

Cover Crop Options for Wet Soils

Anne Verhallen, Soil Management Specialist - Horticulture, OMAFRA - Ridgetown

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After a wet spring and a number of heavy rains there are fields with drowned crop or in some cases fields that have not been planted. Rather than let the weeds grow this offers an opportunity for soil improvement with cover crops. Wet holes or depressional areas usually will benefit from some soil improvement – typically there has been some movement of fine textured soil particles that tends to seal the area and prevent water movement. While cover crops will add more surface crop residues, well established growing cover crops will help to dry wet areas or fields. Crop residues will also start to break down faster under the canopy of a growing cover crop. In turn cover crop roots will help to stabilize the soil and improve infiltration to aid in water drainage.

There are a number of things to consider when selecting a cover crop to cover and improve these wet fields:

- Do you have any nitrogen or herbicide on?
- What is the crop plan for fall 2015 – spring 2016?
- How are you going to plant the cover crop?

Let's start with the last one – how are you going to plant the crop. Is the field or area dry enough to get across yet? How much crop residue is present? There are fields with heavy drifts of residue that have floated in and concentrated in areas. Some of the unplanted acreage includes heavy clay soils with corn residue from last year – how is the best way to establish a cover crop there? Drilling in the cover crop would work best in the high residue situation but those soils are slow to dry this year. Another option is to broadcast the cover crop seed and hope there is enough moisture to get started. In that case choose cover crops that germinate fast and grow fairly aggressively so that they can get a root down into that blanket of residue. Cereal crops like oats, barley and rye generally will achieve a cover crop stand if broadcast and the weather is favourable.

Do you have any nitrogen applied to the field? Even after all the rain there is still probably a good amount available for a cover crop. Generally the grasses and non-legume broadleaf cover crops like radish are very good at scavenging nitrogen. Legumes will also pick up nitrogen, they are just not quite as efficient. One caution – radish and other brassicas like turnip do not do well on wet soils so may not be an appropriate choice for wet areas unless used in a mix.

Options for fields with no herbicides applied:

When will the cover crop seed be applied?	2016 - corn	2016 - soybeans	Fall 2015 - wheat
July	sorghum sudan, millet, cereal rye, oats or barley, mixes especially with legumes like clover, peas or vetch	sorghum sudan, millet, cereal rye, oats or barley, multi mixes (avoid vetch or significant amounts of legume in the mix)	Buckwheat would achieve the most growth BUT needs to be controlled promptly to avoid seed set. Avoid cereal grasses
August	cereal rye, oats, barley, mixes especially with legumes like clover, peas or vetch	cereal rye, oats, barley, multi mixes (avoid vetch or significant amounts of legume in the mix)	Not a large enough window for growth Avoid cereal grasses

Note – many legumes like clover are slow to establish and may let weeds get well established, use only in mixes.

Options for fields with herbicides applied :

Rain and wet soil conditions may have had an influence on the applied herbicides. Some may have leached lower in the soil profile while others may have degraded more due to microbial activity. Increased soil moisture does not always increase microbial activity; if the soil has been under anaerobic conditions ie waterlogged, herbicide like Treflan and Prowl will take longer to break down. Refer to the herbicide tables below developed by Dr. Darren Robinson of the University of Guelph, Ridgetown Campus.

Herbicide Persistence and Rotation to Cover Crops after Corn and Soybeans

Two important factors influence the potential for carryover injury to rotational crops: 1) how long the herbicide persists in the soil, and 2) the sensitivity of the cover crop to herbicide residues. Herbicides with shorter half-lives (the time it takes for 50% of the active ingredient to dissipate) are always less of a concern. Of course several factors influence the rate of dissipation such as rainfall, soil texture and soil pH, etc., however, most guidelines generally are for “normal” conditions (e.g. not severe drought). In general, products with a 4 month or less rotation restriction for the species of interest, close relative, or sensitive species (i.e. clovers) should pose little problem. These products typically have half-lives of less than 30 days. Species sensitivity can play a role if only a small amount of residue is necessary to cause injury and the herbicide persists. Quite often, small seeded legumes and grasses like the clovers and ryegrass and mustard species like tillage radish are very sensitive to some herbicides.

The following table provides some persistence and carryover information for some commonly used corn and soybean herbicides. Some of this information is our **best estimate**.

Table 1. Common corn herbicides, estimated half-lives, and their potential to injure fall-seeded cover crops.

