

## Chickpea and Lentil Seeding Rate Study

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Chickpea and lentil seeding rates were investigated for seeding rates that could increase crop stand establishment, time to canopy development and ultimately, weed competitiveness and productivity. Both studies were planted in the spring of 2018 near Pullman, WA, at the Cook Agronomy Farm. For the chickpea study variety 'Billy Bean' was planted May 15, 2018 and for the lentil study variety 'Pardina' as planted May 16, 2018 using a nine row Monosem NG4+ planter with openers spaced 10" and calibrated to deliver seeding rate treatments. Seeding rates are detailed in Table 2 and 3. Each study was conducted in a randomized complete block design with 3 replications, plots were 8' by 75' long. Stand counts were approximately 20 days after planting (DAP) within each plot. Leaf area index (LAI) were evaluated 45 DAP. Lentil plots were harvested on September 5, 2018 and Chickpea plot were harvested on September 7, 2018 using a plot combine. The chickpea study was treated with PRE herbicides (Outlook 21 fl oz A<sup>-1</sup>, Spartan 4F 8 fl oz A<sup>-1</sup>, GlyStar 28 fl oz A<sup>-1</sup>, NIS 0.25% v/v, and AMS Max 10 lb A<sup>-1</sup>) after seeding. The lentil study was also treated with PRE herbicides (Metribuzin 75DF 0.5 lb A<sup>-1</sup>, Lorox DF 1.5 lb A<sup>-1</sup>, Prowl H2O 2 pt A<sup>-1</sup>, GlyStar 28 fl oz A<sup>-1</sup>, NIS 0.25% v/v, and AMS Max 10 lb A<sup>-1</sup>) after seeding. Both studies were blanket sprayed with Roundup PowerMax (48 fl oz A<sup>-1</sup>), NIS (0.25% v/v), and AMS (117

lb/100 gal) for preharvest burndown. All data were subjected to an analysis of variance using the statistical package built into the Agricultural Research Manager software system (ARM 8.5.0, Gylling Data Management).

### Results

#### Chickpea

Stand counts increased as the seeding rate increased for treatments 1 through 4, with 20 plants m<sup>-1</sup> at the 2.3 seed ft<sup>-1</sup> treatment and 36 plants m<sup>-1</sup> for the 5.3 seed ft<sup>-1</sup> seeding rate. However, the higher seeding rates (treatment 5 – 8) were planted using pea plates. There was insufficient vacuum to hold the chickpea seed to the seed plat, causing lower seeding rate being planted than desired (Table 2). There were no differences in leaf area index (LAI) at 45 DAP and yield for any seeding rate (Table 2). Although there was no difference in yield, there was a reduction in yield as seeding rate increased. The lowest seeding rate of 2.3 seed ft<sup>-1</sup> produced 2080 lb A<sup>-1</sup> yield and the highest seeding rate produced 1680 lb A<sup>-1</sup> yield (Table 2).

