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Cereal variety x weed competition – Trangie 2014

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Introduction

Herbicide resistance has led to a greater need for Integrated Weed Management (IWM). Growers are seeking non-herbicide options to help reduce weed competitiveness and seed-set. Crop competition is an important management tool in helping suppress weed growth in-crop. However, crop types and varieties differ in their competitive ability. In this trial a range of barley, wheat and triticale varieties were tested for their competitive ability against a known population of weeds (oats).

Site details

Location:	**Trangie**
Co-operator:	**Agricultural Research Station**
2013 crop:	**Field peas**
Soil type:	**Brown chromosol**
P (Colwell):	**35 mg/kg**
Total N:	**175 kg/ha (0–120 cm)**
PAW:	**~36 mm (0–120 cm in April)**
In-crop rainfall:	**142 mm from 1 May to 31 October**
Sowing date:	**12 June**
Fertiliser at sowing:	**70 kg/ha Granulock Supreme Z treated with 500 g/L of flutriafol**
Fertiliser post sowing:	**77 L/ha Easy N in July**
Harvest date:	**7 November**
Herbicides:	**Precept® at 1 L/ha (150 EC)**

Treatments

- 11 cereal varieties: All varieties sown to establish target plant populations of 100 plants/m^2 (100) and two varieties were also sown at a target of 200 plants/m^2 (200)
- All varieties were sown both with and without weeds (+/- treatments) aiming to establish 50 weed plants/m^2
- The varieties used were:
  - Barley: Buloke$^{\Phi}$, Commander$^{\Phi}$, Compass$^{\Phi}$, Gairdner$^{\Phi}$, GrangeR$^{\Phi}$, Scope CL$^{\Phi}$ (100 and 200), La Trobe$^{\Phi}$ (100 and 200), Urambie$^{\Phi}$
  - Wheat: Sunvale$^{\Phi}$, LRPB Spitfire$^{\Phi}$
  - Triticale: Canobolas$^{\Phi}$
- Weed: Yarran oats @ 50 plants/m^2 sown inter-row as a mimic weed

Results

- The barley varieties Scope CL$^{\Phi}$ and La Trobe$^{\Phi}$ suppressed weed seed-set down to around 100 kg/ha compared to the least competitive varieties (e.g. Urambie$^{\Phi}$) which allowed 500 kg/ha of weed seed-set.
- In this trial varieties such as Sunvale$^{\Phi}$ with less competitive ability lost up to 29% of their potential yield due to the presence of weeds (Oats @ 50 plants/m^2).

Key findings

The barley varieties Compass$^{\Phi}$, La Trobe$^{\Phi}$ and Scope CL$^{\Phi}$ were the highest yielding varieties in this trial in the presence and absence of weed pressure.

Increasing the plant population of La Trobe$^{\Phi}$, and Scope CL$^{\Phi}$ improved their relative yield where weeds were also present by 15% and 6%, respectively and further reduced weed seed-set.

La Trobe$^{\Phi}$, Scope CL$^{\Phi}$ and Compass$^{\Phi}$ were the most competitive varieties and provided greatest suppression of weeds.

Barley was generally more competitive with the mimic weed than wheat but large differences were apparent between varieties.

- Doubling the seed rate of two of the barley varieties; Scope CL$^{\Phi}$ and La Trobe$^{\Phi}$ (from 100 to 200 seeds/m^2) provided increased weed competition and improved the relative yield of the crop.
- The variety La Trobe$^{\Phi}$ responded well to increased target plant population. La Trobe$^{\Phi}$ yielded an additional 15% by increasing the plant stand from 100 to 200 plants/m^2 in the presence of weed competition. At 200 plants/m^2 La Trobe$^{\Phi}$ suffered only 8% yield loss from weed competition compared with 23% at 100 plants/m^2.

