



**John Sherwood – Department Head of Plant Sciences
and Plant Pathology**

119 Ag Bioscience Building
P.O. Box 173150
Montana State University
Bozeman, MT 59717-3150

Phone: (406) 994-
5153

Fax: (406) 994-7600

sherwood@montana.ed
u

<http://plantsciences.montana.edu/>

Plant Pathology

Plant Genetics
Plant Biology
Crop Science
Horticulture

DATE: January 24, 2007

TO: Variety Release and Recommendation Committee Members

FROM: John Sherwood, Chairman

Re: 2007 Minutes and Committees

Chairman: John Sherwood, Department Head PSPP

Secretary: Irene Decker, Administrative Assistant, PSPP

Present: John Sherwood, Roger Hybner, David Wichman, Jerry Bergman, Ray Ditterline, Dan Biggerstaff, Becky Mahurin, Joyce Eckhoff, Susan Lanning, Bob Stougaard, Greg Kushnak, Jim Berg, Nancy Blake, Wendell Morrill, Luther Talbert, Peggy Lamb, Gregg Carlson, Bear Whitmer, Ron Larson, Phil Bruckner, Ken Kephart, Bill Grey, Dan Lake, Gigi Opena, Joy Garcia, Deb Harrison, Fabian Menalled, Mary Burrows, Sue Blodgett, John Miller, Bernie Schaff, Dennis Cash, Melvin Goffena, Joe Scianna, Shannon Majerus, Mike Giroux, Larry Holzworth, Tracy Dougher, Stan Bates, Bill Hoch, Perry Miller and Irene Decker

Agenda:

1. Approval of 2005 Minutes Variety Release and Recommendation Committee(s)
2. Discuss and vote on the motions put forth by the following committees in the order given:
Wheat, Forage, Specialty, and Horticulture and Native Plants

Wheat:

Luther Talbert - Vida - hard red spring wheat
Phil Bruckner – Yellowstone – hard red winter wheat
Phil Bruckner – Wahoo – hard red winter wheat
Phil Bruckner – Big Sky and Tiber – hard red winter wheats
Phil Bruckner – Hyalite – hard white winter wheat
Craig Cook – Corbin – hard red spring wheat

Forage:

Dennis Cash – UWRD sainfoin

Specialty:

Jerry Bergman – 95B7446 – safflower
Jerry Bergman – 95B3538 - safflower
Duane Johnson – MT 0301 - camelina
Duane Johnson - Mt 0303 - camelina
Duane Johnson - MT 0305 – camelina

Horticulture and Native Plants

Joe Scianna – Opportunity germplasm big bluegrass

Wheat Variety Release Committee		
Voting Members, 16	Affiliation	Appointing Administrator
<i>Chair , John Sherwood</i>	<i>PSPP Head</i>	<i>Director MAES</i>
1. Phil Bruckner-spring Luther Talbert-winter	Breeder	PSPP Head
2. Mike Giroux	Quality - Cereal or Forage	PSPP Head
3. Mary Burrows	Plant Pathologist	PSPP Head
4. Bill Grey	Manager	MT Foundation Seed Program
5. Ron Larson	Manager	MT Seed Growers Association
6. Fabian Menalled	Weed Scientist	LRES Head
7. <i>Perry Miller - absent</i>	Cropping systems	LRES Head
8. Wendell Morrill	Entomologist	LRES Head
9. Gregg Carlson		NARC Superintendent
10. Dave Wichman		CARC Superintendent
11. Greg Kushnak		WTARC Superintendent
12. Bob Stougaard		NWARC Superintendent
13. Joyce Eckhoff		EARC Superintendent
14. Ken Kephart		SARC Superintendent
15. Dan Lake	Chair	MAES Advisory Board
16. Mel Goffena		Montana Wheat and Barley Comm.
Ex-officio Becky Mahurin	Dir. Technology Transfer	V.P. for Research, Creativity and Technology Transfer

John Sherwood has requested a proposed name, in addition to the identification number, be included in the motions put forth for the variety release committees. In addition, he requested that a tentative date be given for when the seed will be available.

Motion by Luther Talbert that “Vida” spring wheat be recommended for dryland production in Districts 1, 2, 3, 4, 5 & 6.

