

Plant Enhancement Activity – PLT20 –High residue cover crop or mixtures of high residue cover crops for weed suppression and soil health



Enhancement Description

Utilize biomass from a cover crop or cover crop mixture as a living or killed mulch to suppress weed seed germination and to add carbon to the terrestrial carbon pool.

Land Use Applicability

Cropland

Benefits

Cover crop or cover crop mixtures when managed properly can physically and/or chemically control weeds. Physically, a live cover crop competes with weeds for water, nutrients and sunlight. A killed cover crop physically prevents the germination of weed seed by changing the micro environment around the weed seed (temperature and light). Chemically, certain legume, cereal or brassica cover crops suppress weed seed germination and seedling development via plant-produced natural herbicides upon decomposition (i.e., allelopathy). By implementing this enhancement, the major resource concerns of soil quality, soil erosion, plants and water quality will be improved and maintained to a high level.

Conditions Where Enhancement Applies

This enhancement applies to all acres of annually planted cropland. These acres can be organic, transitioning to organic, or non-organic.

Criteria

1. Between each crop in the rotation, except double cropped situations, seed a high residue cover crop or mixture of high residue cover crops. Each cover crop or mixture shall meet the following requirements:
 - a. Seed a cover crop or cover crop mixture at a rate and within a planting date range as determined or agreed to by the NRCS State Agronomist.
 - b. Cereal grain cover crops or mixtures shall be top dressed with nitrogen at rates determined or agreed to by the NRCS State Agronomist.
 - c. The cover crop or mixture shall reach a maturity level (i.e., growth stage) to ensure 100% soil coverage in the row middles for 3 months of the growing season. For example, cereal rye shall reach the soft dough stage before termination. The NRCS State Agronomist can determine a specified maturity level or desired residue quantity (dry matter basis) for the selected cover crop cultivar.
 - d. Termination of all cover crops shall be accomplished by chemical methods, non-chemical methods (such as flail mowing or roller crimper), or a combination of both.



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2013 Ranking Period 1

2. The crop rotation must be grown in a manner to maintain a minimum Soil Tillage Intensity Rating (STIR) ≤ 10 as determined by RUSLE2.

Adoption Requirements

This enhancement is considered adopted when all of the criteria have been met on the land use acre.

Documentation Requirements

Written documentation for each year of this enhancement describing the following items:

1. Cover crop or mixture used
2. Cover crop or mixture seeding rate and seeding date
3. If applicable, nitrogen top dress rate and date for the cover crop or mixture
4. Cover crop or mixture termination stage
5. Method used to terminate cover crop or mixture and date of termination

References

Price, A.J., K.S. Balkcom, L.M. Duzy and J.A. Keltron. 2012. Herbicide and Cover Crop Residue Integration for *Amaranthus* Control in Conservation Agriculture Cotton and Implications for Resistance Management. Weed Technology. In press.

Price, A.J., K.S. Balkcom, R.L. Raper, C.D. Monks, R.M. Barentine, and K.V. Iversen. 2008. Controlling Glyphosate-Resistant Pigweed in Conservation Tillage Cotton Systems. Conservation Systems Research. Special Publication No. 09. USDA-ARS-NSDL, Auburn, AL.

Sustainable Agriculture Research and Education (SARE). 2010. Managing Cover Crops Profitably. 3rd ed. Handbook #9. College Park, MD.

CSP 2013-1
State Supplement
PLT 20

MS-ECS-340-01 (JS)
Cover and Green Manure Crop (Ac.)

