Chickpea Variety Trial Yield and Composition, 2007

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Abstract

Chickpeas are a potential rotation crop in central Oregon that use minimal water and reduce the nitrogen fertilizer required for a following crop. This study was conducted to determine which cultivars would be suited to the local environment. Variety trials of 14 cultivars and advanced breeding lines were conducted at two locations in central Oregon. Seed set was poor at Powell Butte, where the trial was almost abandoned. At the other location, yields and seed size were large enough to make the crop profitable, and if ascochyta blight can be controlled, central Oregon holds promise as a source of large seed chickpeas.

Introduction

With their adaptation to dry, cool growing conditions and their high value when produced at premium quality, chickpeas (*Cicer arietinum*) are a potential rotation crop for central Oregon. Chickpeas have been grown in central Oregon under contract for approximately $0.35/lb, although larger chickpeas are marketed around the world in excess of $0.45/lb. With yields typically between 1,500 and 2,000 lb/acre, as well as their ability to contribute to soil nitrogen, they present themselves as a viable rotational crop. Given the low level of disease resistance in kabuli chickpeas, ascochyta blight presents a considerable challenge to growing the crop in central Oregon.

Methods and Materials

Two variety trials were conducted within commercial fields of chickpeas at the Central Oregon Agricultural Research Center at Madras (44.68°N, 121.15°W, 2,424 ft elevation) and Powell Butte (44.15°N, 120.57°W, 3,175 ft elevation). Both trials were organized as randomized complete blocks with four replications. Plots measured 20 ft long by 4 ft wide. There were 6 rows per plot, and the first and sixth rows and 2 ft at the ends of each plot were removed prior to harvest. At both sites one desi ('Myles') and three kabuli ('Dwelley', 'Dylan', and 'Sierra') cultivars were included along with six kabuli breeding lines from Washington State University's chickpea breeding program, as well as two commercially grown kabuli cultivars ('HB14' and 'HB19') provided by the Kelly Bean Company (KBC), and two extra-large-seeded cultivars ('Macarena' and 'Kimberley Large'). Seed was treated with Ridomil® (Syngenta), Mertect® (Syngenta), and Maxim® (Syngenta) at recommended rates and sown at 6 seeds/ft^2 (approximately 290 kg/ha or 260 lb/acre) at a depth of 1.5 inches. Both trials were sown using a tractor-mounted cone-seeder. Trials at both locations were irrigated using hand-line sprinklers. The Madras trial was sown on April 11, 2006. On April 19 all plots were sprayed with a mixture of herbicides (4 oz/acre of Spartan® 4F, 12 oz/acre Outlook®, and 2 pt/acre grounded surfactant), and the following day all plots were irrigated with 0.5 inch of water. All plots were sprayed with Pristine® at 6 oz/acre June 7 and July 9 and Bravo® Weatherstik at

2pt/acre (June 25) in order to control ascochyta . The trial was direct harvested on September 26, 2006 using a small plot combine. The trial at Powell Butte was sown on April 17. The following day it was treated with the same mixture of herbicides that was used at Madras and then irrigated with 0.5 inch of water. All plots were sprayed with Pristine® at 6oz/acre June 7 and July 10 and Bravo® Weatherstik at 2pt/acre on June 27. Plots were harvested on November 6 using a small plot harvester.

Results and Discussion

Despite the regular application of fungicide, the trial at Powell Butte produced very little seed. Poor weather in October delayed harvest although the crop remained green and it did not appear as though the crop set many seeds. Yield was commercially unacceptable although seed weight was high (Table 1). Yields were much higher at Madras, and at current prices several of the elite lines would be profitable. The cultivar Macarena was the highest yielding line, although not significantly greater than several other elite cultivars, and it also produced the largest seed. This variety is valued for its size and color when marketed internationally and attracts a premium price. Although its ascochyta blight resistance is poor, the results from the Madras site indicate that if this disease can be controlled, this cultivar can be successfully produced in central Oregon.

Table 1. Yield (lb/acre) and 1,000-seed weight (g) of chickpeas grown at Madras and Powell Butte, Oregon, in 2007.

	Madras		Powell Butte	
Cultivar	Yield (lb/ac)	1,000-seed wt (g)	Yield (lb/ac)	1,000 seed wt (g)
Dwelley	3492	51.83	708	56.55
Dylan	3720	58.80	466	62.77
Sierra	3039	54.55	565	59.40
CA9783163C	3116	56.68	372	54.27
CA9990B1579C	3252	55.38	775	56.58
CA0090B347C	3865	49.25	*	*
CA0190B839C	2829	56.03	511	59.15
CA9890233W	3087	53.38	447	56.83
CA9990I875W	2698	54.23	*	*
Myles	3194	21.50	495	21.60
HB14	3435	51.53	489	53.15
HB19	3677	58.83	415	59.60
Macarena	3982	63.60	363	59.30
Kimberley Large	3830	59.43	269	43.73
LSD (0.05)	757	3.33	284	10.69

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