Summary

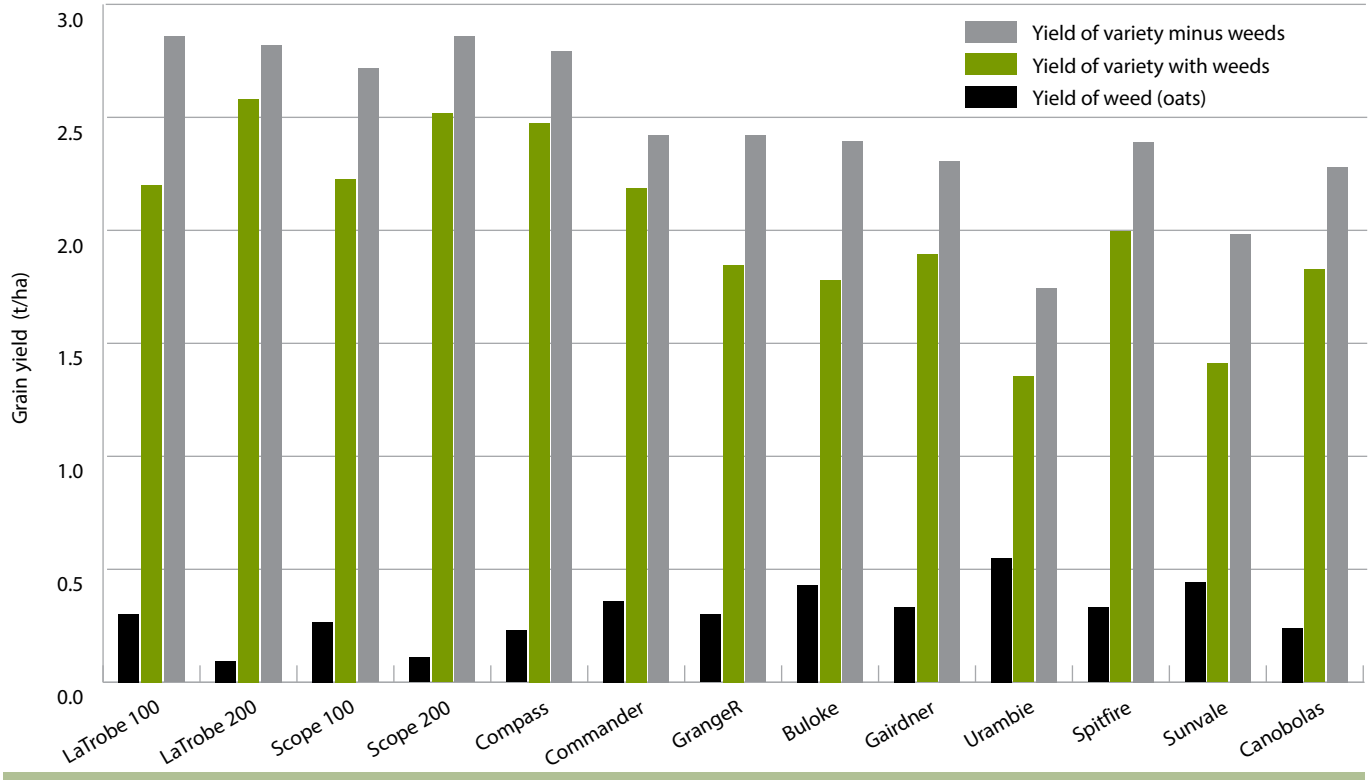

Figure 1. *Yield of variety with/without weeds, yield of weed (oats), L.S.D = 0.23 t/ha variety; 0.13 t/ha weeds=0.12 t/ha*

Variety selection can play an important role in Integrated Weed Management (IWM) strategies. Some varieties appear to have the capacity for high yield and increased weed competition. Weeds if left unchecked can produce significant quantities of seed which is returned to the seed bank for subsequent seasons as well as reducing the current crop yield.

Barley is generally more competitive than wheat but among barley varieties there are significant differences in their relative competitiveness with Compass$^{\Phi}$, La Trobe$^{\Phi}$ and Scope CL$^{\Phi}$ appearing better in this trial. Some wheat varieties e.g LRPB Spitfire$^{\Phi}$ out-yielded some barley varieties e.g. Urambie$^{\Phi}$ and also provided better weed suppression. The triticale variety Canobolas$^{\Phi}$, although sown later than ideal out-yielded some barley varieties and also provided better weed suppression. Canobolas$^{\Phi}$ has a quick erect growth features that assist in early weed competition. It was also the tallest variety at maturity reaching a greater height than the weeds.

Increasing plant population of the cereal crop both reduced the weed seed set and increased the crop yield in the presence of weed competition.

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