

2008 PACIFIC NORTHWEST MUSTARD VARIETY TRIAL RESULTS

Jim B. Davis¹, Mary Lauver¹, Jack Brown¹, and Don Wysocki²

¹PSES Dept., University of Idaho, Moscow, ID 83844-2339

²Columbia Basin Agricultural Research Center, Oregon State University, Pendleton, OR

ABSTRACT

A mustard variety trial with 18 cultivars or advanced breeding lines was grown at 11 locations in Oregon, Washington, and Idaho. Mean yields of the mustard cultivars and breeding lines ranged from 1210 to 1561 lbs. per acre when averaged across all locations. Mean yields for individual location yields ranged from 826 at Pendleton, Oregon to 2657 lbs. per acre at Moscow, Idaho. The overall mean was 1402 lbs. per acre. A University of Idaho breeding line, '98.CY.50.1', was the highest yielding yellow mustard cultivar with a mean yield across all sites of 1561 lbs. per acre, which was over 100 lbs. per acre above the next highest yielding yellow mustard cultivar.

INTRODUCTION

During the past fifteen years, canola acreage in the Pacific Northwest (PNW) has increased dramatically, and the PNW has become a center of canola production in the U.S.A. In preliminary trials during the early 1990s, yellow mustard (*Sinapis alba*) and oriental mustard (*Brassica juncea*) were found to be better adapted than spring canola to those areas in the PNW with high summer temperatures and low rainfall. In 1992, the University of Idaho started yellow mustard and oriental mustard breeding programs and has since released two cultivars, 'IdaGold' and 'Pacific Gold,' that are suitable for production in the PNW. The University of Idaho has also worked with a third market class of mustard, brown mustard (*B. juncea*), and a new cultivar in this class, 'Kodiak,' is currently being evaluated and increased. Unlike the situation with spring canola where several commercial companies are developing and testing new cultivars, the University of Idaho has the only mustard breeding program in the U.S.A. The success of these breeding efforts is determined in part by having good yield trials to test the adaptability of potential cultivars and parents. The Pacific Northwest Mustard Variety Trial (PNWMVT) was established in 1999 to evaluate existing cultivars as well as new breeding lines in the wide range of environments found in the inland PNW.

From 2003 to 2006, the Idaho Canola and Rapeseed Commission provided funding to support multiple location yield trials for advanced mustard breeding lines. The trial was continued in 2007 without external funding. In 2008, the Idaho Oilseed Commission provided partial funding for the trial so that it could be continued. Over the past five years we have evaluated 33 different yellow mustard cultivars/advanced breeding lines, 20 different Oriental cultivars or breeding lines, and three different Dijon/brown mustard types in trials throughout Idaho and the Pacific Northwest. Approximately half of the eight to fifteen locations each year were grown in a direct seed system.

MATERIALS AND METHODS

Eleven yellow mustard (*S. alba*) cultivars or advanced breeding lines, five oriental mustard (*B. juncea*) cultivars, and two brown mustard cultivars (*B. juncea*) were tested at 11 locations in the Inland Pacific Northwest. ‘IdaGold’ yellow mustard was developed at the University of Idaho and is commercially available in the region. ‘AC Pennant’ and ‘Tilney’ yellow mustards have been grown commercially in the PNW, and seed of these cultivars is available during some, but not all years. The yellow mustard cultivars ‘Viscount’ and ‘AC Base’ are reported to have good processing quality, but they have not been widely available in the PNW. ‘Andante’ and ‘Ace’ are relatively new cultivars from Canada. ‘Pacific Gold’ oriental mustard was developed at the University of Idaho and is also commercially available. ‘Cutlass’ is a Canadian oriental mustard cultivar that has been grown widely in the northern Great Plains of the U.S.A. and Canada. ‘Kodiak’ brown mustard is another University of Idaho cultivar, and limited seed may be available in the spring of 2009. ‘Duchess’ is also a brown mustard, but it has not been grown in the PNW. All other numbered lines are selections from the University of Idaho breeding program.

The 2008 trials were planted at eleven locations: Bonners Ferry, ID; Moscow, ID; Genesee, ID; Lewiston, ID; Craigmont, ID; Dayton, WA; Colfax, WA; Fairfield, WA; Davenport, WA; Moro, OR; and Pendleton, OR. Planting dates and tillage regimes for the harvested sites are shown in of Table 1.

Table 1. Location, location code, tillage regime, and planting date of trials in the 2008 Pacific Northwest Mustard Variety Trial.

Location	Location Code	Tillage Regime	Planting Date
Bonners Ferry, ID	BONN	tilled	May 1
Moscow, ID	MOSC	tilled	April 28
Genesee, ID	GENE	tilled	May 6
Lewiston, ID	LEWI	tilled	April 3
Craigmont, ID	CRAG	direct seed	April 26
Davenport, WA	DAVE	direct seed	April 25
Fairfield, WA	FAIR	direct seed	May 8
Colfax, WA	COLF	direct seed	April 9
Dayton, WA	DAYT	direct seed	April 24
Pendleton, OR	PEND	tilled	March 12
Moro, OR	MORO	tilled	March 18

At each location, the trial design was a randomized, complete block with four replications. The seeding rates were 8 lbs. of seed per acre for yellow mustard cultivars and 5 lbs. per acre for oriental and brown mustard cultivars. Plot size was 4 feet by 16 feet. All trials were grown on recrop ground after a cereal crop and were fertilized according to local practice. The date of flower onset and plant height at maturity was recorded at the Genesee site. Lodging is usually scored at one or two sites each year where it is a problem, but little lodging was observed this year, so no notes were taken. After harvest, the seed was weighed to determine yield.

