



# CHICKPEAS

## *A Potential New Pulse Crop for Northern Idaho*

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Chickpeas (*Cicer arietinum* L.) are large-seeded, legume seed crops which are currently grown in India, Pakistan, Spain, Algeria, Mexico and California. These and other areas produce nearly 8 million tons of this crop annually, but the U.S. produces only 3,500 tons.

Chickpeas are better known in this country as "Garbanzo Beans," a popular item in most salad bars. Mexican imports are currently helping satisfy domestic markets. If a significant acreage of this crop was grown in northern Idaho, production could be sold to both domestic and export markets.

Chickpeas are a spring-seeded annual with a growth habit similar to that of lentils. Most commercial varieties have white flowers and produce inflated pods that contain one to two seeds.

Chickpeas are susceptible to a wilt caused by *Fusarium oxysporum* f. sp. *ciceri*, several forms of root rot, and a foliar blight caused by *Ascochyta rabiei*. Potential severity of these diseases is unknown in this production area. Chickpeas do not appear to be susceptible to either the pea leaf weevil or pea weevil.

### *Variety Trial*

The nursery area at Moscow, Idaho, was treated with 0.5 pounds (a.i.) Treflan (trifluralin) and 1¼ quarts of Avadex (triallate) per acre as preplant incorporated herbicides. Seed of the 18 cultivars was treated with Orthocide 4 (captan) to prevent seed decay prior to planting. The plots were seeded on May 1. *Rhizobium* inoculum obtained from Nitragin Company was incorporated into the soil surface with a hand rake. The plot area was sprayed with Premerge 3 (dinoseb amine) at 2 gallons (a.i.) per acre prior to the emergence of the seedling for additional broadleaf weed control.

The varieties were harvested on Sept. 9 by placing the plant vines in burlap sacks. The sacks were air-dried for 2 weeks to simulate swathing before the seed was thrashed with a small plot combine.

The stands of the plots ranged from 124,000 to 434,000 plants per acre, but stand did not appear to have an effect on seed yield (Table 1). By July 7 most of the varieties had more than 50 percent bloom. Four cultivars from the Canadian collection and the



Fig. 2. Mature chickpeas inspected during variety trials at Moscow in early September, 1980.

land race "Weyen," obtained from Mr. Weyen at Kendrick, Idaho, were just beginning to bloom. All varieties had an erect growth habit similar to that of lentils. The varieties ranged from 13 to 24 inches in height. Most of the pods were at nodes 3 to 4 inches from the soil surface which would allow swathing or direct harvest without seed shatter. When plants were scored for maturity prior to harvest on Sept. 9, many of the varieties were still too green to allow direct harvest.

Variety seed yields ranged from 3,180 to 1,900 pounds of seed per acre (Table 1). Top yielding varieties "Spanish Common," "UC 5," "NEC 1527," "Mission" and "IC 9368" averaged 2,930 pounds of

seed per acre. The variety Weyen yielded 2,450 pounds per acre.

Variety seed size ranged from 710 to 2,950 seeds per pound. Large seed size is necessary in chickpea varieties used for processing into "Garbanzo Beans." Large seeded varieties such as Spanish Common, UC 5 and Mission would require more than 240 pounds of seed per acre to establish stands equivalent to those in this trial. Seed costs would probably require that fewer plants be established per acre in commercial production. Most conventional grain drills could not plant the large seed cultivars without cracking a high percentage of the seed.

Table 1. Agronomic performance of 18 varieties of chickpeas grown at Moscow, Idaho, in 1980.