Second – Joyce Eckhoff

Vida was a F4 derived line first entered in the 2001 single row yield trial at Bozeman, and designated as “MT 0245” when entered in the 2002 preliminary spring wheat nursery grown at four dryland locations in Montana. From 2003- 2006 it has been tested for 40 station years in the advanced spring wheat nursery grown across Montana. Vida was approved for release in 2006 to go in effect 2007 Vida has been one of the highest yielding wheats grown in our advanced spring wheat nursery since 2003. Across 40 location years, Vida yielded 64.5 bu/ac, 2 and 6 bushels more than Reeder and McNeal, respectively. Vida yielded an average of 54 bu/ac under dryland at Havre, Sidney, Conrad and Moccasin compared to McNeal at 47 bu/ac and Reeder at 50 bu/ac. Under irrigation, at Sidney, Huntley and Bozeman, Vida yielded 87 bu/ac with McNeal yielding 82 bu/ac and Reeder 83 bu/ac. Overall test weights were 59, 58.4 and 60 for Vida, McNeal and Reeder respectively. Across locations, Vida heads about the same as McNeal and one day later than Reeder. Vida is a semidwarf wheat, about 33 inches tall, which is the same as McNeal and one inch shorter than Reeder. Grain protein of Vida averages 14.5% while McNeal and Reeder average 14.7 and

14.9, respectively. Vida has medium straw strength and tends to lodge slightly under irrigated conditions. Vida has intermediate stem solidness with moderate tolerance to the wheat stem sawfly. Vida has moderate resistance to stripe rust and septoria, but moderate susceptibility to prevalent races of stem rust. Vida exhibits acceptable milling and baking quality traits. There were approximately 800 bushels of Foundation seed harvested in 2006.

Discussion: Vida has medium straw strength and tends to lodge slightly under irrigated conditions. Vida has intermediate stem solidness with moderate tolerance to the wheat stem sawfly. Vida has moderate resistance to stripe rust and septoria, but moderate susceptibility to prevalent races of stem rust. Vida exhibits acceptable milling and baking quality traits. It has extremely good grain yield with grain protein being moderate to low. The protein level in Eastern Montana was not good. Joyce Eckhoff stated that they grew 20 varieties in five locations and Vida had a protein level in the top third. Gregg Carlson stated that low protein is related to high yield; therefore the addition of adequate nitrogen for the yield potential will raise the protein. There were approximately 600-800 bushels of Foundation seed available for allocation by MFSP in spring 2007.

Motion repeated.

Vote: 16 for, 0 against

Motion by Luther Talbert that Corbin be recommended as a hard red spring wheat for dryland production on dryland sawfly areas in Districts 4 & 5.

Second – Dave Wichman

Corbin is a hard red spring wheat selected from the progeny of the cross Border x Conan.

Application for PVP

*will be submitted and the Title V option will **not** be selected. Corbin is being released to replace and/or compliment the variety Conan. For the five year period 2001 - 2004, & 2006 (not entered in 2005)*

(49 locations), the average per acre yield of Corbin in the MSU Intrastate Trials is 58.8 bushels, compared to Conan at 57.6 bushels. The average test weight has been .4 pounds higher than Conan, with similar protein levels to Conan. The average plant height of Corbin is 30.6 inches which is 1.3 inched taller than Conan. The average heading date of Corbin is one day earlier than Conan. Milling and baking quality data from the 2003-2004 crop indicate that flour extraction is higher than the check variety Conan. Water absorption, mixing time, loaf volume and crumb grain score for Corbin are comparable to the check varieties (Table 8 and 9.). Disease/sawfly ratings for Corbin show it to be moderately resistant to stripe rust (Table 11. 2006 Kalispell nursery) and similar to Conan for sawfly tolerance (Table 10. 2006 Havre nursery).

Dan Biggerstaff filled in for Dale Clark

Discussion: Dan B. led the discussion in place of Dale Clark. Corbin is meant to replace or complement Conan. The quality of Corbin is better than Conan and has better than average sawfly tolerance. Mary B. asked about its susceptibility to scab and Dan B. said that Corbin is definitely not recommended under severe scab disease.

John S. asked about stem solidness data and Dan B. said it is hollow to average in stem solidness. It does have good sawfly resistance similar to Conan but that is not due to stem solidness.

Greg C. asked about hollowness and Dan B. stated that it is better than Conan. In addition, that sawfly are not attracted to it because they cannot smell it. Greg C. stated that Reeder is a sawfly magnet; Corbin is obviously in a better group.

Motion repeated.

Vote: 16 for, 0 against

Motion by Phil Bruckner that Yellowstone hard red winter wheat be recommended for production in Districts 1,2,3,4,&5.

Second – Dave Wichman

Yellowstone is a very high-yielding, winter hardy HRW wheat line with medium test weight, maturity, height, and grain protein (Table 1). Yellowstone has excellent baking quality (Table 2). The line is moderately resistant to stripe rust and susceptible to stem rust.

Discussion: Phil B. stated that Yellowstone was approved in 2005. It was the highest yielding group in all districts. It had intermediate test weight, average protein, very good quality, fairly long baking mix time, high water absorption. Disease resistance has moderate resistance to stripe rust in a Pullman, WA nursery and highly resistant at Bozeman and Kalispell, MT. There is speculation that the additional resistance beyond that of Promontory may be coming from the other parent, Judith. It is susceptible to stem rust which is the reason for excluding District 6 from the recommendation. Yellowstone is a hollow variety and should not be used where sawfly is a pest problem.

