United States Department of Agriculture
Natural Resources Conservation Service

2013 Ranking Period 1

Soil Quality Enhancement Activity – SQL11 –Cover cropping in orchards, vineyards and other woody perennial horticultural crops

Enhancement Description
Grow perennial or annual cover crop mixtures of grass, legumes, native flowering plants and/or other forbs year round to provide soil coverage, organic mulch, beneficial insect habitat, and other conservation benefits in orchards, vineyards or other perennial horticultural crops. Cover crops, once planted, are replanted annually or maintained year after year.

Land Use Applicability
Cropland

Benefits
Maintaining orchard and vineyard floors or row middles of perennial horticultural crops with continuous cover protects the soil resource from erosion, enhances soil quality, reduces compaction and rutting from field operations, and suppresses weeds. Cover crops provide habitat for pollinators and natural enemies of crop pests, fix nitrogen (legumes), and conserve moisture via organic mulch and suppress weeds.

Conditions Where Enhancement Applies
This enhancement only applies to acres of orchards, vineyards, and other woody perennial cropping systems.

Criteria
1. Plant cover crops in the inter-row spaces to be compatible with optimum yield and quality of the fruit crop. Grow cover crops on a minimum of 60% of the field area year annually. When annual cover crops are used, plant each succeeding cover crop within as soon as possible after termination of the preceding cover. Residue from the previous cover crop must be left on the soil surface until immediately before the next cover crop is planted.
2. Areas near crop rows or young, establishing trees that must be kept free from competing vegetations shall be maintained with organic mulch to control erosion, conserve soil moisture, and sustain soil quality. Select mulching material, application rate, and placement compatible with needs of the production crop. Total soil coverage (living cover + mulch) shall be maintained at a minimum of 85% of the field area. Replenish mulch as needed. Exception: In lieu of using mulch to meet the 85% minimum requirement, the area beyond the 60% minimum shall be seeded to a cover crop for systems where the mulching material would hinder harvest operations.
3. Select and seed cover crop mixtures at rates and within planting date ranges as determined or agreed to by the NRCS State Agronomist. Perennial mixtures must consist of at least two

species from different plant families. Annual cover crops must include at least three species from a minimum of two different plant families.

4. Select a mixtures and sequence of cover crop species to accomplish two or more of the following objectives:
   a. High biomass and root mass to build soil organic matter. Expect at least 2 tons/ac of aboveground biomass annually.
   b. Biologically fixed nitrogen for the production crop. Choose a mixture that will provide sufficient but not excessive amounts of N to the crop. Schedule mowing or termination of the cover to optimize rate and timing of N release for crop needs. Leave clippings near crop rows for desired N delivery.
   c. Mulch generation. Plant mixtures which can be cut periodically to generate mulch material for application to crop rows or areas not protected by living cover.
   d. Weed suppression. Select covers that establish rapidly form a heavy canopy and suppress weeds without competing excessively with the production crop. Schedule mowing of perennial covers to optimize weed control and prevent weed propagation.
   e. Habitat for beneficial insects. Select a mixture of flowering plants based on the habitat needs of key predators or parasitoids to control the most economically important pests of the crop to be protected.
   f. Pollinator habitat. Select a mixture of flowering plants to provide food and habitat for desired pollinators. Time mowing and other management operations to minimize competition for pollinators while the fruit crop is blooming.

Adoption Requirements

This enhancement is considered adopted when cover crop mixture are established and total ground coverage (living cover + organic mulch) reaches 85% of the field area.

Documentation Requirements

1. Cover crop species mix, planting dates, mowing dates and (for annual species) termination dates and methods.
2. Pattern and layout of production and cover crops plus mulch used to document how soil coverage criteria were reached.
3. The accomplished items from “Criteria #4.”
4. Photographs of representative fields showing cover crops added to the rotation, timing and method of cover crop establishment, and cover crop management.
5. Seed and legume inoculant tags and receipts.

References

Ames, G. K., G. Kuepper, and A. Baier. 2004. Tree Fruits: Organic Production Overview. National Sustainable Agriculture Information Service. http://attra.ncat.org.