Variety	Source	Stand (1,000 plants/acre)	Bloom July 7 (%)	Height (inches)	Maturity <sup>1</sup> Sept. 9 (score)	Seed yield (lb/acre)	Seed weight (seeds/lb)
Spanish Common	California	248 c-f <sup>2</sup>	63 cd <sup>2</sup>	19 bc <sup>2</sup>	2.3 bcd <sup>2</sup>	3,180 a <sup>2</sup>	870 c <sup>2</sup>
UC 5	California	212 def	60 cde	18 cd	1.7 cd	3,020 ab	830 b
NEC 1527	Canada	292 b-f	95 ab	17 cd	1.3 cd	2,880 abc	1,250 e
Mission	California	186 ef	60 cde	21 abc	3.0 bc	2,820 a-d	820 b
IC 9368	Canada	416 ab	0 g	18 cd	3.0 bc	2,750 a-e	2,390 i
IC 8129	Canada	328 a-d	100 a	17 cde	1.0 d	2,670 b-f	2,090 h
IC 7519	Canada	319 a-e	13 g	24 a	1.3 cd	2,670 b-f	1,680 f
IC 7520	Canada	407 ab	15 g	24 ab	1.0 d	2,660 b-f	1,630 f
IC 9413	Canada	434 a	43 ef	19 bc	3.7 ab	2,480 c-f	2,280 i
IC 9398	Canada	354 abc	5 g	17 cd	3.0 bc	2,460 c-f	2,430 i
CA 404	Canada	319 a-e	90 ab	21 abc	2.0 cd	2,460 c-f	1,060 d
Weyen	Idaho	310 a-f	20 fg	22 abc	1.0 d	2,450 c-g	1,240 e
85-23	India	407 ab	85 ab	17 cd	1.7 cd	2,350 d-g	2,950 j
FIG 151	California	212 def	97 ab	16 cde	1.3 cd	2,300 efg	710 a
IC 9419	Canada	354 abc	77 bc	21 abc	4.7 a	2,250 efg	1,870 g
85-22	India	363 abc	92 ab	13 e	1.0 d	2,240 fg	2,840 j
85-21	India	381 abc	88 ab	13 de	1.5 cd	2,230 fg	2,810 j
85-24	India	124 f	90 ab	16 cde	1.7 cd	1,900 g	1,710 f

<sup>1</sup>Maturity score: 1 = ready to harvest; 5 = green and succulent.

<sup>2</sup>Means within a column not followed by the same letter differ at the 0.05 level of probability by Duncan's new multiple range test.



Fig. 3. Chickpea variety trials inspected at Moscow in early July, 1980.

### Planting Date

Two varieties of chickpeas were planted April 16, April 24, May 2 and May 10 at Moscow. The experiment was conducted using the same procedure as described for the variety trial, except the application of Premerge 3 (dinoseb amine) was omitted to avoid the effect of herbicide and date of application interactions. Weeds were controlled by hand.

The planting date did not influence the establishment of chickpeas, but the Spanish Common seed produced consistently higher plant populations than the variety FIG 151 (Table 2). Early seeding allowed the plants to flower in late June. Early planting also produced the highest seed yields. The

average seed yield of both varieties was 3,300, 2,720, 2,630 and 1,830 pounds per acre for the plantings April 16, April 24, May 2 and May 10 respectively. Delaying planting from April 16 to May 10 reduced seed yields by 55 percent. Successful chickpea production would require seeding as early as possible in the spring.

### Weed Control

Chickpea, because of its growth habit, is susceptible to many weed species that are common in pea fields. Weeds such as mayweed, lambsquarter, field pennycress and wild oat can pose an economic threat to production.

Table 2. Agronomic performance of two varieties of chickpeas planted at four dates in the spring of 1980 at Moscow, Idaho.

Planting date	Variety	Stand	Bloom	Seed	Seed
		(1,000 plants/acre)	June 30 (%)	yield (lb/acre)	weight (seeds/lb)
April 16	Spanish Common	358	89	3,490	920
	FIG 151	332	83	3,100	770
	Average	345 a <sup>1</sup>	86	3,300 a <sup>1</sup>	840 a <sup>1</sup>
April 24	Spanish Common	378	21	3,050	880
	FIG 151	285	45	2,500	790
	Average	332 a	33	2,770 a	830 a
May 2	Spanish Common	392	0	2,680	910
	FIG 151	352	0	2,590	740
	Average	372 a	0	2,630 ab	820 a
May 10	Spanish Common	505	0	2,030	970
	FIG 151	325	0	1,640	810
	Average	412 a	0	1,830 b	890 a

<sup>1</sup>Means within a column not followed by the same letter differ at the 0.05 level of probability by Duncan's new multiple range test.

