Solano RCD

Agricultural Water Quality
Best Management Practices

Annual Winter Cover Crops

What they are

In an annual cropping system, cover crops are a non-cash crop planted in the off-season when fields are otherwise fallow.

Typical species include annual vetches, clovers, grains, or other grasses. Cover crops can be planted as a single species or as a species mix.

How they work

Winter Cover crop roots anchor soils throughout the winter and allow rain to penetrate, enhancing infiltration and reducing runoff and associated scour and erosion. The plants also provide "cover" for the soil, intercepting raindrops and diffusing energy before they hit the ground.

Cover crops help trap sediments and agri-chemicals attached to sediment and take up dissolved nutrients from surface runoff. Increased soil infiltration increases the opportunity for pesticides to break down on site.

As the plants and roots break down, they contribute organic matter and nutrients to the soil.

Benefits

Cover crops:

- Boost soil fertility and improve soil tilth, structure, and water-holding capacity, depending on soil type.
- Promote beneficial soil organisms, including certain bacteria, fungi, and earthworms.
- Capture and recycle soil nutrients. Legumes can also "fix" additional nitrogen from the atmosphere and make it available to other plants.
- Reduce erosion and stabilize soil.
- Increase water infiltration and prevent the formation of crusts on the soil surface.
- Reduce the amount and intensity of runoff water. Storm runoff can be reduced by as much as 90% in fall-planted cover cropped beds.

Cover Crop Benefits, continued

- Improve runoff water quality. Sediment concentration in runoff water can be reduced between 30 – 45%.
- Suppress weeds by covering bare areas.
- Provide habitat for wildlife and beneficial insects.
- Some cover crops can be harvested for forage hay or bedding mulch.

Establishment and Management

The choice of what cover crop to use will depend on the desired benefits, planting schedule, costs, water needs, soil characteristics, problematic diseases and pests, and equipment availability.

Establishing cover crops is similar to any other planting project.

In the fall, light discing or another form of tillage and smoothing are used to prepare the seedbed. For planting, seed can be drilled in or broadcast. Recommended seeding rates will depend on the type of seed used, ranging from 15 or 20 pounds per acre for clovers and grasses to as much as 50 or 60 pounds per acre for large-seeded varieties of legumes and vetches. For legumes, inoculation with rhizobial bacteria may be needed.

Prior to planting the cash crop in the spring, the cover crop is usually "knocked down" with mowing, discing, or herbicide and incorporated into the soil. After the cover crop has time to break down—usually at least two weeks—the soil surface may be reshaped and smoothed as needed. In some cases, cover crops can be cut back and incorporated into the soil in one operation, with just a couple passes of equipment such as a power incorporator.

Cost

The costs to establish and maintain a cover crop are seed purchase, ground preparation and planting, mowing or discing, and incorporating the cover crop into the soil.

Annual Cover Crops

For an annual cover crop mix of clover and vetch, seed cost may be around $30 -$50 per acre.

Grain or annual grass seed may cost between $20 -$40 per acre.

Ground preparation and planting costs can range from $30 - $60 per acre.

Costs to mow or disc and incorporate the cover crop can range from $30 - $60 per acre.

These costs may be defrayed in part or completely by associated increases in yield, as observed in processing tomato field studies in Yolo County between 1997-2000.

Planning and available financial support

Advice on establishing cover crops is available through the Resource Conservation District, Natural Resources Conservation Service and University of California Cooperative Extension. The UC Sustainable Agriculture Research and Education Program (SAREP) has an excellent cover crop page on the world wide web located at http://www.sarep.ucdavis.edu/ccrop/. RCD, NRCS and UCCE staff is available to answer questions about the optimum type of cover crop to plant, when to plant it, seeding rates, and how it should be managed.

Financial assistance for implementing this practice is available through:

The Yolo-Solano Agricultural Water Quality Management Support Program can reimburse the costs of materials and time. Reimbursement amounts will be determined on a site by site basis.

The Environmental Quality Incentive Program (EQIP) provides cost-sharing for private land conservation practices.

Crimson Clover *Trifolium incarnatum*

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