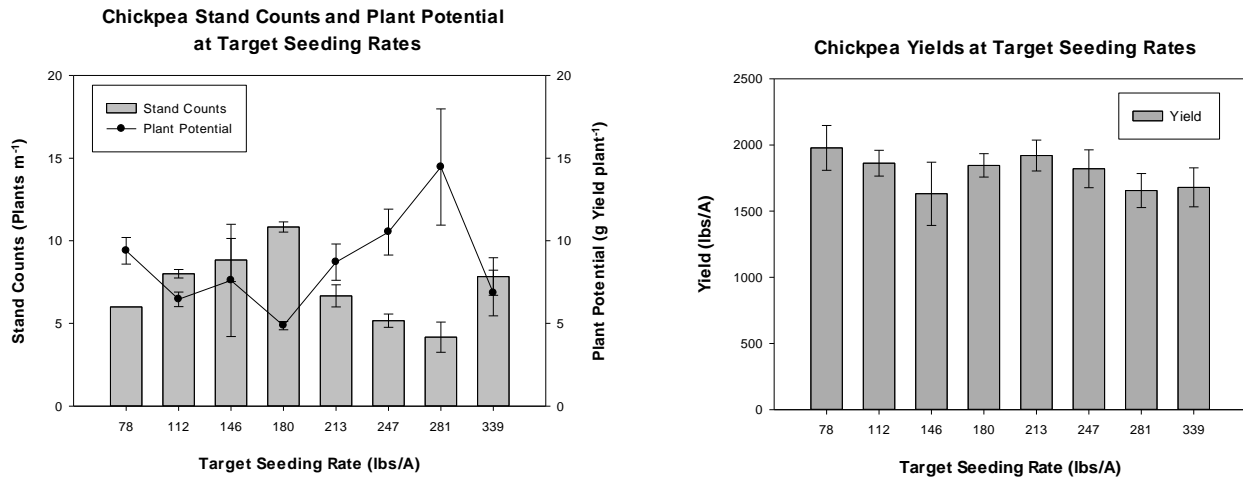


**Figure 1.** Chickpeas 20 days after planting (DAP). Left: Lowest seeding rate of 78 lbs A<sup>-1</sup>. Right: 180 lbs A<sup>-1</sup> seeding rate.

**Table 2.** Stand counts, leaf area index (LAI), and yield for the chickpea seeding rate study (Billy Bean). Pullman, WA, 2018. DAP = days after planting. Means followed by the same letter are not statistically significantly different ( $\alpha=0.05$ ).

Trt	Seeding Rate			June 4, 2018	June 29, 2018	September 7, 2018
	seed/m	seed/ft	lb/A	Stand Counts	LAI	Yield
				plants/m	#	lb/A
1	8	2.3	78	20 cd	1.3	2080
2	11	3.3	112	26 bc	1.1	1960
3	14	4.3	146	30 b	0.8	1720
4	17	5.3	180	36 a	1.3	1850
5	21	6.3	213	23 bcd	1.4	1920
6	24	7.3	247	16 d	1.4	1820
7	27	8.3	281	13 d	1.1	1660
9	33	10	339	26 bc	1.3	1680
			LSD	6	1.12	438.50

**Figure 2.** Chickpea stand counts (plants m<sup>-1</sup>) and plant potential (g Yield plant<sup>-1</sup>) [left] and yields [right] at target seeding rates.



### Lentils

Stand counts at 20 DAP increased as the seeding rate increased. The lowest seeding rate of 4.8 seed ft<sup>-1</sup> had 5 plant m<sup>-1</sup>, and the highest seeding rate had 33 plants m<sup>-1</sup> (Table 3). There were no differences in leaf area index (LAI) for any seeding rate (Table 3). Yield was the greatest for 26 plants m<sup>-1</sup> seeding rate with 1020 lb A<sup>-1</sup>. The second greatest yield was 790 lb A<sup>-1</sup> at the 36 plants m<sup>-1</sup>. The lowest seeding rate had the lowest yield of 260 lb A<sup>-1</sup> (Table 3).



**Figure 3.** Lentils 20 days after planting (DAP). Left: Lowest seeding rate of 22 lbs A<sup>-1</sup>. Right: Highest seeding rate of 111 lbs A<sup>-1</sup> seeding rate.

**Table 3.** Stand counts, leaf area index (LAI), and yield for the lentil seeding rate study (Pardina). Pullman, WA, 2018. DAP = days after planting. Means followed by the same letter are not statistically significantly different ( $\alpha=0.05$ ).

T rt	Seeding Rate			June 4, 2018 (20 DAP)	June 28, 2018 (45 DAP)	September 5, 2018 (112 DAP)
	seed/ m	seed/ft	~ lb/A	Stand Counts	LAI	Yield
				plants/m	#	lb/A
1	16	4.8	22	5 a	1.0	260 c
2	17	5.2	24	5 a	1.3	400 bc
3	19	5.8	27	5 a	0.9	410 bc
4	24	7.2	33	5 a	0.9	420 bc
5	26	8.0	37	15 b	1.0	1020 a
6	36	11.1	51	19 b	0.8	790 ab
7	52	16.0	74	28 c	1.0	750 abc
9	79	24.0	111	33 c	0.6	720 abc
			LSD	5.08	0.66	322.07

**Figure 4.** Lentil stand counts (plants m<sup>-1</sup>) and plant potential (g Yield plant<sup>-1</sup>) [left] and yields [right] at target seeding rates.

