USDA United States Department of Agriculture

Natural Resources Conservation Service
Des Moines, Iowa

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Prevented Plant Risks and Options

Suggested cover crops and seeding rates to help Iowa farmers achieve their prevented planting goals

Prevent Plant Benefits

Prolonged rain and flooding have resulted in many fields that will go unplanted this year. Producers in this situation need to weigh not only their program and insurance options ("prevented planting") but should also their agronomic options to ensure long-term productivity from this difficult situation.

Leaving the soil bare all summer poses many environmental and agronomic risks. Producers should explore the benefits of planting a cover crop that has the potential to

- capture applied nutrients
- fix nitrogen
- build organic matter
- control weeds
- reduce erosion
- improve soil health and biology during the remainder of the growing season
- add plant diversity
- build rotational yield potential for following crops

Prevent Plant Considerations

Soil Erosion by Water: If the field area being planned is on sloping land, significant water erosion can occur if a cover crop is not established. Establishment of a cover crop with at least 50% of the mix constituted with grass species is recommended. Seed a cover crop as early in the summer as feasible. Select species that will provide lasting surface residue through winter/early spring.

Soil Erosion by Wind: Regardless of slope, fields with ponded water for an extended time or tilled and subjected to repeated heavy rain events will become crusted and prone to wind erosion. Seed a cover crop as early in the summer as possible.

Fallow Syndrome: Living organisms in the soil are critical for proper plant growth and development. Many of these organisms rely on root exudates from living roots to thrive. Research and experience have shown significant potential for reduced vigor in a crop following an extended period

in which soil is maintained with no living roots/growing plants. This is likely to occur in prevented plant acres if no vegetation is established. Cover crop establishment should occur anytime during the summer, but the earlier it is established the more benefit the cover crop will provide.

Soil Organic Matter: Soil organic carbon is either retained or lost on every acre every year. If the soil is bare, with no living plant growing, more soil carbon is lost than retained. Current research indicates a direct correlation between increases in retained soil organic carbon and increases in root exudates. Increases in soil organic carbon also have a direct correlation to internal soil drainage and plant available water. Soil organic carbon can be maintained (or increased) by keeping diverse vegetative cover on the land to capture more solar energy, which leads to more root exudate and biomass production.

Seed production: Many cover crop species planted early to mid-summer have the likelihood of completing their lifecycle and producing seed. This can create a weed concern for the subsequent crop. Mowing or terminating the cover crop prior to seed production is recommended.

Corn is planned next year: If you plan to plant corn next year, select cover crop mixes with legumes to provide biological nitrogen for the corn crop. This will allow reduced inputs the following year. If purchased soybean seed is treated and cannot be returned, using the

soybeans as a cover crop along with additional legumes will provide the greatest benefit. Make sure to inoculate any legumes with proper rhizobium bacteria to insure nodulation. If erosion is a concern, add a fibrous root species. Sunn hemp, Cowpeas, Buckwheat, Sudangrass, and millets are excellent choices in mid-summer. Clovers, vetch, and cereal grains are excellent choices late summer/early fall.

Soybeans planned next year: If you plan to plant soybeans next year, use a cover crop mix dominated with grass and brassica species to utilize residual nitrogen. Excess nitrogen available in the soil profile reduces soybean nodulation, which can lead to the soybeans running out of nitrogen late season. Millets, Sorghum-Sudangrass, and buckwheat are excellent choices for early to mid-summer seedings. Brassicas, cereal grains, and annual ryegrass are excellent choices for late summer/early fall.

Suggested Cover Crop Seeding Rates for Prevented Planting

Warm Season Grasses

Species	Full Seeding Rate[1]	Overwinter	Seeding Timeframe
Corn	40 Drilled (80,000 seeds/ac) 60 Broadcast (incorporate treated seed)	No	5/1 - 8/1
Forage Sorghum	25 Drilled 32 Broadcast	No	5/15 - 8/1
Millet (Japanese, Pearl, Proso, Foxtail)	20 Drilled 25 Broadcast	No	5/15 - 8/1
Sorghum-Sudangrass	25 Drilled 32 Broadcast	No	5/15 - 8/1
Sudangrass	25 Drilled 32 Broadcast	No	5/15 - 8/1
Teff	6 Drilled 7 Broadcast	No	5/15 - 8/1

