

CA offers a practical solution TO WIND EROSION

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Decline in soil fertility and drought are two problems that appear to be worsening year after year on wheat farms in the Free State province. These two problems can be linked to severe wind erosion, which not only removes tons of fertile soil from croplands, but also has a desiccating effect on the soil.

A unique feature of the Free State is that most farms are open grasslands, with very little to no trees at all. Under the clear blue skies of July to September, strong winds blow over the farms at speeds of up to 80 km/h, with devastating consequences.

Removal of eucalyptus trees worsened wind erosion

Successful dryland wheat farming is dependent on stored soil moisture and good soil fertility. As such, the strong winds are partly to blame for declining dryland wheat yields and the consequent disinterest in dryland wheat production. In the past, eucalyptus plantations were widespread on farms to serve as windbreaks. However, most of these plantations have since been removed in line with government regulations which classify eucalyptus as being invasive, reducing biodiversity and having a significant negative impact on scarce water resources. Some wheat producers believe that the trees use a lot of water (up to 1 000 l/day per tree) and generally worsen drought effects when they are in proximity to cropped lands. However, it is clear that the eradication of gumtrees has worsened wind erosion.

Wind erosion exacerbates nutritional deficiencies

The effects of strong wind on dryland wheat early in the season are devastating. A desiccation effect results in death of wheat seedlings and the dry soil that is blown around sometimes buries the emerging wheat. This results in poor crop stands and a subsequent low yield. The wind also blows away top soil that is rich in nutrients and soil organic matter. Basically, left on some farms are just sandy soils that are lacking in essential nutrients.

These changes have gone unnoticed for many years, because mixing the soil through tillage masks the effects of wind erosion. Sandy soils have bigger pores and are more prone to nutrient leaching due to their high infiltration rates. This has a further damaging effect on the growth of wheat by inducing early nutritional deficiencies. Experts estimate that as much as 10 tons of rich top soil and organic matter can be lost per hectare per year when wind erosion is unabated. Dryland wheat producers had to increase fertiliser ap-

plication rates for dryland wheat to compensate for the declining soil fertility.

Resorting to hay bales for mulching

In desperation to deal with the wind erosion's harmful effects on early wheat growth, some producers have resorted to spreading mulch made from hay bales on the dryland wheat fields. The mulch serves to conserve moisture, protect wheat seedlings and minimise soil loss during early growth of the dryland wheat. This strategy may work, but will obviously increase production costs for dryland wheat.

Reasons to adopt conservation agriculture

A more sustainable and practical solution to the wind erosion challenge lies in conservation agriculture (CA). For starters, not tilling the soil will maintain a crop residue cover for wind erosion control with the added benefit of soil moisture conservation. At least a 30% ground cover is needed to prevent or minimise wind erosion. CA is based on three principles, namely reduced tillage or no-till, permanent soil cover (through crop residues and cover crops) as well as a good crop rotation (which includes legumes).

Excessive tillage of the soil prior to planting dryland wheat during the winter time dries out the surface soil and leaves it prone to erosion. If producers can plant dryland wheat using no-till in the Free State, the fields will become more resistant to wind erosion in late winter and spring. This will help to conserve soil moisture and nutrients, thus increasing dryland wheat yields and farm profits. Costs are also saved through reduced tillage operations. Conserving the soil is not only critical for the sustainability of dryland wheat farming in the summer rainfall areas, but also for ensuring that the farmlands remain productive for future generations.

Reluctance among producers

Despite numerous efforts to promote adoption of CA, some producers remain reluctant. It has been scientifically proven that a successful CA establishment requires about five years. Reluctant producers argue that the practice is too expensive. They say it is too challenging to change from traditional farming practices and that five years are a bit long without significant profit while trying to establish CA. As such, most of the producers lose motivation in the middle of CA establishment and go back to their traditional farming practices. There is a need for those producers who have successfully adopted CA to lead the initiative of encouraging producers who are still hesitant about CA. ●

