Wind erosion and topsoil drift considerations

While practices like no-till and stubble retention have greatly improved soil resilience, dry seasons have highlighted how vulnerable paddocks can still be when surface cover is lost. Dry starts and poor finishes leave areas exposed, with wind erosion and topsoil drift re-emerging as real threats, even beyond traditional sandhill zones.

In the past few weeks, signs of drift have been reported across various soil types. It's a timely reminder of the importance of maintaining ground cover, managing high-risk areas and acting quickly to minimise further damage.

Image courtesy of ABC North and West (28 May 2025) on Facebook.

PREVENT & ACT: MANAGEMENT STRATEGIES FOR HIGH-RISK SITUATIONS

Managing the implications of erosion requires monitoring of high-risk paddocks/areas and being ready to adjust plans. Taking action early can make a big difference in holding soil and setting crops up for the rest of the season by minimising damage and supporting crop recovery.

PREVENTION before a significant wind event

- Choose the right crop type; cereals provide more stubble cover than legumes and pulses.
    - A long coleoptile wheat, barley or cereal rye is suitable for early or dry sowing.
    - For late sowing, use barley or cereal rye.
    - Reduce legumes, pulses and fallows in the rotation.
- Leave as much standing stubble as possible by inter-row sowing, as this holds together the soil structure.
- If possible, use a disc seeder to minimise soil disturbance, particularly in wettable soils.
- Minimise traffic and livestock on high-risk areas.
- Establishing the crop early is key to preventing wind erosion as it provides ground cover and stabilises the soil.
    - Apply ‘soft’ pre-emergent herbicides to reduce risk of crop damage or, in severe cases, remove use of any pre-emergent herbicides.
    - Use sufficient fertiliser rates to supply phosphorus, nitrogen and sulphur, particularly on deep sands, to promote early vigour and growth.
- Double sow or pre-spread seed on hill tops to increase plant numbers.
- Ameliorate fragile soils by clay or compost/manure spreading.
- If you are considering dry sowing sand hills, ensure the soil is not water-repellent.
- If a rainfall front is expected, with no strong winds forecasted beforehand, and you are considering sowing later into moisture, ensure;
    - You are sowing either barley or cereal rye.
    - A knife point press wheel seeding system is used if dealing with water-repellent sands.

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ACTION after a significant wind event and soil loss

1. Assess paddocks promptly

Assess paddocks within 48 hours after a wind event to evaluate:

- Emergence consistency.
- Extent of topsoil movement.
- Signs of seedling damage or burial.
- Use GPS or drone mapping to identify areas that may require re-sowing.

2. Re-sow where necessary

In highly eroded or blown-out areas (especially on sandy rises), re-sowing may be needed.

- Cereal rye or barley is preferred for fast establishment and soil cover.
- Focus re-sowing on zones with <30–40% plant emergence or where seed has been lost.

3. Preserve ground cover

This is critical to avoid further soil disturbance and movement.

- Minimise machinery traffic in eroded areas to:
  - Prevent additional soil movement.
  - Reduce seedling damage.
  - Maintain any existing stubble.
- For grazing crops, avoid over-stocking as livestock typically camp on hills.

4. Review nutrient strategies

Wind erosion disproportionately removes lighter, nutrient-rich particles.

- Nitrogen (especially nitrate-N), phosphorus and sulphur may be lost or relocated.
- Topsoil testing (0–10cm) in affected areas will help guide response.

5. Monitor weed pressure & crop safety

If pre-emergent herbicides have been displaced, crop damage is possible where furrows have filled in or collapsed, and weed control is compromised.

- Where weed control has not been achieved due to significant movement of herbicide treated soil, consider an early post-emergent spray.
- Avoid layering herbicides if crop emergence is uneven or delayed, as plant stress can increase phytotoxicity risk.
- Use integrated weed management (IWM) strategies to manage variability. Targeted crop topping, windrow burning, or chaff lining may help in worst-hit areas.

A REMINDER OF THE IMPLICATIONS OF WIND EROSION AND TOPSOIL LOSS

According to GRDC and CSIRO studies, wind erosion can remove up to 5–10t/ha of topsoil in a single event. Understanding the impacts of wind erosion and topsoil loss informs the way we need to manage the paddock going forward. This is not just a short-term issue, it can result in uneven paddock performance for years if not addressed.

Soil movement

- Formation of ruts, gutters and exposure of subsoil/hardpan layers, limiting root penetration and water infiltration.
- Redistribution of soil across paddocks or into neighbouring fields, requiring levelling or soil removal in severe cases.
- Damage to infrastructure, including buried or destabilised fences, blocked drains, filled dams and eroded farm tracks.

Nutrient loss

- Topsoil nutrients (e.g. nitrogen and phosphorus) are critical for crop establishment until the roots are developed.
- A significant proportion of soil organic carbon sits in the top 0-10cm of soil, so overall soil fertility is reduced when this is lost.

Poor crop establishment

- Wind events can sandblast emerging crops, damaging leaf tissue and reducing early vigour.
- Weed control from pre-emergent herbicides is compromised, as treated soil is displaced or removed. This reduces herbicide efficacy and allows weeds to establish, unchecked by herbicides.
- Furrows may accumulate displaced pre-emergent herbicides, increasing chemical concentration and leading to crop damage or uneven establishment.
- Loss of moisture due to exposed drifted soil delays germination/establishment and reduces the ability of the soil to retain moisture.

Financial impact

- Remediation costs can include;
    - Re-levelling paddocks using graders, or laser buckets in extreme cases.
    - Reapplying or changing herbicide plans.
    - Sowing cover crops or windbreaks to stabilise fragile soils.
    - Soil testing and nutrient replacement.
    - Potential loss of long-term rotation.

Useful resources

Improving crop productivity on sands – what is the latest? (GRDC)
https://grdc.com.au/resources-and-publications/grdc-update-papers/tab-content/grdc-update-papers/2021/07/improving-crop-productivity-on-sands-what-is-the-latest

Managing Eroded Soils – Southern Region Fact Sheet (GRDC)
https://grdc.com.au/__data/assets/pdf_file/0031/446395/AGRGRD-Eroded-Soils-Fact-Sheet_FA_online.pdf

Robust Ground Cover Key Messages (Mallee Sustainable Farming)
https://msfp.org.au/wp-content/uploads/2024/12/Robust-Ground-Cover-Key-Messages-FACTSHEET.pdf