Motion repeated.

Vote: 16 for, 0 against

Motion by Phil Bruckner that Wahoo hard red winter wheat be recommended for production in Districts 3 & 4.

Second – Dave Wichman

Wahoo is a high-yielding, winter hardy HRW wheat line with medium test weight, early maturity, semidwarf height, and medium grain protein (Table 1). The heading date of Wahoo is 4 to 5 days earlier than cultivars, Yellowstone and Pryor, which could provide a production advantage in certain environments prone to terminal drought and heat stress.

Discussion: Nebraska tested Wahoo for five years. Nebraska lines in general head 4-5 days earlier than Montana lines. Wahoo would be a good variety for the Yellowstone valley where summer heat can impact late developing winter wheat cultivars. It is a good yielder, intermediate test weight, pretty good winter hardiness, pretty good resistance in the field and stem rust resistance. In Montana, it is susceptible to stripe rust. The end use quality is toward the lower end of variety set shown, which is similar to some lines such as Pryor. It has adequate quality for Montana. This motion is only for Districts 3 and 4. It could be recommended for other districts, but it is not better than what is already there.

Wendell M. stated that it is the only one that show resistance to Hessian Fly. Should it be recommended for more districts?

Phil B stated that there is no data on the reaction of Wahoo to the Hessian fly in Montana..

Wendell M. stated that it should be tested for several years in several locations to test for Hessian fly resistance.

Phil B asked the District 5 representatives if the motion should include District 5.

Greg C. said it should not because of lack of winter hardiness.

Greg K. agreed.

Phil B. stated that if someone wants to grow Wahoo, they need to work with the Nebraska seed grower association to obtain foundation seed.

Motion repeated

Vote: 16 for, 0 against

Motion by Phil Bruckner that BigSky and Tiber be removed from the list of varieties recommended in

Districts 2, 3, & 4.

Second: Joyce Eckhoff

BigSky is currently recommended for production in districts 3, 4, and 5. Tiber is recommended for production in districts 2, 4, and 5. This motion would remove the recommendation for BigSky in districts 3 and 4 and the recommendation for Tiber in districts 2 and 4. The justification for removal from the recommended list is poor yield performance (Tables 1, 3-10) and stripe rust susceptibility (Table 2).

These lines have not performed at highest levels in these districts and both are susceptible to stripe rust.

John S. reminded the committee that it is still recommended for District 5. Should it stay on the District 5 recommended list?

Friendly motion by Gregg Carlson to amend the original motion to also remove Tiber and BigSky from the recommended list in District 5. Accepted as such by Phil Bruckner.

Second: Dave Wichman.

Vote: 16 for, 0 against

Motion by Phil Bruckner that Hyalite hard white winter wheat be recommended for production in Districts 2,3,4,& 5.

Second: Greg Kushnak

Hyalite is a high-yielding, medium maturity, conventional-height hard white CLEARFIELD® winter wheat cultivar developed and released by MAES in 2005 and exclusively licensed to Westbred LLC. On the basis of limited field observations under natural infection in Montana, Hyalite is resistant to stem rust and very susceptible to stripe rust (Table 1). Based on seven Montana crop tolerance trials, tolerance of Hyalite to imazamox is equivalent to that of Above and MT1159CL.

Based on composite grain samples from 2003 and 2004 (n=9), milling and bread baking characteristics of Hyalite (data not shown) are similar to those of Neeley with exception that Brabender Automat flour extraction of Hyalite (674 g kg⁻¹) was significantly higher (P<0.05) than that of Neeley (659 g kg⁻¹) and flour ash of Hyalite (3.6 g kg⁻¹) was lower than that of Neeley (3.8 g kg⁻¹). Hyalite and Neeley were similar for mixograph tolerance (4.6 and 5.0, respectively), bake water absorption (717 and 711 g kg⁻¹, respectively), bake mixing time (6.5 and 7.4 min, respectively) and loaf volume (1051 and 1055 cc, respectively). Like parental lines NuWest and NuSky, Hyalite has a moderately low level of polyphenol oxidase (PPO) and has good Chinese noodle brightness and noodle color stability. In 2005 quality evaluation (n=4), Hyalite was statistically equivalent (P>0.05) to NuWest and NuSky hard white wheat for single kernel characterization system (SKCS) hardness index (79.7), Brabender Automat flour extraction (696 g kg⁻¹), flour ash content (3.7 g kg⁻¹), mixograph tolerance (3.8), bake water absorption (711 g kg⁻¹), bake mixing time (6.2 min), loaf volume (991 cc), Chinese raw noodle brightness at 0 hr (L=86.6) and 24 hr (L*=78.9), and noodle color stability (L*0 hr-L*24 hr=7.7).*

Discussion: In 2005, there were three Clearfield lines approved, Bynum, Norris and Hyalite. Westbred moved ahead quicker with Bynum and Norris and Hyalite lagged behind in seed production. Hyalite is the only hard white winter wheat with the Clearfield trait available in Montana. It has performed well in the field, it is very susceptible to stripe rust and has adequate stem rust resistance. Milling and baking quality are comparable to NuWest and Nusky and Neeley. Hard whites are used for noodles – this one is similar to the above two for those characteristics.

