Cover Crops

Conservation Design Sheet ***340***

Natural Resources Conservation Service (NRCS) **January 2000**

WHAT ARE COVER CROPS?

Grasses, legumes, forbs, or other herbaceous plants established for seasonal cover and conservation purposes. Cover crops reduce erosion by water or wind by disrupting the impact of raindrops and the stinging forces of wind blown soil particles. Cover crops with lots of above ground growth in a season can help increase soil organic matter. Cover crops can capture and recycle excess nutrients like free nitrogen in the soil profile. Legume cover crops can be inter-seeded during the growing season to fix nitrogen for the next year's crop. Some cover crops can attract beneficial insects and provide over-wintering sites for the next year. Because of the potential allelopathic effect of weed seedlings, rye and ryegrass cover crops can suppress weed populations. In addition, cover crops can increase available soil moisture by providing insulating mulch if at least a 50 percent or more cover is maintained after planting.

CONSIDERATIONS

Consider potential herbicide carryover when selecting the species of the cover crop. Of the cover crops, rye is most tolerant of triazine carryover, followed by wheat, then oats, and lastly legumes. Legumes are extremely sensitive to triazine carryover released by liming low pH soils. Delay seeding legumes for one year if more than 1 lb. of triazine was used the previous year.

Cereal rye and oil seed radish are more effective in utilizing excess nitrogen remaining from the previous crop.

Cereal rye will grow longer in the fall and begin growth earlier in the spring than wheat.

Aerial seeded cover crops into soybeans; especially wheat, rye, and oats; are best if seeded prior to soybean leaf drop.

Aerial seeding of oats into soybeans (seeded prior to harvest) can add additional residue cover without the need to kill the cover crop the following spring.

Aerial seeded wheat or cereal rye into corn is best if seeded during the early dent stage. This generally occurs the last week of August to mid-September.

Consider grass cover crops when a legume, like soybeans, is planned following the cover crop.

Consider legume cover or a green manure crop when a grass crop, like corn, is planned the following year.

Hairy Vetch can serve as a host to the Soybean Cyst Nematode (SCN). Consider alternative cover crops when SCN is a concern in the rotation. The following plants are reported to be host plants for SCN: henbit, common mullen, wild mustard, chickweed, pokeweed, canola, purple deadnettle, shepards purse, and field pennycress (report from Ohio). *Caution - Hairy Vetch can also be a weed in future wheat*.

Aerial seeded and early no-till established cover crops provide more erosion control the year of establishment.

It is not recommended to plant mustards on the same field for more than two years in a row. Oil seed radish may be susceptible to clubroot disease or cabbage root maggot and should not be used in a rotation with vegetable crops susceptible to these pests.

Cover crops sown using conventional tillage for seedbed preparation after mid-October can cause more erosion during the establishment year than if a cover crop was not planted.

Consider cover crops after corn silage to reduce soil erosion, replace organic matter losses, and capture nitrogen where manure is fall applied.

To obtain maximum erosion control from cover crops after soybeans or corn, allow them to mature to the specified height per the criteria for erosion control. No-till and mulch till complement the use of cover crops.

Crops planted late enough in spring to allow sufficient growth of cover crops are: dry beans, soybeans, sweet corn, snap beans, cabbage, cucumbers, tomatoes, and late potatoes.

Inter-seed cover crops at the last weed control cultivation in: corn, cabbage, cauliflower, peppers, or eggplant. Inter-seed into snap beans 10 days before the first harvest of beans.

Sow cover crops after harvesting the following crops: corn silage, dry beans, cucumbers, early soybeans, early corn, beets, spinach, carrots, lettuce, and potatoes.

Early planted crops such as carrots, beets, direct seeded cabbage, and early potatoes do not allow sufficient growth of cover crops in spring.

OPERATION, MANAGEMENT, AND MAINTENANCE

When seeding legumes, ensure the proper inoculant is used at planting time. It is best to inoculate just prior to planting.

Establish the cover and green manure crop within the recommended planting dates and try to achieve the desired growth stage. In a dry spring, it may require an early termination to prevent further moisture depletion in the seedbed and affect crop germination.

Fertilize a green manure/cover crop in the spring with a high nitrogen fertilizer for maximum growth ahead of planting a high nitrogen-demanding vegetable crop. The recovery of the nitrogen applied to a green manure crop will amount to about 40 percent for the first vegetable crop.

Caution must be used when broadcasting or aerial seeding treated seed into a crop that is standing (to yet be harvested). Treated seed could show up in the harvested grain and result in rejection.

