Accelerating Barley Harvest Timing

As part of the new GRDC funded Correct Crop Sequencing (Double Cropping) Project, the treatments for 2014-15 are focussing on the use and residue degradation of the Group B herbicides under irrigated conditions. This site is at Numurkah, and was sown to Clearfield barley and canola as the winter phase of the double cropping rotation.
The only current barley variety with Clearfield herbicide technology is Scope CL®. Variety trials have shown it to be a variety prone to lodging in high yielding situations. In the trial at Numurkah, the site had been pasture for several years and had a high N status. Combined with early sowing, this resulted in excessive vegetative growth and the crop began to lodge in late August.

Inspection in late October showed that while a majority of the barley was approaching maturity, a fresh crop of new tillers had sprung up where the crop was badly lodged. As timely harvest is essential to successful double cropping (so as the following summer crop of maize can be planted), ways of accelerating the barley ripening were tested, namely desiccation and windrowing.


Lodged barley crop with fresh green tillers

Windrowing timing is dependent on the crop being ripe enough. The Western Australian Department of Agriculture and Food produce a “Barley harvest and grain quality” booklet and this was used as the guide for when to windrow (or swath).
An excerpt on timing is:

When to swath
Swathing can begin when grain moisture content is below 35 % and when the grain is at the medium dough stage and is hard but can still be dented with the thumbnail. It is better to swath early to prevent losses from shedding and lodging, but do not swath when the ground is wet after rain.

Grain filling studies have shown that barley reaches maximum grain weight when all of the green tissue has gone from the flag leaf sheath and the peduncle (stem immediately below the head). Avoid swathing too early as the grain is not fully developed and this will give small pinched grain. Whilst it is often easier to swath later than earlier, the swaths of a ripe crop may not interlock well enough to withstand disturbance from a strong wind.

High yielding crops are likely to gain more from swathing than low yielding crops. Generally, crops that are likely to yield less than 2 t/ha should not be swathed.

The crop was windrowed using a canola windrower with enclosed knife guards. Even though the crop was quite lodged, the windrower would have missed less than 1% of heads.

Stubble after being windrowed.

An inspection of the windrow a week after showed the underside was drying quite well. The windrows were quite large but did not collapse prior to harvest. The windrow did dry quite well and could have been harvested two weeks after windrowing.

The windrower and windrow

The other treatment was desiccation using Roundup® Attack™. This product is registered for wheat but not barley. The instructions for use on wheat are to apply when the grain is at the late dough stage (28% moisture) onwards, and the grain will not be used for seed or sprouting (which automatically excludes its application on malting barley). The herbicide was applied at 1.5 l/ha with 100 l/ha of water. Again, the desiccated crop was ready to harvest two weeks after application.
Actual harvest occurred on December 3rd, partly due to waiting for the untreated crop to ripen but also waiting for a contractor to harvest the paddock.

Barley	Treated	Yield t/ha	Retention %	Protein %	Test wt kg/hl
Dessicated	29-Oct	5.31	67.0%	14.3	69.7
Windrow	29-Oct	6.23	61.0%	15.1	71.0
Direct	3-Dec	6.28	63.1%	14.4	66.3

The appearance of the desiccated and untreated crop was similar prior to harvest, with no noticeable loss of grain. The lower yield from the desiccation treatment was probably more due to paddock variability than a negative effect from desiccation.

The windrows were uniformly gold on top but the green shoots underneath had dried and remained green in colour. All grain moisture levels were similar at harvest (approximately 9%).
Harvested grain did contain some dirt in the sample. The canola front did pick up some dirt attempting to lift the windrow up and the fingers did flick dirt up into the windrow. Dirt also was in the untreated sample due to the header front being very close to the ground and the plants laying sideways sometimes jammed in the knife guard and were pulled up rather than cut off by the knife.

Overall I believe the experiment was a success, with the canola windrower (in the hands of a skilled operator) quite successful in windrowing the crop and harvest been brought forward by two weeks. Grain yield or quality did not suffer as a result of windrowing, but careful assessment of the maturity of the crop needs to be made as there is the potential for early windrowing having a negative effect on grain quality.