Dan B. stated that General Mills considers Hyalite an acceptable wheat. Growers must have training in the Clearfield system.

John S. asked about availability.

Dan B. said that it is available, but stressed that a grower must have a market strategy for the grain in place before growing it.

Bill Grey asked about stripe rust in the seed production fields and Dan B. stated that in 2006 the disease was pretty significant but manageable.

Motion repeated.

Vote: 16 for, 0 against.

Forage Crop Variety Release Committee		
<i>Voting Members, 16</i>	<i>Affiliation</i>	<i>Appointing Administrator</i>
<i>Chair, John Sherwood</i>	<i>PSPP Head</i>	<i>Director MAES</i>
1. Ray Ditterline	Breeder	PSPP Head
2. Dennis Cash	Quality - Cereal or Forage	PSPP Head
3. Mary Burrows	Plant Pathologist	PSPP Head
4. Bill Grey	Manager	MT Foundation Seed Program
5. Ron Larson	Manager	MT Seed Growers Association
6. Fabian Menalled	Weed Scientist	LRES Head
7. <i>Perry Miller - absent</i>	Cropping systems	LRES Head
8. Wendell Morrill	Entomologist	LRES Head
9. Gregg Carlson		NARC Superintendent
10. Dave Wichman		CARC Superintendent
11. Greg Kushnak		WTARC Superintendent
12. Duane Johnson		NWARC Superintendent
13. Joyce Eckhoff		EARC Superintendent
14. Ken Kephart		SARC Superintendent
15. Dan Lake	Chair	MAES Advisory Board
16. Roger Hybner		Bridger Plant Materials Ctr. Manager
Ex-officio Becky Mahurin	Dir. Technology Transfer	V.P. for Research, Creativity and Technology Transfer

Motion by Dennis Cash that that UWRD sainfoin be released jointly by the Montana Agricultural Experiment Station (MAES) and Wyoming AES as a public release variety (Option 2a).

Motion by Dennis Cash that UWRD sainfoin be named 'Delaney' sainfoin (pending approval by WAES).

Second: Ron Larson

Sainfoin (Onobrychis viciifolia Scop.) is a perennial forage legume widely adapted to the western U.S. and Canada¹. Sainfoin is unique among legumes used both for hay and direct grazing – its standing forage does not cause bloat. Intensive sainfoin breeding and research occurred during the 1960's until the 1980's. In Montana, 'Eski' was released in 1964, followed by 'Remont' in 1971. Other cultivars (Melrose, Nova) were released in Canada. In Montana production systems, the single-cut types such as Eski are competitive with yield and stand longevity of alfalfa, and the multiplecut cultivars (Remont) have better regrowth characteristics for high rainfall and short-term irrigated rotations. Despite some unique advantages of sainfoin, the crop was never widely grown. One primary reason for this has been its large seed size and resulting high initial planting costs.

Currently there is renewed interest in sainfoin in Montana and surrounding states. During recent evaluation trials for the release documentation of 'Shoshone' sainfoin we found that several new sainfoin lines were competitive with alfalfa under both irrigated and dryland conditions, and out-performed birdsfoot trefoil and cicer milkvetch. Shoshone appears to be an excellent single-cut cultivar to replace Eski sainfoin. Experimental UWRD similarly is poised to replace Remont as a multiple-cut cultivar.

Discussion: Dennis C. stated that this variety is better than Shoshone. Delaney should replace Remont eventually. There is no data to say that Delaney is resistant to nematodes.

Bill G. stated that Foundation seed of 'Delaney' sainfoin should be available to qualified seed growers in fall 2008 for the production of Certified class seed. There is no registered class seed allowed with 'Delaney' sainfoin." He also asked for a clarification on the acceptable seed classes for Shoshone and would request that they be the same as for Delaney.

Dennis C. stated that Mike Moore, Wyoming Seed Growers Assoc. and foundation seed manager has agreed that Shoshone and Delaney will have the same acceptable classes of seed.

Bill Grey has stated that Mike M. will provide to Montana Foundation Seed Program the breeders seed of Delaney. Wyoming Foundation Seed Program will produce and allocate Shoshone.

First Motion repeated.