Burn-down, chop, mow, or till to kill cover crops when planting corn prior to corn emergence. Cover crops such as rye can produce an allelopathic effect that can slow the germination and growth of corn and other competition. It is best to kill the grass cover about a week prior to planting the corn.

COVER CROP SPECIFICATIONS 340

Farm _____ Field(s) _____ Tract _____ Date _____

Crop Rotation _____ Current Crop _____ Next Crop _____

REQUIREMENTS

Purpose: __ Reduce Erosion; __ Increase Organic Matter; __ Capture Nutrients;

__ Fix Nitrogen; __ Weed Suppression; __ Pest Suppression;

__ Soil Moisture Conservation; __Other (specify) _____

Seedbed Preparation	Fertilizer
_____	_____
_____	_____
_____	_____
_____	_____

Field No.	Recommended Plant Species	Recommended Rates	Seeding Depth	Seeding Dates

Planting Method by Cover Crop

TABLE 1 – COVER CROP SPECIES

Purpose BD – Bio Diversity EC – Erosion Control EN – Excessive Nutrients NF – Nitrogen Fixation OM – Organic Matter SF – Supplemental Forage SM – Soil Moisture Mgt. WS – Weed or Pest Suppression								Cover Crop Species	Life Cycle	Nitrogen Value (lb/Ac)	Seeding Rate (lb/Ac)	Seeding Depth (inches)	Frost Seed March – mid-April	Direct Drill or Broadcast and Shallow Till May 1 – mid-June	Overseed Corn @ Vegetative Stage V4-V8 Early June – Early July	Overseed Corn by Air or Highboy Early August – mid- Sept.	Overseed Corn by Air or Highboy Late/mid-Sept. – mid-Oct.	Overseed at Leaf Drop Mid-August – mid-Sept.	Seed Post-Harvest Mid-July – Sept. 1
BD	EC	EN	NF	OM	SF	SM	WS	***Legumes***											
	x		x	x	x		x	Annual medic	SA	40-100	10-39	¼-½			X			NR	
	x		x	x	x			Berseem clover	SA	60-90	9-20	¼-½			X			NR	X
	x		x	x	x		x	Crimson clover	SA	50-60	12-20	¼-½						X	X
	x		x	x	x			Field peas	SA	30-100	70-150	1-2							
	x		x	x			x	Hairy vetch	WA	60-180	25-40	½-2	X		X	X		X	X
x	x		x	x	x		x	Mammoth red clover	B	60-70	8-15	¼-½			X	X		X	X
x		x	x	x	x		x	Sweetclover	B	70-90	8-15	¼-½			X	X		X	X
x		x	x	x	x			Alfalfa	P	50-150	9-25	¼-½							
x	x		x		x			White clover	P	60-100	5-7	¼-½			X	X		X	X
	x	x	x	x	x			Medium red clover	P	60-70	10-15	¼-½	X		X	X		X	X
	x		x					Alsike clover	B/P	60-70	4-10	¼-½							
			x					Birdsfoot trefoil	P	40-100	5-10	¼-½							
x	x	x	x	x				60/40 mix (RC/SC)	B/P	60-90	8-15	¼-½	X		X	X		X	
			x		x			Soybeans	SA	0-40	1 Bu	1-2		X					X
x	x		x	x	x	x		Crownvetch	P	50-100	3-10	¼		X					
								Non-Legumes											
x		x					x	Buckwheat	SA	NA	36-60	¼-½			X	X		NR	NR
	x	x		x	x	x	x	Corn	SA	NA	1 Bu	1 ½		X					
	x			x		x	x	Field Bromegrass	SA	NA	10	¼		X	X				
	x	x			x			Forage turnips	SA	NA	3-5	¼-½							X
x	x				x	x		Oats	SA	NA	34-68	1-2				X		X	X
	x	x		x	x	x	x	Oilseed radish	SA	NA	15-25	¼-½				X		X	X
		x					x	Rape	SA	NA	3-8	¼-½						X	X
	x	x		x	x	x	x	Sudan Grass	SA	NA	20-25	½-1		X					X
	x	x		x	x	x		Annual ryegrass	AW	NA	15-25	¼-½			X	X			X
	x			x	x			Barley	AW	NA	48-96	1-2					X		X
x	x	x		x	x	x	x	Cereal Rye	AW	NA	28-112	½-1					X	X	
x	x	x		x		x	x	Triticale	AW	NA	60-120	½-1					X	X	X
x	x	x		x	x		x	Wheat	AW	NA	60-120	½-1					X	X	X