

## A Reminder on Pre-harvest Management of Staygreen Sorghums

By Ivan Calvert, DuPont Pioneer

Grain sorghum hybrids such as Pioneer® hybrids G56 and G99, which have higher levels of staygreen, require slightly different pre-harvest management to those with lower levels of staygreen.

We have added these hybrids to our G series product range because they provide:

- Increased resistance to diseases such as charcoal rot and fusarium stalk rot,
- Increased resistance to lodging due to drought stress,
- Healthier crops for longer in the season to help fill grain even during periods of late season moisture stress.
- Higher yield and larger grain size in drought-affected crops.

The most important point is that hybrids with higher levels of staygreen need to be as close as possible to full black layer before spraying out with glyphosate. Because staygreen hybrids will be healthier and greener at the end of the season, pre-harvest spray-out can be delayed until the crop is mature because there is little to no risk of lodging.

In some cases spraying too early has induced lodging, small grain and low test weight in staygreen and traditional senescent type hybrids.

In the 2010-11 season the Pioneer research team ran a trial to determine best management practices for pre-harvest spray-out of grain sorghum hybrids with higher levels of staygreen. In the trial, four hybrids with varying levels of staygreen were planted over four planting dates (day 1, day 6, day 13 and day 17). When all the hybrids on the earliest planting date (day 1) had reached 100% black layer (physiological maturity) and had grain moisture levels less than 20%, the entire trial was sprayed with Roundup and ammonium sulphate. This meant that many of the hybrids on the later plantings (days 6, 13 and 17) were sprayed out well before reaching black layer (see table 1)

Table 1: Percentage of black layer of the four grain sorghum hybrids when all treatments were sprayed out.

Hybrid	% black layer			
	Planting day 1	Planting day 6	Planting day 13	Planting day 17
86G56 – high staygreen	100	95	85	60
84G99 – mod/high staygreen	100	95	85	65
84G22 – low/mod staygreen	100	100	90	70
MR.Buster– low staygreen	100	100	90	70

Table 2: Percent grain moisture eight days after spray-out

	MOISTURE %			
	Planting day 1	Planting day 6	Planting day 13	Planting day 17
86G56 – high staygreen	14.9	16.2	17.6	18.8
84G99 – mod/high staygreen	14.3	15.2	16.8	18.6
84G22 – low/mod staygreen	13.2	14.3	14.4	15.5
MR.Buster – low staygreen	13.1	13.5	16.2	17.1

Results (see table 2)

- Irrespective of the level of staygreen, spray-out at 100% black layer and below 20% grain moisture resulted in all hybrids achieving acceptable grain moisture levels eight days after spraying.
- The effects of the premature spray-out on the hybrids from planting days 6 and 13 of the staygreen hybrids can be seen in higher grain moisture compared to the lower staygreen hybrids. This could result in increased time to harvest.
- When all hybrids were sprayed for the day 17 planting time the grain moisture was the highest of all planting times and there was little difference between hybrids.
- Day one and six planted hybrids showed no signs of lodging. Day 13 and 17 planted hybrids showed some signs of lodging.

To determine the ideal timing for pre-harvest spray-out:

- Do not judge maturity by grain colour. Some hybrids (eg G56 and G99) change colour early in the grain-filling process which can lead to a false indication of the stage of maturity.
- Black layer should be determined by assessing seed the very bottom of the head. In later-planted crops check the seed on the bottom of the southern side of the head.
- Use grain moisture as an indication of maturity. If moisture is less than 20% spraying with glyphosate at label rates will kill the crop effectively and will allow harvest to begin 10-14 days later.



Photo: Pioneer® hybrid G99 (right) in a side-by-side comparison with a non-staygreen competitor hybrid towards the end of the 2009-10 season. Note the far better plant health and much less lodging with G99.