Vote: 16 for, 0 against

Second motion repeated

Vote: 16 for, 0 against

Specialty Crop Variety Release Committee		
Voting Members, 16	Affiliation	Appointing Administrator
<i>Chair, John Sherwood</i>	<i>PSPP Head</i>	<i>Director MAES</i>
1. Ray Ditterline	Breeder	PSPP Head
2. <i>Norm Weeden - absent</i>	Breeder	PSPP Head
3. Mary Burrows	Plant Pathologist	PSPP Head
4. Bill Grey	Manager	MT Foundation Seed Program
5. Ron Larson	Manager	MT Seed Growers Association
6. Fabian Menalled	Weed Scientist	LRES Head
7. Perry Miller - present	Cropping systems	LRES Head
8. Wendell Morrill	Entomologist	LRES Head
9. Gregg Carlson		NARC Superintendent
10. Dave Wichman		CARC Superintendent
11. Greg Kushnak		WTARC Superintendent
12. Duane Johnson		NWARC Superintendent
13. Jerry Bergman		EARC Superintendent
14. Ken Kephart		SARC Superintendent
15. Dan Lake	Chair	MAES Advisory Board
16. Mal Westcott - <i>absent</i>		WARC Superintendent
Ex-officio Becky Mahurin	Dir. Technology Transfer	V.P. for Research, Creativity and Technology Transfer

Motion by Jerry Bergman to consider 95B7446 (to be named MonDak) for release as a protected licensed variety and for addition to the Montana Dryland and Irrigated Safflower Recommended List as a specialty high oleic safflower variety for the safflower oil and birdseed markets.

Second: Dave Wichman

95B7446 was derived from a single F₆ plant selection of a cross between the high linoleic Montana breeding line 89B1312 and safflower variety Montola 2000. Recurrent selection for high oleic fatty acid composition, Alternaria leaf spot resistance, high test weight and greater plant height was practiced in the breeding of 95B7446. Gas chromatography determinations for oil quality were made each generation to select for an oleic fatty acid (C18:1) oil composition of over 80%. 95B7446 is a high oleic safflower intended for use in the specialty birdseed markets. Its release will provide a specialty high oleic birdseed variety with normal white hull, improved Alternaria leaf spot resistance and higher test weight than Montola 2000.

95B7446 is considered a dual purpose variety for the birdseed market and for the high oleic safflower oil markets, because of its high oleic fatty acid content. 95B7446 has higher seed yielding ability, higher test weight, greater plant height and lower seed oil content than Montola 2000.

The flower color of 95B7446 is yellow in the bloom stage and orange in the wilt stage. 95B7446 plants are spiny with spines on the tip and along margins of the leaves and involucre bracts.

Jerry B stated that there are currently 8000 pounds of seed available and this would plant about 400 acres. The oleic acid fatty acid content is over 80%; this variety has greater plant height.

John S. stated that this is a protected license release and it would need to go before the license release committee.

Bill G. stated that the tables for 2005-2006 show a 6 on a scale of 1-9 for disease resistance to *Alternaria*— what would you like to see there?

Jerry B. stated that under irrigated conditions, a 6 or lower is good and acceptable for disease resistance.

Bill G. asked if there was a courtesy inspection of the breeder seed.

Jerry B. stated that it was grown at the Williston station and that North Dakota State Certification has inspected the field. There are approximately 4000 lbs of seed available.

Motion repeated.

Vote: 16 for, 0 against

Motion by Jerry Bergman that 95B3538 Safflower (to be named Cardinal) be considered for safflower variety release as a protected licensed variety by the Montana Agricultural Experiment Station and that 95B3538 Safflower (Cardinal) be considered for addition to the Montana Dryland and Irrigated Safflower Recommended List as a specialty high linoleic safflower variety for the safflower oil and birdseed markets.

Second: Dave Wichman

95B3538 was derived from a single F₄ plant selection in 1995 from a cross of a high linoleic safflower breeding line 89B2414 having Alternaria leaf spot resistance X safflower variety Finch. Recurrent selection for Alternaria leaf spot resistance was practiced in the breeding of 95B3538. 95B3538 was developed to provide a variety with improved disease resistance to Alternaria leaf spot and improved yielding ability when compared to Finch safflower. 95B3538 also shows improved resistance to Sclerotinia head rot and improved yielding ability compared to Finch when this disease occurs. 95B3538 will provide a high test weight, normal white hull safflower variety for the specialty birdseed market and a high linoleic safflower oil for the specialty high linoleic safflower oil markets.

The flower color of 95B3538 is yellow in the bloom stage and yellow in the wilt stage. 95B3538 plants are spiny with spines on the tip and along the margins of the leaves and involucre bracts.

Discussion: Jerry B. stated that one parent is Finch, which is the leading current birdseed safflower. Cardinal was developed to have improved yielding ability over Finch Safflower. It has improved resistance to Sclerotinia head rot, good test weight, improved Alternaria disease resistance, and a good source for linoleic oil. There is a market to make CLE and potential for feed for ruminant animals. There is a limited market for paints and varnishes. There are approximately 8000 lbs of seed available.

