PROJECT TITLE: 2005 comparing the post harvest dormancy of Haxby and Eslick barley to Harrington and other lines.

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OBJECTIVES:
Determine if Haxby and Eslick barley have a tendency toward slower post harvest germination than does Harrington barley.

RESULTS:
The mean germination after 72 and 96 hrs suggest there are differences between seed source locations for germination speed (Tables 1-3). Similar results have been observed in previous years (data not presented). However, the differences between locations may in part be due to placement of the seed flats within the germination chamber. The Denton location was in the bottom of the germination chamber where it was cooler, as determined by touch, than temperature at the top chamber where the Moccasin seed was placed.

Statistical analysis across location reviewed three general groups of germination speed, within the seven entries, after 72 hrs in the germination chamber. Harrington was the quickest germinator with an average 72 hrs germination of 74.8% (see table 4). Haxby, Metcalfe, and MT960101 had intermediate level of 72 hrs germination at 52.9 to 46.2%. The entries MT910189, Eslick, and MT970116 were in the slowest germinating class after 72 hrs with germination means between 37.1% to 32.7%. The varieties exhibited a similar speed of germination after 96 hrs (See Table 5). Table 6 shows the mean percent of seeds that germinated between 96 and 120 hrs. Eslick and MT970116 had the most seed germinating in the 96 to 120 hr period indicating they were slower to germinate that the other entries. Total germination is presented in Table 7.

It was noted that the Metcalfe primary roots were slower emerging and appeared to be shorter than the other entries.

SUMMARY:
Harrington is used as a standard for quick barley. Harrington along with other quick germinating (low post harvest dormancy) Lewis, Chinook, Bear Paw , and others are considered highly suited for continuous crop dryland cropping systems because of low post harvest seed dormancy. The low level of post harvest dormancy allows the seed to sprout readily with late summer and fall precipitation which facilitates winter mortality of the barley seedling. Seed of more dormant lines are more apt to pass through the fall without germinating and have a greater potential to produce volunteer plants in winter wheat or early seeded spring crops.

Metcalfe and Haxby were slightly slower germinating than Harrington in 2005 which was similar to observations made in 2004. this suggest that these two lines will be consistently a little slower germinating than Harrington. Eslick was on of the slowest germinating entries for the second year in a row. Eslick may not be as slow as the notorious varieties Stark and Steptoe, but it should be grown initially with some caution in a cereal only dryland cropping system where wheat is the primary crop. Eslick recommended as an irrigated variety as Haxby generally produces more grain on dryland.

FUTURE PLANS:
Continue to evaluate cereal varieties for post harvest dormancy. Species other than barley, wheat and triticale, may be evaluated in the future.

Table 1 Germination speed of 2005 barley produced under dryland recrop at **Moccasin**.
Exp21Grm Central Agricultural Research Center. Moccasin, Montana.

		Total Germinated Seed			
Variety	trt	72hrs	96hrs	120hrs	96hrs to 120hrs
	#	%	%	%	#
Haxby	1	62.3	88.8	100	11.2
Eslick	5	45.0	71.0	100	29.0
Harrington	7	85.4	100.0	100	0.0
Metcalfe	12	83.9	97.0	100	3.1
MT910189	13	58.3	87.0	98.9	12.0
MT960101	14	55.0	84.3	100	15.8
MT970116	15	50.0	75.0	100	25.1
	Mean	62.8	86.1	99.8	13.7
	CV (S/M) %	16.78	10.36	0.5889	62.9
	LSD(0.05)	25.8	21.8	1.4	21.1

Table 2 Germination speed of 2005 barley produced under dryland recrop at **Denton**.

		Total Germinated Seed			
Variety	trt	72hrs	96hrs	120hrs	96hrs to 120hrs
	#	%	%	%	#
Haxby	1	50.4	92.7	99.0	6.3
Eslick	5	40.5	64.9	100.0	35.2
Harrington	7	75.0	98.0	100.0	2.0
Metcalfe	12	17.4	59.3	100.0	40.7
MT910189	13	16.3	26.5	71.5	44.9
MT960101	14	40.6	63.6	100.0	36.5
MT970116	15	17.0	27.0	100.0	73.0
	Mean	36.73	61.7	95.78	34.08
	CV (S/M) %	24	19.32	6.951	31.03
	LSD(0.05)	21.57	29.17	16.29	25.88

Table 3 Germination speed of 2005 barley produced under **drylandfallow at Winifred**.

		Total Germinated Seed			
Variety	trt	72hrs	96hrs	120hrs	96hrs to 120hrs
	#	%	%	%	#
Haxby	1	30.0	62.9	89.6	26.8
Eslick	5	14.3	40.9	99.0	58.2
Harrington	7	64.0	89.0	90.0	1.0
Metcalfe	12	38.0	90.0	100.0	10.0
MT910189	13	36.8	66.3	100.0	33.7
MT960101	14	63.3	93.9	100.0	6.1
MT970116	15	31.3	56.3	89.6	33.4
	Mean	39.6	71.3	95.5	24.2
	CV (S/M) %	39.0	13.7	8.0	28.4
	LSD(0.05)	37.8	23.9	18.6	16.8

Germinations done late November 2005 at 50^{o} F

Table 4 Barley seed germination after 72 hrs at 50 F. Seed sources were 2005 Barley variety trials at Moccasin, Denton and Winifred. Central Agricultural Research Center. Moccasin, Montana.