Warm Season Broadleaf

Species	Full Seeding Rate[1]	Overwinter	Seeding Timeframe	
[2]Alfalfa (Perennial)	6 Drilled 8 Broadcast	[4]Normally	4/1 - 6/1	8/1 - [6]Zone NWH Date
Buckwheat	45 Drilled 60 Broadcast	No	5/15 - 8/15	
[2]Cowpeas	30 Drilled 38 Broadcast (needs incorporated)	No	5/15 - 8/1	
[2]Guar	5 Drilled 7 Broadcast	No	5/15 - 8/1	
[2]Mung Bean	15 Drilled 18 Broadcast	No	5/15 - 8/1	
[2]Soybeans	30 Drilled 38 Broadcast (needs incorporated)	No	5/1 - 8/1	
Sunflower (Black Oil)	5 Drilled 8 Broadcast (25% max in mix)	No	5/15 - 8/15	
[2]Sunn Hemp	8 Drilled 10 Broadcast	No	5/15 - 8/15	

Suggested Cover Crop Seeding Rates for Prevented Planting

Cool Season Grasses

Species	Full Seeding Rate[1]	Overwinter	Seeding Timeframe	
Annual Ryegrass	12 Drilled 14 Broadcast	Normally	4/1 - 5/15	7/15 - [6]Zone NWH Date
Cereal Rye	45 Drilled 45 Broadcast	Normally	8/1 - [7]Zone WH Date	
Spring Barley	60 Drilled 60 Broadcast	Unlikely	4/1 - 6/1	8/1 - [6]Zone NWH Date
Spring Oats (Including Black Oats)	60 Drilled 60 Broadcast	Unlikely	4/1 - 6/1	8/1 - [6]Zone NWH Date
Spring Wheat	60 Drilled 60 Broadcast	Unlikely	4/1 - 6/1	8/1 - [6]Zone NWH Date
Triticale	45 Drilled 45 Broadcast	Normally	8/1 - [7]Zone WH Date	
Winter Barley	60 Drilled 60 Broadcast	Unlikely	8/1 - [6]Zone NWH Date	
Winter Wheat	45 Drilled 45 Broadcast	Normally	8/1 - [7]Zone WH Date	

Cool Season Broadleaf

Species	Full Seeding Rate[1]	Overwinter	Seeding Timeframe	
African Cabbage	8 Drilled 8 Broadcast	Possibly	4/1 - 5/15	8/1 - [6]Zone NWH Date
[2]Austrian Winter Pea	30 Drilled 38 Broadcast (needs incorporated)	[5]Possibly	8/1 - [6]Zone NWH Date	
[2]Balansa Clover	6 Drilled 8 Broadcast	[4]Normally	4/1 - 6/1	7/15 - [6]Zone NWH Date
[2]Berseem Clover	8 Drilled 12 Broadcast	No	4/1 - 6/1	8/1 - [6]Zone NWH Date
[2]Chickling Vetch	40 Drilled 50 Broadcast	Unlikely	4/1 - 6/1	8/1 - [6]Zone NWH Date
[2,3]Common Vetch	15 Drilled 18 Broadcast	[4]Probably	4/1 - 6/1	8/1 - [6]Zone NWH Date
[2]Crimson Clover	10 Drilled 15 Broadcast	[4]Possibly	5/1 - 6/1	8/1 - [6]Zone NWH Date
[2]Field/Forage Pea	30 Drilled 38 Broadcast (needs incorporated)	Unlikely	4/1 - 5/15	8/1 - [6]Zone NWH Date
Flax	30 Drilled 30 Broadcast	Unlikely	4/1 - 5/15	8/1 - [6]Zone NWH Date
[2,3]Hairy Vetch	12 Drilled 14 Broadcast	[4]Normally	4/1 - 6/1	8/1 - [6]Zone NWH Date
Kale (Includes Collards)	6 Drilled 8 Broadcast	Possibly	4/1 - 5/15	7/15 - [6]Zone NWH Date
[2]Ladino/White Clover (Perennial)	5 Drilled 7 Broadcast	[4]Normally	4/1 - 6/1	8/1 - [6]Zone NWH Date
[2]Lentil	12 Drilled 15 Broadcast	Unlikely	4/1 - 5/15	7/15 - [6]Zone NWH Date

Suggested Cover Crop Seeding Rates for Prevented Planting

Cool Season Broadleaf Cont...