Bill G. asked if either of these safflowers were impacted by the charcoal rot that was observed this summer. Jerry B. stated they were not. He added that the breeder line in question was removed from consideration until confirmation of the pathogen responsible for the disease.

Gregg C. asked if there was a disease rating improvement over Finch and Jerry B. stated that there was an improvement over Finch.

Motion repeated.

Vote: 16 for, 0 against

Motion by Duane Johnson that camelina varieties MT 0301, MT 0303 and MT0305 be licensed releases under Option “c” of the “Variety Release Policy”. (Option c. License Release: Variety is protected with PVP title V and released as an exclusive [one business] or non-exclusive [more than one business] process. Each requires a license agreement with MSU Technology Transfer. Royalty Fees are collected with a license releases and MAES Research Fees are not collected.)

Camelina is an ancient crop first known to be cultivated in Northern Europe during the Bronze Age.

Camelina, Camelina sativa L., is native to northern Europe from Finland to Romania and Scandinavia. Camelina fell into disfavor when more productive crops such as wheat and canola began to be produced and camelina became a contaminant in flax. Farm subsidy programs supporting commodity crop further reduced camelina production. It became a common weed in Europe known as false flax (contaminating flax fields) and by its Roman name, Gold-of-Pleasure. Camelina cultivation has been strengthened recently as demand for omega 3 oils and biodiesel have increased. Omega 3s are a highly unsaturated fatty acid with the characterization of an unsaturation at position 3 on the fatty acid. Fatty acids are typically linked together, in either plants or animals, to form “triglycerides”- what we commonly call fats and oils. Both plants and animals manufacture triglycerides. Those at room temperature are solid are called fats, those that are liquid are oils.

Camelina has good agronomic characteristics. It is easily grown, is low in input requirements (water, nutrients, and pesticides) and return on investment by producers is good. Camelina is about 34-36% omega 3 oil.

The seeds are small (typically 345,000/lb) but very dense. The oils are high in omega 3 and also in gamma tocopherol (a superior vitamin E), which acts as an antioxidant. Therefore camelina oil is far more shelf stable than most vegetable-based omega 3 oils such as hemp, flax or perilla. The oils of these crops lack the ability to generate the highly valued, long-chain omega 3-type fatty acids: EPA and DHA. However, camelina offers higher level intermediates, which are more similar to EPA and DHA than other omega 3 vegetable oils and easily metabolized to EPA and DHA. Table 1, however, indicates camelina does contain EPA (20:5n3) and DHA (22:6n3) as intermediate standards were not available.

Camelina is a crop well suited to Montana’s varied growing conditions. Cold tolerance is excellent and camelina should be seeded before other spring-planted crops for maximum yield, typically early to mid-March. Typically, data show delays in planting after March 20 result in yield reductions averaging 100 pounds per week of delay. Fertility requirements are nominal with little response to Nitrogen, Phosphorus, Potassium or Sulfur in western Montana trials and similar responses to N, K and S in eastern Montana. Insects have not been a concern in the trials since they began in 2002. No diseases have been observed until 2006 and only under high rainfall conditions typical of the Flathead Valley. Currently, weed control can be accomplished with plant density and no herbicides are registered for use with camelina.

In terms of oil utilization, the oil is about 64% polyunsaturated, 30% monounsaturated, and 6% saturated fat. While this was detrimental to camelina development in the past, today’s technologies allow for a wide market potential of the oil and of its components for both food and industrial applications. A fatty acid profile of the cultivar ‘Celine’ is illustrated in Table 1. Omega 3 fatty acids are indicated by XX:Xn3. Fatty analysis of the US world collection at MSU-NWARC has shown considerable genetic variation in oil composition even though phenotypic (visual) variation can be nominal. Variations have been found for dates of maturity, yield, seed size, oil content, and disease resistance. Beginning in 2002, camelina research was initiated at Northwestern Agricultural Research Center, Kalispell, MT, to develop camelina as a feedstock

for the emerging biodiesel industry and to develop new cultivars with specific yield components suitable to Montana conditions. While common seeding of camelina may involve either broadcasting, broadcasting followed by packing, or bydrilling, cultivar selection has been carried out using a small plot drill in all cases. In Kalispell, no differences in seeding system have been observed.

Discussion: Duane J. stated that the life of these varieties may be relatively short as there are active breeding programs by WestBred and other companies.

Becky M. stated that there have already been requests for camelina varieties to the MSU Technology and Transfer Office.

John S. stated that we should make separate motions for each of the camelina varieties.

Motion by Duane J. that camelina variety MT 0301 (Blaine Creek) be considered for licensed release under Option “c” of the “Variety Release Policy”.

