Effect of cultivar and seed weight on triticale competitiveness with annual ryegrass, *Lolium rigidum*

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Summary Herbicide resistance in weeds, particularly in annual ryegrass (*Lolium rigidum*), has been a major challenge in Australian cereal cropping systems over the last few decades. As a result, cultural weed control methods have increased in importance to complement herbicide strategies. One such method has been to grow more competitive crop species and varieties. Triticale (× Triticosecale) has high tolerance to environmental stress but has received limited research attention for improving competitive ability with weeds. One factor that has shown potential for enhancing crop competitive ability is that of seed size or seed weight. A glasshouse experiment was conducted to study the effect of crop seed size of three triticale cultivars (Tuckerbox, KM10 and Bogong) and one comparative wheat cultivar (Spitfire) on their competitive ability with annual ryegrass. Seeds of each cultivar were divided into three seed size categories (small, standard and large), and grown in competition with ryegrass (weed-free (4:0), weedy (4:3 and 4:6) plants per pot) up to crop anthesis. The larger crop seed size increased crop height, leaf area and biomass, and significantly reduced ryegrass dry weight by 20%. In terms of crop or weed biomass, seed size did not interact with cultivar or competition level, indicating that the seed size effect was consistent. These findings suggest that selecting larger triticale seeds through more comprehensive grading is likely to confer the crop with greater competitive advantage against annual ryegrass (and presumably other weeds) during their early growth. Triticale was also less sensitive to ryegrass competition than the comparative wheat variety. More detailed studies are needed with a larger variety of wheat and triticale cultivars under both glasshouse and field conditions to better understand how, why and when large seeded crop plants are more competitive with weeds, and how they can be better utilised under Australian farming conditions.

Keywords Triticale, competition, annual ryegrass, seed weight