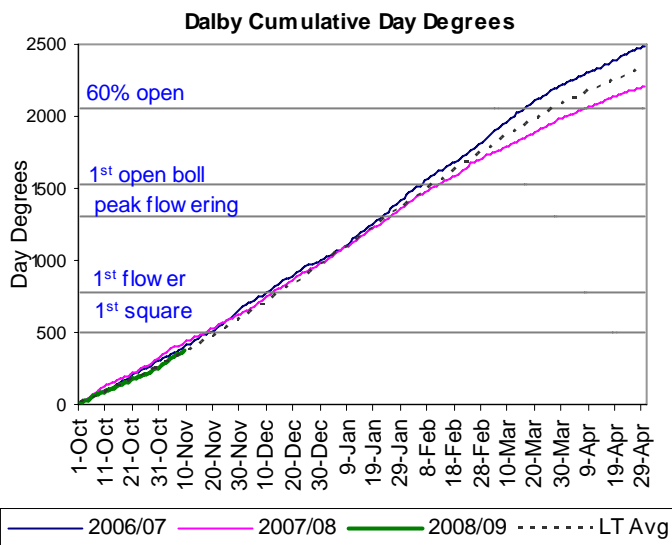


Day Degree Accumulation Oct 1- Nov 9

Region	08/09	07/08	Cold Days	Hot Days
Dalby	377.1	427.3	16	1
Brookstead	363.75	393.75	17	1
Jondaryan	358.75	398.25	16	1
Warra	394.0	440.75	14	2

Source: <http://www.longpaddock.qld.gov.au/silo/>



Strategic Management of Weeds In A Flex System

Thanks to Graham Charles & Susan Mass for this article

A large proportion of area of Roundup Ready Flex® has been planted on the Downs, and with growers no longer constrained to over-the-top glyphosate applications up to 4-nodes, there is increased opportunity to be strategic with weed management.

Graham Charles (NSW DPI, Cotton CRC) & Ian Taylor (CRDC) have developed a threshold that predicts the start & end of critical period for weed control for a range of weed types and densities. Similar to insect thresholds, the critical period for weed control is a concept that relates yield losses caused by weed competition to an economic threshold.

Before critical period – small weeds do not need to be controlled as they cause no economic loss.

Critical period – weeds at densities above threshold must be controlled while still small to avoid significant yield losses. The strategy of controlling small weeds may require more glyphosate applications, but utilize lower herbicide rates.

After critical period – Small weeds will not cause economic loss, but may need to be controlled to avoid harvesting difficulties, lint contamination & **must not be allowed to set seed**, as this increases future weed problems & herbicide resistance risk.

This contrasts with another common strategy based on delaying glyphosate applications to maximise the efficacy of each spray, minimising the number of sprays & ensuring that the maximum number of weeds are controlled with each input. For example scheduling glyphosate applications at 6 nodes, with a 2nd application at 10 to 12

nodes, giving good spray efficacy & weed control. While this approach is valid, the critical period approach suggests that to avoid yield losses, the first glyphosate application may need to occur sooner, with further applications following closely after successive weed germination events.

Start and end of the critical period for weed control (day degrees since planting)

Weed density no./m ²	Irrigated (high yielding) cotton					
	Broad-leaf weeds				Grasses	
	Large		Medium		Start	End
0.1	145	189	145	172	-	-
0.2	144	275	144	244	-	-
0.5	143	447	143	387	-	-
1	141	600	141	514	-	-
2	139	738	139	627	-	-
5	131	862	131	729	129	174
10	121	915	121	771	127	248
20	106	944	106	795	125	357
50	87	962	87	810	119	531
Min. density	0.06		0.07		2.5	

The predicted start & end of weed control critical period for Large broad-leaves (eg thornapples, noogoora burrs, Sesbania); Medium broad-leaves (eg bladder ketmia and Chinese lantern); & Grass weeds (eg sweet summer grass). The minimum weed densities needed to trigger the critical period are also shown.

An alternative herbicide or early layby application of residual herbicide could be used to replace a glyphosate application & reduce excessive weed pressure. Prometryn or fluometuron, can be applied as an early layby to cotton as small as 15cm high to control a wide range of small emerged weeds & residual control. An alternative residual, such as diuron, could be applied later in the season as a standard layby application if necessary.

Herbicide Resistance Risks

With no IWM strategies, one application of glyphosate per year will see resistance develop in about 15 years.

Resistance starts in paddocks in several ways:

- Contaminated seed, feed or machinery
- Seed dispersal or pollen movement
- Rare gene mutations

Frequent applications of the same mode of action group with no other controls will kill the susceptible part of the weed population & eventually allow rare plants with resistance gene to increase and dominate. Strategies to minimise the risk of resistance developing include:

- Ensure no survivors set seed & replenish the soil seed bank.
- Rotate between different herbicide groups &/or use tank mix with an effective herbicide from another mode of action group. Use effective 'stand-alone' rates for both herbicides in the mix.
- Use a wide range of cultural weed controls such as tillage, different crops, & different cultivars.
- Keep weed numbers low.