Second: Ray Ditterline

Discussion: Blaine Creek is high in linoleic acid and can be used as biodiesel fuel or for omega 3s; also is high in antioxidants; yields are good. There were 32 germplasm sources and the three on top are the three that are being discussed.

Becky M. asked if it is acceptable to define a variety from a group of selections obtained from the Plant Introduction. Ken Kephart said the selection has not segregated and it is stable in plant characteristics. Furthermore, it OK to do this if the person who submitted the material into collection as a Plant Introduction did not put any restrictions on it being used for variety development.

Jerry B. asked if it was self-pollinating and Duane J. said that it was.

Bill G. asked if this was a single seed descent and was 4 years adequate to obtain uniformity.

Duane J. stated that there were small plots initially, selections were made for plant height and lack of shattering. Subsequent review was made for oil composition, plant uniformity and yield.

John S. stated that we should assume for now that it is fine and these issues will be checked into before final approval by the MAES Director.

Duane J. said there has been no release of camelina since 1991.

John S. asked for a comparison of this variety with the other two.

Duane J. stated that this variety is the highest yielding, has the best shatter resistance and the highest level of omega 3s.

Fabian M. stated that camelina is a common weed in Europe and asked if camelina could become a weed here.

Duane J. stated that it has not been an invasive weed problem so far and 20,000 acres were planted last year.

Larry H. stated that on the north end of Yellowstone Park, Camelina microcarpa is a weed and asked if it would encroach on rangeland.

Ron L. asked if Duane was seeing any variance in the variety and Duane J. said no.

Ken K. stated that this is not the first time that camelina has been proposed as a crop. In the 1950's, it did not take hold as a weed.

Fabian M. said there are no statistics for rangeland and that all tests have been conducted on cropland.

Greg C. asked if you could tell the three lines apart.

Duane J. said that he could.

John S. asked where does the decision come from that something is a noxious weed. We need to be cognizant of this. Also, we are giving recommendations, not the final approval.

Fabian M. asked why the studies could not be done on the invasiveness of camelina into rangeland.

Duane J. replied that he did not know how to do the studies.

John S. said we should move forward and vote on the agronomic characteristics. Also he said the people who are concerned about the weed potential should vote against it.

Greg C. stated that there is a shrub nursery and roadways next to where it was grown and there was no weed problem at all on the NARC.

John S. asked if there were any volunteer plants from one year to the next.

Duane J. stated that they left the plants in the ground and they finally died in March.

Greg C. stated that in the chemical fallow, they were dead by the end of winter.

Duane J. stated that there was no seed dormancy that could be detected.

John S. asked if there was no dormancy, could it still be a weed?

Fabian M. said yes.

Ken K. stated that when there was small carryover into small grain production, the standard herbicide packet took care of it of the camelina volunteer.

John S. asked if camelina or canola can become a problem in rangeland?

Dave W. stated that in presence of a perennial grass crop, that camelina seed may grow. We should look into this.

John S. If this has already been grown in several areas, the horse is out of the barn.

Dan B. stated that in Canada, they are not concerned. In Europe, it is a contamination in flax. It is difficult to predict how it would behave in rangeland or disturbed soils.

Duane J. stated that it is designed to go into rotation with small grains.

Dan B. stated that they did let them grow it in Canada in the WestBred nurseries.

Fabian M. and others stated there is need for research to be done on how camelina sativa and other brassicas will be controlled in disturbed soils or rangeland.

Motion repeated.

Vote: 15 for, 1 against

Motion by Duane J. that camelina variety MT 0303 (Sun River) be considered as a licensed release under Option “c” of the “Variety Release Policy”.

Second: Bill Grey

Discussion: Duane J. stated that the performance of Sun River is average across a wide range of locations. It is ready to harvest earlier than Celine and it has the lowest levels of lodging. It also has a fairly good Omega three level.

John S. What makes it stand out?

Duane J. stated that the meal fraction is good for livestock.

John S. asked if the levels of toxins are low enough to make a difference.

Duane J. said that it is especially for fish markets because it has low phytates and glucosinolates

Ron L. asked if there are three varieties because there is a different market for each.

Duane J. said yes.

Ken K. stated that this one is listed in the GRIN database as a cultivated plant material and that it is being grown as a variety in Europe.

Ron L. said that we should put one variety out there for now.

Duane J. said that this one falls between the other two. If we leave out one, this would be the one to leave out.

Mary B. asked if this variety was susceptible to downy mildew.

Duane J. responded that they are all susceptible.

Ken K. stated that it was a disaster in irrigated areas.

Duane J. responded that it is not recommended for irrigated areas.

Motion repeated.

Vote: 0 for, 15 against (one procedural abstention)

Motion denied.

Motion by Duane J. that camelina variety MT 0305 (Wolff Creek) be considered as a licensed release under Option “c” of the “Variety Release Policy”.