Variety	Entry	Reps	72hrs	location	reps	72 hrs
	#	#	%		#	%
Haxby	1	6	47.52 bc	Moccasin	14	62.81 b
Eslick	5	6	33.23 a	Denton	14	36.73 a
Harrington	7	6	74.80 d	Winifred	14	39.64 a
Metcalf	12	6	46.42 abc			
MT910189	13	6	37.12 ab			
MT960101	14	6	52.95 c			
MT970116	15	6	32.73 a			
MEAN (N = 42) =			46.40			46.40
SE FOR MEAN =			4.698			3.075
SE FOR DIF =			6.643			4.349
LSD (cal by t) =			13.82			9.044
DIF 0.9 POWER =			22.66			14.83
SIGNIF LEVEL =			.0500			.0500

SOURCE	DF	S.S.	M.S.	F-VALUE	P-VALUE
ENTRY	6	7782.2	1297.0	9.79	.0000
LOCATION	2	5720.7	2860.4	21.60	.0000
ENT*LOC	12	4918.6	409.89	3.09	.0114
RESIDUAL	21	2781.4	132.45		

Table 5 Barley seed germination after 96 hrs at 50 F. Seed sources were 2005 Barley variety trials at Moccasin, Denton and Winifred. Central Agricultural Research Center. Moccasin, Montana.

Variety	Entry	Reps	96hrs	location	reps	96 hrs
	#	#		# #	%	
Haxby	1	6	81.45 b	Moccasin	14	86.13 c
Eslick	5	6	58.90 a	Denton	14	61.70 a
Harrington	7	6	95.67 c	Winifred	14	71.31 b
Metcalf	12	6	82.08 b			
MT910189	13	6	59.92 a			
MT960101	14	6	80.57 b			
MT970116	15	6	52.75 a			
MEAN (N = 42) =			73.05			73.05
SE FOR MEAN =			4.422			2.895
SE FOR DIF =			6.253			4.094
LSD (cal by t) =			13.00			8.513
DIF 0.9 POWER =			21.3			13.96

SOURCE	DF	S.S.	M.S.	F-VALUE	P-VALUE
ENTRY	6	9029.8	1505.0	12.83	.0000
LOCATION	2	4240.4	2120.2	18.08	.0000
ENT*LOC	12	6646.1	553.84	4.72	.0010
RESIDUAL	21	2462.9	117.28		

Table 6 Barley seed germination between 96 and120 hrs at 50 F. Seed sources were 2005 Barley variety trials at Moccasin, Denton, and Winifred. Central Agricultural Research Center. Moccasin, Montana.

Variety	Entry	Reps	96 to 120hrs	location	reps	96 to 120 hrs
	#	#	%		#	%
Haxby	1	6	14.75 b	Moccasin	14	13.71
Eslick	5	6	40.77 d	Denton	14	34.08
Harrington	7	6	1.000 a	Winifred	14	24.15
Metcalf	12	6	17.92 b			
MT910189	13	6	30.18 c			
MT960101	14	6	19.45 b			
MT970116	15	6	43.80 d			
MEAN (N = 42) =			23.98			23.98
SE FOR MEAN =			3.595			2.353
SE FOR DIF =			5.084			3.328
LSD (cal by t) =			10.57			6.922
DIF 0.9 POWER =			17.34			11.35

SOURCE	DF	S.S.	M.S.	F-VALUE	P-VALUE
ENTRY	6	8302.0	1383.7	17.84	.0000
LOCATION	2	2903.5	1451.8	18.72	.0000
ENT*LOC	12	4821.2	401.77	5.18	.0005
RESIDUAL	21	1628.4	77.545		

Table 7 Barley seed germination after 120 hrs at 50 F. Seed sources were 2005 Barley variety trials at Moccasin, Denton and Winifred. Central Agricultural Research Center. Moccasin, Montana.

Variety	Entry	Reps	120 hrs	location	reps	120 hrs
	#	#	%		#	%
Haxby	1	6	96.20 ab	Moccasin	14	99.84 a
Eslick	5	6	99.67 b	Denton	14	95.78 a
Harrington	7	6	96.67 ab	Winifred	14	95.46 a
Metcalf	12	6	100.0 b			
MT910189	13	6	90.12 a			
MT960101	14	6	100.0 b			
MT970116	15	6	96.53 ab			
MEAN (N = 42) =			97.03			97.03
SE FOR MEAN =			2.730			1.787
SE FOR DIF =			3.861			2.528
LSD (cal by t) =			8.029			5.256
DIF 0.9 POWER =			13.17			8.620

SOURCE	DF	S.S.	M.S.	F-VALUE	P-VALUE
ENTRY	6	440.7	73.4	1.64	.1850
LOCATION	2	167.3	83.6	1.87	.1788
ENT*LOC	12	1289.8	107.5	2.40	.0379
RESIDUAL	21	939.19	44.72		