

PROJECT TITLE: Evaluation of spring einkorn for yield and resistance to lodging, Moccasin CARC and Huntley SARC 1996

PROJECT LEADER: G.F. Stallknecht

PROJECT COOPERATORS: Darrell Wesenberg, Harold Bockelman, USDA  
ARS Small Grains Germplasm Center,  
Aberdeen, Idaho  
Pierre Hucl, Plant Geneticist, Crop  
Development Center, Plant Science Dept.,  
Univ. Saskatchewan, Saskatoon, Sask.  
Joe Vavrovsky, Technician, CARC

OBJECTIVES: To evaluate einkorn plant introduction (PI) selections for yield and quality as a specialty grain crop for Montana.

RESULTS: Yield data for the 1996 sites are presented in Tables 1 and 2. Yields in pounds/acre ranged from 1962 to 923 and from 2470 to 1050 for the Moccasin and Huntley sites respectively. Lewis barley and Newana spring wheat produced the highest yields at Moccasin, while Lewis barley produced the highest yield at Huntley, and Newana wheat yielded among the lower yielding einkorn selections. Several einkorn selections out-yielded Otana oats at both test sites. Yields among the einkorn PI selections was not consistent between the two sites. Two PI selections, PI 272560, and PI 377662 were in the top ten yields at both sites, and one selection from Canada, T 24, was among the top ten yielders. Lewis barley yielded 1,186 lbs higher than the top einkorn selections at Huntley and 295 lbs higher at Moccasin.

SUMMARY: Seven of the higher-yielding einkorn selections in 1996 were also among the higher yielding selections in the previous test years of 1992-95. Yield comparisons to Lewis barley, Newana spring wheat and Otana oats resulted in Lewis barley producing the highest yields in the trials, while several einkorn PI selections out-yielded Newana spring wheat. The higher yielding einkorn selections produced yield levels which, as a specialty grain crop, could compete with the traditional cereals.

FUTURE PLANS: Interest in the development of new einkorn germplasm for high yields and good baking quality has recently increased in Europe and also in Canada. The high protein, high beta-carotene, unique flavor and non allergenic considerations of the diploid wheat species has stimulated increased interest in einkorn development. Studies on einkorn variety development will continue in cooperation with the Canadian research program, and hopefully with several European programs.

Table 1 1996 Spring Einkorn Trial  
Exp.EK07 Central Agricultural Research Center, Moccasin, MT.

ID#	Variety	Head Date	Plant Ht.	Grain Yield
		day	"	lbs/a
31	LEWIS	181.00	24.67	2257.33
32	NEWANA	184.67	23.00	1999.33
3	PI 94740	186.00	27.67	1962.67
5	PI 182461	190.00	29.67	1589.67
28	TM 24	193.00	27.33	1575.67
4	PI 167615	191.00	28.33	1551.67
24	PI 378469	190.33	35.00	1539.67
11	PI 272560	188.33	27.67	1498.67
30	TM 23	192.00	29.00	1441.00
6	PI 182462	190.00	30.00	1410.00
25	CI 7686	191.00	32.33	1399.67
33	OTANA	184.67	29.33	1390.00
21	PI 377662	189.33	28.33	1387.33
8	PI 190947	193.00	25.67	1385.33
10	PI 266844	191.67	31.33	1357.67
9	PI 264935	191.67	30.67	1353.00
16	PI 355526	191.33	30.67	1348.67
22	PI 538722	192.67	29.33	1338.67
2	CI 14520	191.00	28.33	1325.33
27	TM 28	185.00	30.33	1321.67
20	PI 362616	189.33	26.33	1306.67
26	TM 168	186.33	26.67	1300.33
23	PI 538723	192.00	28.67	1282.67
14	PI 352482	191.00	30.00	1258.00
15	PI 355516	191.00	29.67	1258.00
1	CI 13963	186.67	28.00	1257.00
12	PI 272561	194.00	29.00	1250.33
17	PI 355544	195.00	28.67	1209.67
13	PI 290511	195.00	30.00	1104.00
7	PI 190945	193.33	24.00	1102.67
19	PI 355548	196.00	32.33	1096.00
18	PI 355547	195.00	25.67	1033.00
29	TM 639	191.33	28.67	923.00
EXPERIMENTAL MEANS		190.41	28.68	1388.31
F TEST FOR VAR. df=64		110.81	2.88	4.01
C.V. 1: (S/MEAN)*100		.30	8.79	16.83
LSD (0.05)		.93	4.11	381.10

Table 2 1996 Spring Einkorn Trial  
Exp.EK08 Southern Agricultural Research Center, Huntley, MT.

Variety	ID#	Plant Ht.	Grain Yield	
		"	lbs/a	
Lewis	31	31	***** 3656.	N
PI 272560	11	30	***** 2470.	M
PI 362616	20	28	ABCDE 2435.	LM
PI 355547	18	34	***** 2334.	LM K
Otana	33	33	***** 2277.	LM J K
PI 538722	22	34	***** 2275.	LM J K
PI 352482	14	32	***** 2261.	LM J K
CI 14520	2	33	***** 2249.	LM J K
TM 168	26	30	***** 2218.	LM J IK
PI 355544	17	32	***** 2206.	LM J IK
TM 24	28	33	***** 2174.	LM J IK
PI 377662	21	29	ABCDEFGH 2147.	LM J IK
PI 264935	9	33	***** 2136.	LM JHIK
PI 167615	4	31	***** 2071.	L GJHIK
TM 23	30	30	***** 2053.	FGJHIK
TM 28	27	30	***** 2038.	FGJHIK
PI 266844	10	27	ABCD 2022.	FGJHIK
PI 538723	23	33	***** 2008.	FGJHIK
PI 355516	15	30	***** 2003.	EFGJHIK
PI 355548	19	36	***** 1988.	EFGJHIK
PI 190947	8	34	***** 1935.	EFGJHI
PI 190945	7	31	***** 1876.	EFG HI
PI 94740	3	32	***** 1850.	EFG HI
PI 290511	13	32	***** 1770.	EFGDH
PI 355526	16	31	***** 1740.	EFGD
PI 272561	12	25	AB 1727.	EFGD
Newana	32	27	ABC 1683.	EF D
CI 13963	1	29	ABCDEFG 1683.	EF D
CI 7686	25	44	***** 1634.	E CD
TM 639	29	32	***** 1442.	BCD
PI 378469	24	35	***** 1276.	ABC
PI 182461	5	25	A 1073.	AB
PI 182462	6	28	ABCDEF 1050.	A
OVERALL MEAN =			1993.	
F-RATIO TRTS =			12.48	
CV (S/MEAN) % =			11.41	
LSD(0.05 by t)=			370.9	

Multiple comparisons are 0.05 LSD.