The utilization of cover crops, and specifically cover crops as green manure, is an effective method of retaining and/or fixing nutrients, as well as introducing organic matter into the soil. Cover crops are also an organic and sustainable alternative to commercial or synthetic fertilizers, which are not options when considering organic certification. In a dryland cropping system they do utilize some moisture which can impact crop yields in the following year.

Definitions

When discussing cover crops and green manures, it is important to draw the specific distinction between the two terms. Essentially, cover crops are intended to provide soil cover, and the potential benefits include weed suppression, erosion control, and, in the case of legumes, nitrogen fixation. Green manures are cover crops that are incorporated into the soil, either while green or soon after flowering, with the intent of improving the soil.

In addition to green manures, there are other types of cover crops with specific benefits. A living mulch cover crop may be incorporated in between the rows of a perennial cash crop such as an orchard or vineyard to suppress weeds and provide traction for equipment.
Benefits of Green Manures

Green manures can improve the nutrient content of the soil once incorporated. For example, 40 to 60% of the total nitrogen content of a legume will be available to a crop following green manure crop being tilled under. Additionally, macronutrients such as phosphorus and calcium will slowly become available as well as the incorporated green manure decomposes. A particular lush green manure crop will rapidly increase the presence of soil microorganisms, which will in turn make nutrients available more quickly due to the accelerated breakdown of plan material.

This process also has a beneficial effect on soil structure. As decomposition of green manure occurs, compounds that are resistant to breaking down are left to bind soil particles together to form granules and aggregates. This process makes for an easily tillable, aerated soil.

Types of Green Manure Cover Crops

As previously mentioned, legumes are a sensible choice of cover crop that will be incorporated as green manure due to their nitrogen fixating properties. Choices include peas, vetches, and forages such as annual sweet clover or soda of alfalfa—these are especially desirable if there is a livestock component to the operation as they can be grazed or bailed prior to being incorporated.

A recent organic dryland cropping systems study by Oregon State University utilized Austrian peas as a cover crop/green manure during fallow. One benefit of peas as a green manure is they are fairly shallow rooted and short seasoned.

References