Second: Dan Lake

Discussion: Duane J. stated that this variety was selected because of oil percentages. The yield were similar everywhere. It has less shatter problems and is low in phytates and glucosinolates. People in biodiesel are interested in this variety. It is a good yielder, low on shatter, high in oil percentages. This one is designed for low yielding environments. The average yield is 1300 lbs per acre.

Ken K. stated that '05 was the highest yielding line. This is the only variety he would consider for his area.

Motion repeated.

Vote: 16 for, 0 against

Horticulture and Native Plants Variety Release Committee		
Voting Members, 16	Affiliation	Appointing Administrator
<i>Chair, John Sherwood</i>	<i>PSPP Head</i>	<i>Director MAES</i>
1. Bill Hoch	Horticulturist	PSPP Head
2. Tracy Dougher	Horticulturist	PSPP Head
3. Mary Burrows	Plant Pathologist	PSPP Head
4. Bill Grey	Manager	MT Foundation Seed Program
5. Ron Larson	Manager	MT Seed Growers Association
6. Fabian Menalled	Weed Scientist	LRES Head
7. Perry Miller	Cropping systems	LRES Head
8. Wendell Morrill	Entomologist	LRES Head
9. Gregg Carlson		NARC Superintendent
10. Dave Wichman		CARC Superintendent
11. Greg Kushnak		WTARC Superintendent
12. Duane Johnson		NWARC Superintendent
13. Jerry Bergman		EARC Superintendent
14. Ken Kephart		SARC Superintendent
15. Dan Lake	Chair	MAES Advisory Board
16. Joe Scianna		Bridger Plant Materials Ctr. Research Horticulturist
Ex-officio Becky Mahurin	Dir. Technology Transfer	V.P. for Research, Creativity and Technology Transfer

**Motion by Joe Scianna for the selected class pre-varietal release of Opportunity Germplasm big bluegrass *Poa secunda* J. Presl (formerly *Poa ampla*).
Second: Tracy Dougher**

*Justification for this alternative release procedure is based on a critical need for well-adapted plant materials for acidic and heavy-metal contaminated sites in low to mid-mountain elevations in the foothills of central Montana and Wyoming. A lack of tested and adapted germplasm and the potential use of nonadapted seed sources further support selected class release. Additionally, this selection originates from a northern Rocky Mountain seed source that should prove well adapted to the conditions in the intended geographic area of use. Opportunity Germplasm big bluegrass was selected for superior percentage stand cover, vigor rating, mean plant height, and biomass production relative to other *Poa secunda* accessions tested. Opportunity Germplasm big bluegrass can also be used in other conservation applications such as post-fire reclamation, native range restoration, wildlife habitat enhancement, logging road revegetation, and mined land reclamation.*

Joe S. stated that Opportunity performed really well compared with thirty five other grasses, and always outperformed the other *Poa secunda* tested. It usually ranked in the top 3-5 of all

grasses tested on Stucky Ridge in lime amended, heavy metal contaminated soils. There will be fifty pounds of seed available in 2008.

Discussion: Ron L. asked how many generations are going to be allowed – G 1, 2, & 3?

Joe S. said yes.

Bill G. asked what distinguished Opportunity taxonomically from previous big bluegrass varieties.

Larry H. stated that taxonomists throw them all together and genotypically, they are all the same, but phenotypically are quite distinct.

Bill G asked where this grass was intended to be used.

Joe S. said that it would mainly be used for reclamation of mineland sites.

Bill G. stated that it has a very clear end use.

Motion repeated.

Vote: 16, 0 against

Definitions for Recommendation and Release

Variety release: “Releasing” a plant variety, specific plant population or germplasm by the Montana Agricultural Experiment Station, means the variety has performed to standards defined by the MAES Variety Release Policy, under Montana environmental conditions, to warrant making it available to the public through the Montana Foundation Seed Program or as a licensed release.

Variety recommendation: By “recommending” a plant variety, population or germplasm, MAES has determined that the variety has been tested for agronomic suitability for specific Montana agricultural districts and that it possesses superior expression of at least one trait with an acceptable level of performance for other agronomic and/or end-use quality traits.

John S. stated that he would like to clarify what the definitions are for these terms because many people are unclear what the definitions are and also there are no definitions for these terms in the variety release policy.

After discussion the definitions were revised as follows:

Variety Release: Release of a plant variety, specific plant population or germplasm by the Montana Agricultural Experiment Station, means the variety has performed to the criteria defined by the MAES Variety Release Policy, under Montana environmental conditions, and it is released to the Montana Foundation Seed Program and/or to the licensee.

Variety Recommendation: Recommendation of a plant variety, population or germplasm, means that the variety has performed in specific Montana Crop Districts 1-6 and that it possesses one or more desirable traits with an acceptable level of performance for other agronomic and/or end-use quality traits.