

Planning and attention to detail key to windrow burning success

ANDREW STORRIE*



THIS POST-BURN WHEAT PADDOCK SHOWS THE LEVEL OF ACCURACY AND EFFICIENCY ACHIEVABLE WITH WELL-MANAGED WINDROW BURNING AND THE PERCENTAGE OF PADDOCK LEFT WITH FULL STUBBLE COVER AFTER A GOOD BURN.

Doug Smith believes narrow windrow burning suppresses weed populations and he and his neighbours have shown it is possible, with good planning and attention to detail, to successfully burn windrows from 5t/ha barley crops.

Doug, who farms at Pingrup, WA, where growing season rainfall is 250 to 275mm, sows 2,500ha a year of wheat and barley plus canola, field peas and lupins using a one-pass no-till system with knife points and press wheels.

He also runs an on-farm agricultural supply business that plans and supplies chemical and fertiliser programs for 60 clients.

Windrow size and type

- Aim to keep rows to about 500-600mm wide.
- Make sure chutes capture and channel all chaff and weed seeds into the windrow.
- Do not over-thresh crops. Over-threshing leads to rows that settle tight and allow little or no airflow so they smoulder rather than burn well. Rows that smoulder do not get hot enough to kill weed seeds.

- Make sure the chute does not restrict air flow from the harvester cleaning fan. Most chutes need to open back and front. Closing the front leads to reduced harvest capacity in crops yielding more than 4 t/ha.
- Try not to run over rows with headers/chaser bins etc. because this crushes the rows, giving the same result as over threshing.

There is no magic number. The 'right' conditions change every year depending on fuel load.

- Slow the harvester ground speed at the end of the runs so the sieves empty at the same time as the rotors. This prevents tails of seeds with no straw to burn.
- The use of stubble mats to protect the front tyres of the harvester can help form mini fire breaks along each side of the rows. The mats tend to lay down stubble so it is less prone to light up due to radiant heat from the rows during burning.

- Make sure the header knife is in good condition. This is particularly important if crops are lodged. Blunt knives tend to pull and lay ryegrass down in cool conditions rather than cut it with the crop.
- Harvest in the same direction the crop is sown. This is very important in heavy crops because if the windrows run across the crop rows the fire will carry down the crop rows that run away from the windrows.
- The exception to the above rule is when old stubble rows are being used to guide seeder bar steering (i.e. when using I-TILL). When using this system the header needs to operate at about 15 degrees to the direction the crop was seeded.
- Wider header fronts enable better windrows in lighter crop years. They can prove challenging when handling crops yielding in the order of 5t/ha but the results are worth the effort.

Crops and varieties

- Wheat varieties vary greatly in the type of residue that comes out of headers.

- Yitpi produces excellent rows with good retained straw size.
- Gladius produces finer residue that requires careful harvesting to achieve a reasonable burn.
- Wyalkatchem produces very poor windrows of almost powder-like residue, making it unsuitable for windrow burning.
- Mace, if treated right with the harvester, will produce good rows but is susceptible to over-threshing in the heat of the day.
- Canola and lupins produce rows that will burn at the highest temperature for the longest period of time.
- Some types of barley produce good rows but it can be tricky to avoid burning the whole paddock when burning barley windrows because the low fluffy flag can carry the fire between the rows.
- Doug has found that the windrows from even 4-5 t/ha Scope and Buloke barley crops can be burnt very successfully provided everything is right. Paddock and weather conditions are critically important when burning barley windrows. His experience suggests the humidity needs to be at



A CLOSE-UP IMAGE OF A BURNT WINDROW IN THE STUBBLE OF A 5T/HA BARLEY CROP. NOTE THE PROXIMITY OF THE STANDING STUBBLE AND HOW LITTLE RESIDUE THERE IS IN THE WINDROW LINE AFTER THE BURN.





“We were raving about
the lack of ryegrass”

Corbin Schuster, Freeling

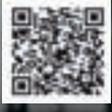
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75%, wind speed at less than 12 km/hr and temperature around 12°C.

Burning and lighting

The FESA McArthur Index, which is used to calculate the fire danger in grassland, is invaluable when deciding whether or not to burn. It uses temperature, humidity and wind speed to calculate a scale that gives a guide to the best windrow-burning conditions. The Pocketfire® app for iPhones and iPads can do the same thing.

As a rule of thumb, a Fire Danger Index of:

- less than 15 will give a reasonable burning result but there is a risk of burning inter-row if conditions are windy.
- 8-10 is good and probably ideal.
- 2 and lower will not give a good result as conditions are too cold and humid. At this level the rows smoulder and are likely to flare up and burn the paddock bare when conditions warm up the following day.
- greater than 15 carries the risk of the fire getting out of control.

There is no magic number. The 'right' conditions change every year depending on fuel load.

Ignite windrows at 90 degrees or diagonal to the windrow rather than along the rows. This prevents the fire developing a face that can carry between the rows.

Light up across the windrows every 75 metres in good conditions and plan to light much closer as conditions cool down. The fires will burn to meet each



TRY NOT TO DRIVE OVER WINDROWS. VEHICLES TRAFFIC COMPRESSES WINDROWS SO THEY SMOLDER RATHER THAN BURN WELL AND DO NOT GENERATE ENOUGH HEAT TO KILL WEED SEEDS.

other. In good conditions this takes only 25-30 minutes.

Plan to begin burning just on dark, when conditions are cooler, but plan to finish burning by the time dew falls. This limits stubble smouldering and subsequent

flare-ups following day. This time constraint means that a single team can burn only 200-300 ha each night.

Invest in a good fire lighter. Doug uses a gas/diesel fuelled unit mounted on a 650cc quad bike with a lighting speed of 30-40km/hr.

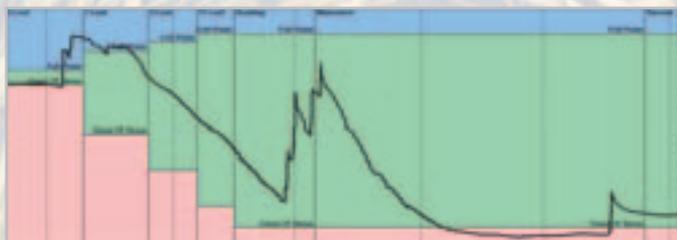
For further information:

- Find an expanded version of this article and images and plans for header chutes at: http://www.agronomo.com.au/storage/newsletters/Doug_Smith_Burning_big_crops_web.pdf
- Harvest seed management: <http://www.ahri.uwa.edu.au/news/AHRI-insight/Spoiled-rotten>

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This article was published in the 2014 spring edition of 'Giving a RATS'.

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