Land recovery following the March 28 wildfires

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What a horrible situation for all affected by the March 28 Willow Creek area wildfires, with devastating effects on homes, infrastructure, and fields. Severe wind erosion in the days following the wildfire have impacted croplands and pastures with cropland areas hardest hit, losing at least 1 cm of topsoil which has accumulated in ditches, farmyards, and adjacent stubble areas. Just to put things in perspective, that would be about 65 tons/acre of our most nutrient rich topsoil, containing more than 3 tons/acre of organic matter. The nitrogen alone in lost topsoil and burned residues would be about 400 lbs/acre, a sizeable loss along with the carbon and other nutrients that will need to be replaced over time as the land recovers from the wildfire effects.

Anyone who claims to have all the answers on how best to stabilize the land and recover productivity after a fire should be suspected (especially me). Having said that, experience from past fires has shown just how quickly cropland and especially pasture areas can recover with good management. There will always be a legacy effect as organic matter levels slowly recover.

Pastures will often regenerate but will need some time for recovery with lower stocking rates over the next while, especially this summer. Damaged areas may need to be reseeded, but time will tell.

Likewise, most of the affected lawn areas should recover after some removal of drifted soil, unless the sod was tilled or damaged while fighting the fire. Affected areas can be evaluated later in the spring and reseeded in mid to late spring if necessary. Sadly, many of the farmstead trees will have been lost, although caragana, lilac or willow should recover with time.

Stabilizing cropland areas after a spring wildfire is so much easier than after a late fall wildfire. Witness the significant erosion we have experienced across the chinook belt this winter on fields with poor soil cover – whether from fall fires or excessive tillage.

By the time you read this, initial actions will already be taken for most of the affected cropland areas and the collective advice within the community will have weighed heavily on what solution is best for a specific situation. By way of review and at the risk of over generalizing, here are some options used to stabilize cropland areas following a spring wildfire:

- Roughen the soil surface to break the wind driven soil sheering action until the land can be seeded, often with spikes on a chisel plow at right angles to prevailing winds; can do every second or third pass to stabilize field and fill in and when needed.

- Sufficient surface roughness can often be achieved by seeding with a hoe-type drill that leaves distinct ridges, at right angles to prevailing wind, traveling at slower speeds to maintain prominent ridges.
- Cover the affected area or at least the focal points for erosion with enough manure to stabilize the ground (usually need at least 25 to 30 tons/acre of fresh manure), seeding later in the spring
- As above, but stabilized by spreading and anchoring straw (MD of Willow Creek has a tool to help hairpin spread straw); this option only makes sense for focal points or areas that are much more erodible (sandier areas or blowouts).

With the above, we are assuming that the strongest winds will be from the west, south west although we do at times get a strong north wind accompanying a cold front, but the hope is that will not occur, or at least not until we get something growing or some precipitation to crust the soil.

Experience has shown that cereals are the best choice, providing more immediate cover and surviving the sandblasting in the days and weeks after emergence. If a broadleaf is essential because of a soil residual herbicide, then farmers should consult an agronomist to work out a plan. In the meantime, those land areas will need to be spiked to create surface roughness or manure applied to hold the ground until it can be planted later in the spring.

Cereals also help to rebuild soil cover that not only reduces future erosion, but is also vital for water infiltration, reducing evaporative losses and keeping soils cool through the heat of summer. Increasing the proportion of cereals in rotation, avoiding the temptation to bale straw and some cooperation from the weather will help build soil cover in the next few years.

Soil productivity and health will recover as organic matter is restored. The quickest way to hasten that recovery is a manure application if available – there is no better way to kick start degraded soils than livestock manure! It supplies much needed nutrient for the crop and feeds the soil biota which in turn rebuilds soil aggregates and organic matter. We can also achieve this with good crops and some additional fertilizer, not discounting the possibility for a rotation with inclusion of perennial forage or annuals for grazing. With all our options, the main goal is to get the soil back on the trajectory for recovery, allowing natural processes to build soil health.

Soil erosion after the March 28 Claresholm wildfire

Seeding burned cropland area, east of Claresholm

Manure application to control erosion, south of Claresholm

This article will be posted on the Municipal District of Willow Creek webpage for future reference