RESULTS AND DISCUSSION

The dates of flowering of the yellow mustard cultivars ranged from 48 to 50 days (Table 2), and the dates for oriental and brown cultivars ranged from 50 to 53 days. The small amount of variation seen for flowering date within each mustard species has been typical of material. Mean plant height of yellow mustards ranged from 42 to 50 inches, and mean plant height of oriental and brown mustards ranged from 50 to 56 inches. Andante, AC Base, and Tilney were the shortest cultivars, and Kodiak was the tallest cultivar.

The mean yields from the different locations varied widely, reflecting the diverse environments found in the PNW. The Moscow site had the highest yield, 2657 lbs. per acre (Table 2), and the Pendleton site had the lowest yield, 826 lbs. per acre. Seed yields of the individual cultivars averaged across the eleven locations varied from 1210 to 1561 lbs. per acre, with the overall mean of the cultivars being 1402 lbs. per acre.

All cultivars and most breeding lines showed acceptable performance. Top performing yellow mustards from previous years, IdaGold, AC Pennant, Viscount, and Tilney remained in a pack with yields in the range of 1300 to 1400 lbs. per acre as in previous years. Andante also had yields similar to this group of cultivars. University of Idaho breeding line '98.CY.50.1' and Ace had the highest yields among the yellow mustards, just as in 2007. Pacific Gold remained among the highest yielding oriental mustards, with its yield of 1518 lbs. per acre similar to that of two University of Idaho breeding lines.

When averaged over all sites, Pacific Gold oriental mustard yielded higher than the commercial yellow mustard cultivars. However, readers should pay close attention to the difference in performance of the two mustard species at each location when examining the yield data. In some locations the performance of the two species was similar; however, that is not always the case. Typically, yellow mustards (*S. alba*) perform better in hotter, drier regions, and oriental and brown mustards (*B. juncea*) perform better in cooler, wetter regions. To complicate the situation, the relative performance of the two species will reverse from year to year at some locations, depending on the weather. In addition to these yield considerations, growers should also consider marketing, contract availability, and pricing when choosing a type of mustard to produce.

Table 2. Results of the 2008 PNWMVT including mean yield across sites (lbs./acre), yield rank, yield by location (lbs./acre.), flower start (days after planting), and plant height (inches).

Variety	Mean Yield	Rank	BONN	MOSC	GENE	LEWI	CRAG	DAVE	FAIR	COLF	DAYT	PEND	MORO	Flower Start	Plant Height
Yellow Mustard															
IdaGold	1409	5	1484	2442	1847	739	952	1758	1325	1863	1351	954	789	48	45
Ace	1425	2	1558	2653	2155	684	869	1379	1335	1769	1390	980	902	48	47
Andante	1334	8	1466	2223	2049	889	877	1623	1243	1500	1115	936	758	49	42
AC.Base	1346	7	1559	2132	2340	792	918	1861	1253	1152	1162	787	855	48	42
AC.Pennant	1316	9	1462	2414	2090	865	925	1482	1141	1236	1201	803	863	49	44
Tilney	1308	10	1358	2102	2132	806	939	1634	1115	1418	1146	934	799	48	42
Viscount	1413	4	1490	2549	2208	713	1024	1657	1258	1820	1343	713	767	49	48
Braco	1210	11	1501	2185	1679	401	798	1755	1188	1325	936	804	743	50	46
98.CY.50.1	1561	1	1836	2696	2072	1064	1150	1934	1464	1765	1500	765	921	48	47
98.CY.54.7A	1419	3	1457	2696	2263	724	1030	1669	1267	1485	1387	806	828	50	50
UI.3277.74	1381	6	1642	2736	1912	685	854	1490	1377	1468	1338	895	795	48	45
Mean	1375		1528	2439	2068	760	940	1658	1270	1527	1261	852	820	49	45
Oriental and Brown Mustard															
Pacific Gold	1518	2	1660	3056	2204	747	1262	2336	1589	811	1347	867	814	51	52
Cutlass	1352	6	1268	2852	1989	644	1019	2088	1341	789	1158	883	840	51	52
BJ.OZ.6	1305	7	981	2972	1868	658	1100	2262	1241	519	1191	783	779	52	53
BJ.OZ.24	1558	1	1432	3176	2106	730	1518	2656	1521	971	1401	742	884	50	52
BJ.OZ.36	1483	3	1218	3005	2043	697	1341	2739	1459	1051	1212	728	820	52	53
Kodiak	1425	5	1372	3109	1923	910	758	2929	1451	822	1034	639	734	53	56
Duchess	1470	4	1241	2822	1834	978	1089	2508	1676	847	1286	850	1035	52	50
Mean	1444		1310	2999	1995	766	1155	2503	1468	830	1233	785	844	52	53
Overall Mean	1402		1444	2657	2040	763	1024	1987	1347	1274	1250	826	829	49.7	50.5
LSD p=0.05	97		225	419	457	285	262	522	261	360	255	240	250	1.1	4.2
CV			11	11	16	26	18	18	14	20	14	20	21	1.6	8.8