Herbicide	Common name	Group #	Half life (days)*	Cover crops (OK to Plant)	Cover crops (Concern for)	Other
2,4-D	2,4-D	4	7	All grasses	Wait 30 days before planting sensitive broadleaves	Amine formulations more water soluble and can leach into seed zone
Accent 75DF	nicosulfuron	2	21	Fall cereal grains, ryegrass	Small seeded legumes, mustards, sorghum	More persistent in high pH soils (>7)
Atrazine 4L	atrazine	5	60	Sorghum species	Cereals, ryegrass, legumes, and mustards	More persistent in high pH soils (> 7). Rates < 1 lb/acre can allow more flexibility
Banvel II, Distinct	dicamba	4	5-14	All crops	Only at high rates or less than 120 days after application	Anything can be planted after 120 days with 24 fl. oz/acre or less
Broadstrike RC	flumetsulam				Hairy vetch, tillage radish	
Callisto (includes Lumax, Lexar, Halex GT)	mesotrione	27	5-32	All grasses	Small seeded legumes, mustards	Sequential applications (PRE fb POST) increase the potential for injury
Converge XT	isoxaflutole + atrazine	27, 5	50-120	Sorghum species	Cereals, Ryegrass, legumes, and mustards	15 inches of cumulative precipitation required from application to planting rotation crops except soybean, barley, wheat, sorghum, and sunflower
Dual II Mag 7.62E/Cinch	s-metolachlor	15	15-50	Almost anything	Annual ryegrass or other small seeded grasses	Higher rates and later applications more of a potential problem
Fierce	pyroxasulfone + flumioxazin	15, 14		All grasses	Small seeded legumes and mustards	Based on the half-life, all nonfood/feed winter cover crops should be OK

Herbicide	Common name	Group #	Half life (days)*	Cover crops (OK to Plant)	Cover crops (Concern for)	Other
Impact/Armezon	tompramezone	27	14	Wheat, barley, oats, and rye are allowed after 3 mo. Ryegrass should also be OK.	Although many broadleaves are restricted, Impact does not have much soil activity	
Lontrel (Hornet, Surestart)	clopyralid	4	40	All grasses	Small seeded legumes, including hairy vetch and crimson clover	Other clovers may be injured
Peak 75WG (Spirit)	prosulfuron	2	9-152	Cereal grains and sorghum are labeled, other grasses	Small seeded legumes, mustards	More persistent in high pH soils
Permit/Sandea 75DF	halosulfuron	2	9-27	Cereal grains and sorghum after 2 mo. and other grasses	Small seeded legumes, mustards	Halosulfuron also an ingredient in Yukon
Prism	rimsulfuron	2	2-4		None	More persistent in drought conditions
Simazine (Princep 9-T)	simazine	5	60	Sorghum species	Cereals, ryegrass, legumes, and mustards	Soil pH > 7

Table 2. Common soybean herbicides, their half lives, and potential to injure fall-seeded cover crops.

Herbicide	Common name	Group #	Half Life (days)*	Cover Crops (OK to Plant)	Cover Crops (Concern For)	Other
Assure II	quizalofop	1	60	OK to plant most broadleaves	Concern for all grasses if less than 120 days or at high rates	Plant anything after 120 days
Canopy Pro	chlorimuron + metribuzin	2, 5	40		Winter rye, winter wheat and somewhat on oats, small seeded legumes, mustards, sorghum, buckwheat	More persistent in high pH soils (> 7) and with higher soil applied rates
Command	clomazone	13	16-36	Oilseed radish	Winter rye, winter wheat and somewhat on oats	
FirstRate	cloransulam	2	8-33	Wheat, triticale, rye	Small seeded legumes, mustards, sorghum, buckwheat	
Guardian	chlorimuron	2	40	Cereals and ryegrass	Small seeded legumes, mustards, sorghum, buckwheat	More persistent in high pH soils (> 7) and with higher soil applied rates
Pinnacle	thifensulfuron	2	12	No restriction for wheat, barley and oats	None with 45 day waiting interval	
Pursuit	imazethapyr	2	60-90	Wheat, triticale, rye, alfalfa, clover	Oats, sorghum, mustards, buckwheat	Any crop can be planted 40 months after Pursuit application
Reflex	fomesafen	14	100	Cereal grains	Small seeded legumes, mustards, tillage radish, sorghum	Since fomesafen is often applied postemergence, soil activity can surprise users
Select (Arrow)	clethodim	1	3	All broadleaves	None assuming at least 30 days	Plant anything after 30 days
Sencor 75 DF	metribuzin	5	14-60	Cereal grains and ryegrass	Slight risk for small seeded legumes and mustards	Nonfood/feed winter cover crops allowed
Treflan	trifluralin	3	45	Annual ryegrass, oats	Buckwheat	
Valtera	flumioxazin	14	12-20	All grasses	Small seeded legumes and mustards	Based on the half-life, all nonfood/feed winter cover crops should be OK

* Herbicide half-life estimates derived from the WSSA Herbicide Handbook, 2007 or other scientific literature.