Dufour, R. 2006. Grapes: Organic Production. National Sustainable Agriculture Information Service. pp 44. http://attra.ncat.org

Hinman, T., and G. Ames. 2001. Apples: Organic Production Guide. National Sustainable Agriculture Information Service. pp 40. http://attra.ncat.org

Kuepper, G. L., S. Diver, K. Adam, M. Guerena, and P. Sullivan. 2004. Blueberries: Organic Production. National Sustainable Agriculture Information Service. pp 26. http://attra.ncat.org

Kuepper, G.L., H. Born, and J. Bachman. 2003. Organic Culture of Bramble Fruits. National Sustainable Agriculture Information Service. pp 20. http://attra.ncat.org

USDA Sustainable Agriculture Research and Education (SARE) Handbook Series Book 9. Managing Cover Crops Profitably, 3rd Ed. http://www.sare.org.

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Reference:

- ***340 – Cover Crop***
- ***328 Conservation Crop Rotation***
- ***Midwest Cover Crops Council Decision Tool***
- ***Managing Cover Crops Profitably, 3rd Edition***

Supplemental Minnesota Criteria

See Cover Crop (340) Practice Standard and supporting documents for more information on seeding. Consult the References listed above for more cover crop seeding options.

Approved Cover Crops:

SPECIES	NITROGEN-SOURCE	SOIL BUILDER	EROSION FIGHTER	WEED FIGHTER	NITROGEN SCAVENGER	QUICK GROWTH	LASTING RESIDUE	GRAIN/SEED HARVEST VALUE	INTERSEED WITH CASH CROP	GRAZING	FORAGE HARVEST VALUE
NON LEGUMES											
SPRING BARLEY	0	3	3	3	3	3	3	0	4	3	2
WINTER BARLY	0	3	4	3	4	3	4	4	3	3	2
BUCKWHEAT	0	2	2	3	3	4	0	3	0	2	0
FLAX	0	1	1	0	2	1	4	0	0	1	0
FOXTAIL MILLET	0	3	3	3	3	4	3	0	0	2	2
JAPANESE MILLET	0	3	3	3	3	4	3	0	0	3	2
PEARL MILLET	0	3	3	3	3	4	3	0	0	4	2
PROSO MILLET	0	3	3	3	3	4	3	0	0	3	2
OATS	0	3	3	2	3	4	2	1	4	4	3
WINTER CEREAL RYE	0	4	4	4	4	4	4	4	4	4	3
ANNUAL RYEGRASS	0	3	3	2	3	3	3	1	3	4	3
SORGHUM-SUDANGRASS	0	4	3	4	4	4	4	0	0	3	4

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SUDANGRASS	0	4	3	4	4	4	4	0	0	4	4
WINTER TRITICALE	0	3	4	3	4	3	4	4	4	4	3
SPRING WHEAT	0	3	3	2	3	3	3	1	4	3	3
WINTER WHEAT	0	3	4	3	4	3	4	4	4	4	3
BRASSICAS											
RADISH (oilseed or forage)	0	3	2	3	3	4	0	0	2	3	0
RAPESEED/CANOLA	0	2	2	2	3	3	1	2	0	0	1
FORAGE-TYPE TURNIP	0	2	2	2	3	2	1	0	2	4	1
LEGUMES											
ALFALFA	4	3	4	2	4	2	2	1	2	4	4
BERSEEM CLOVER	4	3	3	2	2	1	2	0	4	4	3
CRIMSON CLOVER	3	3	2	2	2	2	2	0	4	2	3
RED CLOVER	4	3	4	3	3	3	2	3	3	4	3
WHITE CLOVER	2	3	3	2	2	1	1	0	4	3	3
COWPEA	3	2	2	2	1	2	1	0	0	3	2
FIELD/WINTER PEA	2	2	2	1	2	3	1	2	2	2	3
SOYBEANS	2	2	0	2	2	2	2	2	0	2	2
SWEETCLOVER	3	3	3	2	2	2	3	2	2	1	1
HAIRY VETCH	4	2	2	2	2	1	1	0	2	0	1
MIXES											
50%HV/50% WC RYE	2	3	4	3	3	2	3	0	0	0	1
50% W. PEA/50%OSR	2	3	2	2	2	3	1	0	2	2	0
60% A RYEGRASS/40% OSR	0	3	2	2	3	3	2	0	0	3	0
60%CR CL/40%A RYEGRASS	2	3	2	2	2	2	2	0	0	4	3
60% CR CLOVER/40% OATS	2	3	2	2	2	3	2	0	0	4	3
60%OATS/40% OSR	0	3	2	2	3	4	1	0	0	3	0

ATTRIBUTE RATINGS: 0=POOR, 1= FAIR, 2=GOOD, 3=VERY GOOD, 4=EXCELLENT

ALL INFORMATION FROM MIDWEST COVER CROPS COUNCIL WEBSITE FEBRUARY 2013
http://www.mccc.msu.edu/index.htm

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