

CROP SAFETY OF BOXER[®] GOLD AND CRUSADER

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AIM

To investigate the crop safety of new products Boxer[®] Gold (Syngenta) and Crusader (Dow).

BACKGROUND

Selectivity of Boxer[®] Gold in cereals is obtained by positioning herbicide away from the seed and by the ability of cereals to metabolise the herbicide to inactive compounds more rapidly than susceptible weed species.

Movement into the seed zone may induce crop damage from Boxer[®] Gold where heavy rainfall follows sowing, in the event of crop stresses including frost or in sandy soils with high leaching potential. Crusader, a group B post emergent grass herbicide, can cause transient stem shortening and crop yellowing but yield is normally unaffected.

Crusader was released in 2008 as a new post-emergent herbicide for the control of grass weeds and some broadleaf weeds in wheat. It has good activity on Brome grass, as well as wild oats and some activity on susceptible ryegrass. It also has good activity on many broadleaf weeds currently found in the WA cropping system. Use of Crusader can cause transient stem shortening and crop yellowing (when adverse growing conditions are experienced) but yield is normally unaffected.

TRIAL DETAILS

Property	Clint, Ian and Helen Hunt, Marchagee
Plot size & replication	4m x 5m x 3 replicates
Soil type	Sandy loam
Sowing date	10/5/08
Seeding rate	100 kg/ha
Fertiliser	10/5/08: 50 kg/ha Urea (IBS), 50 kg/ha Muriate of Potash (IBS), 100 kg/ha Agstar extra (DB) 7/6/08: 50 kg/ha Urea (TD)
Paddock rotation	2006 = Wheat; 2007 = Wheat
Herbicides, Insecticides & Fungicides	10/5/08: 2 L/ha Spray.Seed [®] , IBS & PSPE treatments 18/5/08: Post-emergent treatments 7/6/08: Post-emergent treatments 1/7/08: Post-emergent Group B treatments 12/7/08: 500 mL/ha Tilt [®]
Growing Season Rainfall	234mm

The trial was sown at 5.5kph, using a knife point + presswheel configuration on 9 inch row spacing with seed at 3cm and into moisture. Treatment #3 (Boxer Gold 2.5 L/ha pspe) was applied when the crop was at 5% germination (½ leaf). The group B treatments were crossplotted across the IBS treatments and were not applied until 1/7/08 (52 days after sowing).

RESULTS

Wheat in Boxer[®] Gold and Duet treatments were similar to the untreated control at 18 days after sowing, however there was a visual effect in the Trifluralin plots that was evident in each replicate. Plant numbers were significantly reduced in the Trifluralin treatment (table 1). Plot biomass was also significantly reduced in the Trifluralin treatment *cf.* Boxer[®] Gold and Duet (table 1).

Crop phyto-toxicity response from the application of group B herbicides were obvious at seven days after application, in the order Crusader > Atlantis > Monza. Plot biomass was not reduced by Monza[®] or Atlantis but use of Crusader resulted in a significant reduction of about 5% biomass (table 1). Crop damage from group B application appeared greater in Trifluralin treated plots compared with other IBS treatments, with Crusader showing the most damage of the group B's. Trifluralin + Crusader treated plots had reduced biomass, plant number and in general had shorter stems, but there was no interaction with main plot treatments (F(prob)=0.32ns), suggesting the crop damage from group B's did not increase when Trifluralin was used

upfront compared to the use of Boxer Gold® or Duet, and in particular the damage caused by use of Crusader was not exacerbated by previous IBS herbicides.

Table 1: Visual ratings for plant number and plot biomass.

IBS Treatment	Plant Number (% of control)	Visual rating of plot biomass for post-emergent group B treatments (% of control)				
		Untreated	Crusader 500 mL/ha	Monza 25 g/ha	Atlantis 330 mL/ha	Mean
Trifluralin 2.3 L/ha	81.7	91	82	86	91	87.4
Boxer Gold 2.5 L/ha (IBS)	97.3	97	95	98	97	96.6
Boxer Gold 2.5 L/ha (PSPE)	98.3	99	97	100	98	98.6
Boxer Gold 2.5 L/ha (Post-em)	96.0	98	92	99	97	96.3
Duet 2 L/ha	95.3	98	86	99	97	95.0
Mean	-	96.5	90.5	96.2	95.9	-
ANOVA for plant number	F(prob) < 0.001, LSD= 2.3, CV=5.8%					
ANOVA for plot biomass	Effect of main trt (IBS)- F(prob) = 0.010, LSD = 5.3					
Effect of sub plot	(Gp B)- F(prob) = 0.005, LSD = 2.7					
Interaction	F(prob) = 0.32, LSD = ns, CV = 4%					

Site mean yield was 2.88 t/ha. There was no significant difference in grain yield between main plots (Trifluralin v's BoxerGold v's Duet) or between the group B treatments (Table 2).

Table 2: Grain yield for each IBS and post-emergent treatment (t/ha).

IBS Treatment	Post-emergent group B treatments				Means
	Untreated	Crusader 500 mL/ha	Monza 25 g/ha	Atlantis 330 mL/ha	
Trifluralin 2.3 L/ha	2.68	2.54	2.60	2.84	2.67
Boxer Gold 2.5 L/ha (IBS)	2.85	2.84	2.98	3.06	2.93
Boxer Gold 2.5 L/ha (PSPE)	2.89	3.01	2.95	2.99	2.97
Boxer Gold 2.5 L/ha (Post-em)	3.01	3.08	3.11	3.00	3.05
Duet 2 L/ha	2.85	2.73	2.81	2.73	2.80
Means	2.86	2.84	2.89	2.93	2.88
Effect of main trt (IBS)-	F(prob) = 0.167, LSD = ns				
Effect of sub plot (Gp B)-	F(prob) = 0.823, LSD = ns,				
Interaction	F(prob) = 0.840, LSD = ns, CV=5.8%				

COMMENTS

- Trifluralin use resulted in significant crop damage at this site. This was surprising as crop safety has been shown at up to 3 L/ha for Trifluralin 480 g/L active rate in a minimum tillage situation. Plant number (visual rating) was significantly reduced and about 30% of emerged plants suffered a retardation of growth. This also highlighted the relative crop safety of Boxer® Gold, although the superior plant establishment from Boxer® Gold in this trial did not significantly improve yield.
- Crusader can cause early crop damage, and the label does warn about crop yellowing, but in general the crop will “grow out” of this damage in a matter of weeks. Although at this site Crusader reduced plot biomass significantly by about 5% compared with Monza or Atlantis and biomass reduction was present beyond tillering and stem elongation.
- Crop phyto-toxicity responses to the application of the group B's coincided with infection from Yellow Leaf Spot (*Pyrenophora tritici repentis*). It is possible that disease may have disguised the extent of crop damage resulting from herbicide use.
- To give the grower peace of mind, although Trifluralin and Crusader caused significant crop damage, there was no effect on crop grain yield, and the crop safety of Boxer Gold was a feature at this site.

- Please note: The product label for Boxer Gold specifies IBS use only, always follow the label.

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