Species	Seeding Date	Seed/lb	Pure Stand Seeding Rates		Proportional Seeding Rates for Mixtures				Planting Depth (Inches)	Fert (lbs/ac) N-P-K
		(x 1000)	(seeds/ft)	(lb/A)	3/4	1/2	1/3	1/4		
		lb/A								
Suggested Cover Crops for Recycling Nutrients										
Cover crop species will be selected for their ability to take up large amounts of nutrients from the rooting profile of the s										
Oats	Sept.-Nov.	15	20	60-120	49	33	22	16	1	80-40-80
Oilseed Radish	Sept.-Nov.	140	19	6	4.5	3	2	1.5	1/2	60-40-60
Sorghum/Sudan Grass	April-June	28	13	20	15	10	7	5	1	120-40-80
Cereal Rye	Sept.-Nov.	18	18	60-120	49	33	22	16	1	80-40-80
Winter Wheat	Sept.-Nov.	15	40	60-120	60	40	27	15	1	80-40-80
Pearl Millet	April-June	82	30	25	19	13	8	6	1/2	120-40-80
Suggested Cover Crops for Fixing Nitrogen										
1. Only Legume or Legume-grass mixtures will be established as cover crops										
2. Legume seed will be inoculated with the appropriate rhizobium bacteria										
Alfalfa (annual)	Sept.-Nov.	227	80	15	12	8	5	4	1/2	0-80-200
Alsike Clover - Ladino Clover	Sept.-Nov.	700-800	50	4	3	2	1.3	1	1/2	0-80-200
Austrian Winter Pea	Sept.-Nov.	18	14	35	26	17	11.5	9	1	0-80-80
Hairy Vetch	Sept.-Nov.	20	6	25	9	6	4	3	1	0-80-80
Red Clover	Sept.-Nov.	275	51	8	6	4	2.5	2	1/4	0-80-200
Soybeans	April-June	4	5	45	34	4	15	11	1	0-80-80
Arrowleaf Clover	Sept.-Nov.	400	50	8	6	4	2.5	2	1/2	0-80-200
Crimson Clover	Sept.-Nov.	150	50	25	19	13	8	6	1/4	0-80-200
Suggested Cover Crops for High Residue										
1. Termination of high residue crops shall be accomplished by chemical methods, non-chemical methods (such as flail mower or) a combination of both.										
Sorghum/Sudan Grass	April-June	28	13	20	15	10	7	5	1	120-40-80
Cereal Rye	Sept.-Nov.	18	18	60-120	49	33	22	16	1	80-40-80
Winter Wheat	Sept.-Nov.	15	40	60-120	60	40	27	15	1	80-40-80
Pearl Millet	April-June	82	30	30	19	13	8	6	1/2	120-40-80
Suggested Deep Rooted Cover Crops for Soil Compaction										
1. Legume seed will be inoculated with the appropriate rhizobium bacteria										
Alfalfa (annual)	Sept.-Nov.	227	80	15	12	8	5	4	1/2	0-80-200
Alsike Clover - Ladino Clover	Sept.-Nov.	700-800	50	4	3	2	1.3	1	1/2	0-80-80
Austrian Winter Pea	Sept.-Nov.	18	14	35	26	17	11.5	9	1	0-80-80
Hairy Vetch	Sept.-Nov.	20	6	12	9	6	4	3	1	0-80-80
Red Clover	Sept.-Nov.	275	51	8	6	4	2.5	2	1/4	0-80-80
Soybeans	April-June	4	5	45	34	4	15	11	1	0-80-80
Arrowleaf Clover	Sept.-Nov.	400	50	8	6	4	2.5	2	1/2	0-80-80
Crimson Clover	Sept.-Nov.	150	50	25	19	13	8	6	1/4	0-80-80
Oilseed Radish	Sept.-Nov.	140	19	6	4.5	3	2	1.5	1/2	60-40-60
Brassicas	Sept.-Nov.	190	13	3	0	0	0	1	1/2	60-40-60
Ryegrass	Sept.-Nov.	228	84	25-40	15	10	7	5	1/2	180-80-20
Suggested Cover Crops for Additional Forage										
1. Species will have desired forage traits and not interfere with production of subsequent crop.										
2. Forage provided by cover crop may be hayed or grazed as long as sufficient biomass is left for resource protection.										
Oats	Sept.-Nov.	15	20	60-120	49	33	22	16	1	80-40-80
Oilseed Radish	Sept.-Nov.	140	19	6	4.5	3	2	1.5	1/2	60-40-60
Sorghum/Sudan Grass	April-June	28	13	35	0	0	0	0	1	120-40-80
Cereal Rye	Sept.-Nov.	18	18	60-120	0	0	0	0	1	80-40-80
Winter Wheat	Sept.-Nov.	15	40	60-120	0	0	0	0	1	80-40-80
Pearl Millet	April-June	82	30	30	0	0	0	0	1/2	120-40-80
Brassicas	Sept.-Nov.	190	13	3	0	0	0	1	1/2	60-40-60
Ryegrass	Sept.-Nov.	228	84	25-40	18	12	8	6	1/2	180-80-20