Table 3. Effect of eight herbicide treatments on weed control, crop damage and seed yield of "Spanish Common" chickpeas at Moscow in 1978.

Treatment <sup>1</sup>	Type of application	Crop damage		Weed species			Seed yield (lb/acre)
		Stand	Vigor	Mayweed	Lambsquarter	Field Pennycress	
		(% reduction)		(% control)			
Metribuzin (0.5) + Triallate (1.25)	PPI <sup>2</sup>	2 b <sup>3</sup>	5 b <sup>3</sup>	100 a <sup>3</sup>	100 a <sup>3</sup>	100 a <sup>3</sup>	3,130 a <sup>3</sup>
Dinoseb (9.0)	PES	3 b	0 b	100 a	100 a	100 a	2,860 a
Dinoseb (9.0) + Dinoseb (2.0)	PES/post	22 b	12 b	100 a	100 a	100 a	2,320 ab
Profluralin (0.5)	PPI	5 b	12 b	10 b	0 c	0 b	820 bc
Trifluralin (0.5) + Triallate (1.25)	PPI	20 b	7 b	23 b	57 ab	27 b	760 bc
Diclofop methyl (0.75)	Post	10 b	7 b	0 b	0 c	0 b	657 bc
Trifluralin (0.5)	PPI	8 b	10 b	0 b	42 bc	0 b	531 b
Check	—	0	0	0	0	0	373 c
MCPA	pre-bloom	72 a	55 a	33 b	100 a	90 a	69 c

<sup>1</sup>Chemical rates (0.5) given in pounds of active ingredient per acre.

<sup>2</sup>PPI — preplant incorporated; PES — premergent to the crop; Post — sprayed on emerged crop.

<sup>3</sup>Means within a column not followed by the same letter differ at the 0.05 level of probability by Duncan's new multiple range test.

Herbicide trials were conducted for the control of mayweed, lambsquarter and field pennycress at Moscow in 1980. No herbicides are now labeled for chickpea production in Idaho. However, compounds such as dinoseb, metribuzin and triallate gave total control of the broadleaf weeds and increased seed yields by more than 800 percent in comparison to the untreated control plots (Table 3). State-local-need labels can be sought for compounds that provide consistent weed control and high crop tolerance in chickpeas.

### Future Plans

During the spring of 1981, small acreage commercial test plots will be established at selected locations in northern Idaho. Trials will be established to determine optimum plant populations, varietal performance, herbicide effectiveness, potential disease problems, prevalence of insect pests and equipment modifications necessary to plant and harvest this crop.

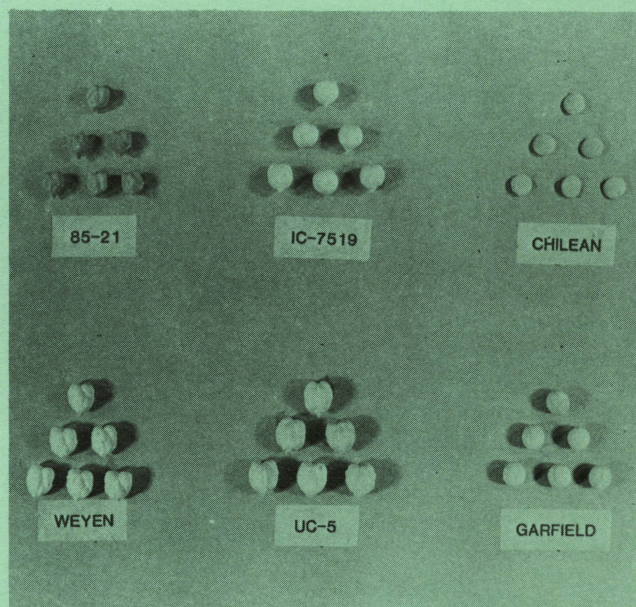


Fig. 4. Relative seed size and color is apparent in this comparison display of six chickpea varieties tested in trials at Moscow in 1980.

*The use of herbicides mentioned in this publication does not constitute a recommendation by the University of Idaho. Growers should insure that label directions are followed before applying any agricultural chemical.*

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