

CHICKPEA VARIETY TRIALS

Objective: To evaluate chickpea varieties for yield and adaptation to western South Dakota.

Procedure: Chickpea varieties were planted in a randomized complete block experiment with four replications near Oelrichs, Hayes and Wall, South Dakota. Most of the varieties are large kabuli types, which are grown for the large seeded garbanzo bean market. Two of the varieties (Amit and Chico) are a smaller sized kabuli for export into the desi market. The other varieties are desi types, which accounts for 85-90% of the market outside the United States and is grown as a protein source for humans and livestock. Large kabuli types used a planting rate of 130,000 seeds/A (120-160 Lb/A), small kabuli and desi types 174,000 seeds/A (75-110 Lb/A). The plots were planted in April and May with a John Deere 750 drill set to 10-inch row spacing and inoculated with chickpea inoculum (*Mesorhizobium* sp. *ciceri*) just prior to planting. The plots were harvested in July-September with a small plot combine.

Pennington County - Wall

Planted: April 10, 2003 Herbicide: Treflan 4L (2 pint/A)
Harvested: August 4, 2003 Additional Nitrogen: Inoculated
Previous crop: Conventional fallow

Fall River County - Oelrichs

Planted: April 18, 2003 Herbicide: Treflan 4L (2 pint/A)
Harvested: September 2, 2003 Additional Nitrogen: Inoculated
Previous crop: Conventional fallow

Stanley County - Hayes

Planted: April 10, 2003 Herbicide: Spartan
Harvested: July 29, 2003 Additional Nitrogen: Inoculated
Previous crop: Hayed wheat, No-till planted

Discussion: Chickpea yields were decent in 2003, though somewhat hampered by the drought conditions. Hayes, Wall and Oelrichs averaged 1242, 1003 and 552 Lb/A respectively. Chickpeas are a fairly deep rooted crop and were able to use the stored soil moisture from the previous fall precipitation. The low yields at Oelrichs were at least partially due to the late planting date in combination with the very dry summer. The best large kabuli varieties in 2003 were CDC Xena, CDC Diva and Sierra. As is shown in Table 28, seed size is very important to the price of large kabuli varieties. This information shows that CDC Xena, CDC Diva, Sierra and Dwelly would be good choices, while CDC Yuma and Evans would not be due to their large percentage of seed smaller than 22/64 in size. The varieties Amit and Chico also did well in 2003 and would be another option as markets are available for the small kabuli. The desi chickpeas typically have good yields in South Dakota but currently have a very limited market in the United States. Chickpeas are well adapted to the dry, semi-arid climate of South Dakota and can be a profitable crop if quality characteristics are met.

Table 26. Chickpea Variety Characteristics.

Variety	Seed Color	Height Inches	Lodging 1-9*	Test Wt Lb/Bu
Large Kabuli				
Dwelly	Cream	15	1	57.8
Evans	Cream	17	1	59.2
Sanford	Cream	17	1	58.9
Sierra	Cream	16	1	58.6
CDC Diva	Cream	15	1	59.4
CDC Yuma	Cream	16	1	59.1
CDC Xena	Cream	14	1	59.7
Small Kabuli				
Amit (B-90)	Cream	15	1	61.4
Chico	Cream	14	1	60.1
Desi				
CDC Anna	Brown	14	1	61.0
CDC Desiray	Brown	13	1	57.8
Myles	Brown	12	1	56.5
CDC Nika	Brown	14	1	60.6
Large Kabuli experimentals				
CA9783163C	Cream	14	1	55.6
CA9890169W	White	14	1	55.9
CA9890233W	White	14	1	55.7
CA9890239W	White	14	1	54.8
CA99901604C	Cream	14	1	56.2
CA99901861W	White	15	1	56.4
CA99901875W	White	14	1	55.3
CA9990B1514C	Cream	16	1	58.3
CA9990B1579C	Cream	16	1	58.5
CA9990B1895C	Cream	15	1	60.3
Average		15	1	58.1

*1=No lodging, 9= 100% lodged.

Table 27. Chickpea Variety Trial Yields (Lb/A), 2003.

Variety	Hayes	Wall	Oelrichs		Average
	2003	2003	2003	3-year	
<i>Large Kabuli</i>					
Dwelly	967	824	376	1094	722
Evans	1168	985	543	1228	899
Sanford	1285	838	448	1162	857
Sierra	1228	1116	551	.	965
CDC Diva	1309	1108	714	.	1044
CDC Yuma	1072	1114	540	.	909
CDC Xena	1362	1107	730	1303	1066
<i>Small Kabuli</i>					
Amit (B-90)	1424	1008	499	1170	977
Chico	1414	1143	771	1357	1109
<i>Desi</i>					
CDC Anna	1482	1071	769	.	1107
CDC Desiray	1340	1029	760	.	1043
Myles	1322	944	607	.	958
CDC Nika	1412	1175	829	.	1139
<i>Large Kabuli experimentals</i>					
CA9783163C	1049	879	411	.	780
CA9890169W	1257	961	516	.	911
CA9890233W	1012	810	273	.	698
CA9890239W	941	743	332	.	672
CA9990I604C	1450	1237	708	.	1132
CA9990I861W	1148	1000	384	.	844
CA9990I875W	1019	809	254	.	694
CA9990B1514C	1313	1053	571	.	979
CA9990B1579C	1295	1024	587	.	969
CA9990B1895C	1291	1085	525	.	967
Average	1242	1003	552	1219	932
LSD (P=.05)	184	149	152	94	101
CV	10.5	10.5	19.4	9.5	13.9

Table 28. Chickpea Seed Size and Gross Income per Acre.

Variety	Avg Yield 2003 Lb/A	Percent Seed Size					Gross Income \$/A
		over 24/64 \$0.21*	over 22/64 \$0.18	over 20/64 \$0.13	over 18/64 \$0.05	under 18/64 \$0.00	
Dwelly	722	26%	45%	23%	5%	1%	\$121.39
Evans	899	9%	37%	42%	11%	2%	\$129.69
Sanford	857	19%	44%	29%	8%	1%	\$136.67
Sierra	965	28%	49%	18%	4%	1%	\$166.97
CDC Diva	1044	20%	47%	28%	5%	1%	\$171.95
CDC Yuma	909	9%	38%	38%	12%	3%	\$128.86
CDC Xena	1066	26%	43%	25%	6%	0%	\$177.82
Amit (B-90)	977	0%	0%	13%	45%	42%	\$73.86**
Chico	1109	0%	1%	15%	54%	30%	\$83.84**

* Example price per pound for different sizes of chickpeas.

** Small kabuli types are not sold into the garbanzo bean market, gross income based on \$7.56/cwt loan rate for small chickpeas under 20/64.

