Desiccants - a tool for improving harvesting efficiency in lodged rice crops

- **Reglone®** is registered for use as a desiccant on rice and can be used to increase harvesting efficiency in lodged crops.
- **Efficiencies include** faster harvest, less stress on the operator, less wear and tear on the harvester and timely harvest of other rice crops.
- **Harvest early crops** soon after the 5-day withholding period as grain moisture declines rapidly in warm weather.
- **The whole grain yield** of crops sprayed with Reglone® was similar to non-sprayed crops with some above average and some below average.

2017 presented many challenges at harvest due to seasonal conditions that triggered lodging that has not been as bad since 1997. All varieties were affected by lodging to varying degrees including Sherpa, Reiziq, Koshi and the two new varieties YRM70 and YRK5.

Reglone® was used to desiccate approximately 1000 ha prior to harvest in C2017 on YRK5, Koshi and Sherpa crops in the eastern Murray Valley.

Use of Reglone® on rice in Australia has been limited and there has been limited research on the use and impacts of Reglone® on rice. So Rice Extension talked to 3 growers who used Reglone® in C2017.

These crops were harvested from 6 to 22 days after spraying. The rate of decline in grain moisture after spraying varied depending on temperature and rainfall conditions. The cost, including aerial application and depending on rates used, was between $60 and $70/ha.
Case study 1: Monitor grain moisture when applying Reglone® as moisture falls quickly in high evapotranspiration conditions

An aerial sown Koshi crop that had been lodged for some time was drained 20 March followed by rain on the 22 March. A hand-threshed sample was collected for moisture testing on 26 March, which indicated a moisture level of 24% - lower than what the farmer had anticipated. Reminder - it is important to monitor rice crops post draining.

The crop was sprayed with Reglone® on 28 March. Due to a shortage of Reglone®, the lower label rate of 2.5 L/ha was applied to maximise the area sprayed. An area was left unsprayed to use as a control to observe the impact of the desiccation. Harvest commenced on the sprayed area on 6 April with the grower happy with the improved harvesting results - increased speeds and less header breakdowns. An attempt was made to harvest the unsprayed part of the crop but due to much slower harvest speeds and breaking sheer bolts, the decision was soon made to desiccate the remaining area and increase the Reglone® rate to 3 L/ha.

There was no significant change in the moisture content of the crop until approximately 14 days after spraying when grain moisture levels declined to 15%, outside the recommended harvest moisture of 18-22%. The grower was able to burn his stubble and plant a canola crop on time.

Reglone® contains 200 g/L Diquat and is a group L herbicide. It is a non-selective herbicide for use as a desiccant and is registered for use on rice.

The recommended label rate is 2 to 3 L/ha.

Reglone® does not contain a wetting agent and it is recommended to add Agral® at the rate of 200 mL/100 L or BS1000* at 160 mL/100 L of prepared spray.

Spray when the grain is mature – when not more than 2 to 3% of the grain is still at the milky stage and the grain moisture content must be less than 25%.

There is a 5 day harvest withholding period after spraying before the crop can be harvested.

Aerial Application

Flying height, pressure, nozzle size and positioning on the aircraft should be such as to minimise spray drift. Apply 30 to 60 L of spray per hectare. Avoid spraying in high winds or under temperature inversion conditions.

Caution

Reglone® contains a rapid spotting effect on green foliage and, as with all herbicides, take special care to avoid drift onto adjacent crops.

The Reglone® label states: “Do not use treated water for human consumption, livestock watering or irrigation purposes for 10 days after application”.

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Case study 2: Desiccating lifts harvest productivity, reduces operator stress levels and harvesting costs.

This case study looks at the economic benefits of using Reglone® as a tool in a 7 t/ha lodged Koshi crop. Both contractor and owner-operator rates, using a stripper front are used in the cost analysis in the table below. Prior to desiccating, the harvest efficiency was 6t/hr. Once the crop had been desiccated the harvest efficiency lifted to 19t/hr.

It is evident from this case study that desiccating the crop is very cost effective with a total cost benefit on contractor rates of $329/ha or $13,160 over a 40 ha crop.

Similarly for the owner operator there is a cost benefit of $224/ha or $8,960 over a 40 ha crop.

The other benefits include a faster harvest, less stress on the operator, less wear on the harvester and being able to get on with timely harvesting other rice crops to ensure harvesting between 18 and 22% moisture to maximise whole grain yields.

<table>
<thead>
<tr>
<th></th>
<th>Harvest efficiency (t/hr)</th>
<th>Harvesting rates ($/hr)</th>
<th>Harvest cost ($/t)</th>
<th>Desiccation cost ($/t)</th>
<th>Total cost ($/ha)</th>
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<tbody>
<tr>
<td>Not desiccated</td>
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<td></td>
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<tr>
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<td>$350</td>
<td>$18</td>
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</tbody>
</table>

Case Study 3: Using Reglone® to keep harvest on track

This aerial sown YRK5 crop lodged into the water prior to draining. See the photos below: lodging was severe. 80% of the crop was lodged to some degree. As the YRK5 was the first crop on the farm to mature, a decision was made early to desiccate using Reglone® as a tool to allow earlier harvesting.

The grower had Koshi and Langi to harvest as well, so he was very conscious of getting his crops off in a timely manner to prevent the other crops from lodging before harvest. The crop was drained on 14 March. Two weeks after draining a hand threshed grain sample was taken and sampled for moisture content. The sample was a deceiving 22.8% as the crop was still quite green (see photos below).

The crop was sprayed with 3 L/Ha of Reglone® on 30 March, which allowed harvest to start on 5 April, and harvest of all crops completed in a timely manner.

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Severe lodging in the YRK5 crop before draining on 14/3/17, photo taken two days after draining. Unluckily the crop then received 35 mm of rain on 22/3/17.


Five days after spraying 3 L/ha of Reglone®. Note the Reglone® killed everything it contacted, including the cumbungi.

Take care when applying Reglone® to prevent damage to winter crops and pastures that have emerged and are in close proximity to rice.

Close up of desiccated crop prior to harvest showing good penetration into the canopy and dry leaves and stem with no greening.

This photo shows that penetration of the desiccant was not as good on the ends of the bays where there was a lot of vegetative growth - but better than expected from past anecdotal experiences. Lodging was earlier in these patches due to nitrogen overlaps prior to permanent water.