Species	Full Seeding Rate[1]	Overwinter	Seeding Timeframe	
Mustard	3 Drilled 4 Broadcast	Unlikely	4/1 - 5/15	8/1 - [6]ZoneNWH Date
Phacelia	6 Drilled 8 Broadcast	Possibly	4/1 - 5/15	8/1 - [6]ZoneNWH Date
Radish	5 Drilled 6 Broadcast	Unlikely	4/1 - 5/15	8/1 - [6]ZoneNWH Date
Rapeseed (Includes Canola)	3 Drilled 4 Broadcast	[4]Probably	4/1 - 5/15	8/1 - [6]ZoneNWH Date
[2]Red Clover (Perennial)	8 Drilled 10 Broadcast	[4]Normally	4/1 - 6/1	8/1 - [6]Zone NWH Date
[2,3]Sweetclover	6 Drilled 8 Broadcast	[4]Normally	4/1 - 6/1	8/1 - [6]Zone NWH Date
Turnip	3 Drilled 4 Broadcast	No	4/1 - 5/15	7/15 - [6]Zone NWH Date
[2,3]Woolypod Vetch	12 Drilled 14 Broadcast	[4]Probably	4/1 - 6/1	8/1 - [6]Zone NWH Date

1 - Use guidance from Iowa Technical Note 38 for seed quality.
2 - Denotes legumes. Apply appropriate inoculant at plant to ensure proper nodulation.
3 - Hard Seed. May germinate following year.
4 - Planting 40 days priort to frost increases likelihood of overwintering.
5 - Sustained temperatures below 18º for extended time without snow cover reduces winter survivability.
6 - Zone NWH Date = Iowa Technical Note 38 Zone date for seeding Non-Winter Hardy Species.
7 - Zone WH Date = Iowa Technical Note 38 Zone date for seeding Winter Hardy Species.

Suggested Cover Crop Mixes for Prevented Planting

Planting Date: June 1 - July 15

Species Mix	% of Stand	Drilled	Broadcast	Comments
Sorghum-Sudangrass Sunn Hemp Buckwheat	50 25 25	12.5 2 11.25	16 2.5 11.25	Ahead of Corn or Soybeans Non-Winter Hardy Mix
Sunflower Sunn Hemp Cowpeas Buckwheat	25 25 25 25	1.25 2 7.5 11.25	2 2.5 9.5 15	Ahead of Corn Non-Winter Hardy Mix
Cowpeas Woolypod Vetch Millet	25 25 50	7.5 3 10	9.5 3.5 12.5	Ahead of Corn Non-Winter Hardy Mix
Sorghum-Sudangrass Buckwheat Millet	20 40 40	5 18 8	6.5 24 10	Ahead of Soybeans Non-Winter Hardy Mix

Suggested Cover Crop Mixes for Prevented Planting

Planting Date: July 15 - August 15

Species Mix	% of Stand	Drilled	Broadcast	Comments
Sudangrass Radish Sunn Hemp Buckwheat Sunflower	35 20 15 15 15	8.75 1 1.25 6.75 0.75	11.25 1.25 1.5 9 1.25	Ahead of Corn or Soybeans Non-Wnter Hardy Mix
Hairy Vetch Crimson Clover Annual Ryegrass Rapeseed Millet	15 15 25 20 25	1.75 1.5 3 0.75 5	2 2.25 3.5 1 6.25	Ahead of Corn 3 Species Likely to Overwinter
Sunflower Sunn Hemp Hairy Vetch Oats Millet	10 20 20 25 25	0.5 1.5 2.5 15 5	1 2 3 15 6.25	Ahead of Corn 1 Species Likelly to Overwinter
Millet Sorghum-Sudangrass Buckwheat Sunflower	25 25 25 25	5 6.25 11.25 1.25	6.25 8 15 2	Ahead of Soybeans Non-Winter Hardy Mix

Planting Date: August 1 - Non Winter Hardy Zone (Iowa Agronomy Technical Note 38)

Species Mix	% of Stand	Drilled	Broadcast	Comments
Cereal Rye Oats Hairy Vetch Crimson Clover Field Peas Rapeseed	25 25 15 15 10 10	11.25 15 1.75 1.5 3 0.5	11.25 15 2 2.25 4 0.5	Ahead of Corn 2 Species Likely to Overwinter if Seeding Early in the Seeding Windown
Spring Barley Oats Radish Kale Berseem Clover	25 25 15 15 10	15 15 0.75 1 1	15 15 1 1.25 1.25	Ahead of Corn Non-Winter Hardy Mix
Cereal Rye Oats Rapeseed Kale	40 20 14 15	18 12 0.5 1	18 12 0.75 1.25	Ahead of Soybeans 1 Species Winter Hardy

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