop Planting



Yield Improvement Due to Enhanced Soil Health. Cover crops can improve soil health by speeding up infiltration of excess surface water, relieving compaction and improving structure of

overtilled soil, adding organic matter that encourages beneficial soil organisms, and enhancing nutrient cycling.

Reduction in Soil Erosion. Cover crops that grow rapidly will hold soil in place, reduce the degree of soil crusting, and reduce the amount of soil erosion by wind and rain. The aboveground plant structures of cover crops also protect soil from rain drop impacts. If cover crops are used over long time periods, water infiltration is increased and runoff, which can quickly remove soil from a field, is reduced considerably.

Conservation of Soil Moisture. When cover crops are killed and the plant residue is left on the soil surface, water infiltration into the soil is increased and evaporation is reduced, which reduces the amount of moisture stress during droughts. If cover crops are lightly incorporated into the soil, they capture surface moisture and add organic matter. These factors lead to increased water infiltration to the root zones of plants. Types of crops that exhibit exceptional soil covering ability are grass type covers such as rye, wheat, and the sorghum-sudan grass hybrid.

Protection of Water Quality. Cover crops slow erosion and reduce runoff, thereby decreasing the amount of nonpoint source pollution due to sediment, nutrients, and pesticides. The uptake of excess soil N also keeps nitrogen from leaching into the groundwater.

I hope I have made a convincing case for the use of cover crops in vegetable production systems. Two excellent resources that provide details on cover crops and soil improvement can be obtained on the Sustainable Agriculture Research and Education Bookstore website: <http://www.sare.org/webstore.htm>. The two books are “Managing Cover Crops Profitably”, 3rd edition (\$19), and “Building Soils for Better Crops,” 2nd edition, by Fred Magdoff and Harold van Es (\$19.95). Both of these books will provide you with a strong background on cover crops and help you get started using these valuable plants in your own vegetable production system.

