

Camelina



- **Great Northern Growers is a Montana Producer Cooperative dedicated to producing, processing, packaging, marketing, distributing and adding value to Montana grown agricultural products with a health and/or nutrition advantage to a world wide market**

- Nutrition and the farm: Where does our food come from, how has it changed in the last 50 years? Why is the wealthiest nation on earth so poorly nourished and one of the least healthy peoples of all first and second world nations? Have you read many labels lately, wondering what high fructose corn syrup is and why is it in your bread? What are trans- fats? If they cause heart problems, why are they in your potato chips and margarine? What is omega3? Why don't you have enough of it, where can you get it and do you have to eat fish to get it?
- These are all good questions. Americans are becoming very aware of what they eat and many are willing to pay for good health. This willingness brings the rise of the label items, such as "Heart Healthy", "May Reduce the Risk of Cancer", "No Trans Fat", "Good Source of Omega3". These are all catch words in the food industry today; they all describe camelina, also called gold of pleasure. Omega3 is not a fad. We desperately need more omega3 fatty acids in our diet.
- Camelina is very high in omega 3.

- Camelina (*Camelina Sativa* L.) is a small-seeded annual oilseed crop of the mustard family (family Brassicaceae also known as crucifers because their 4 pedaled flowers form a cross). Brassicaceae is a large family with over 3,000 species in about 350 genera - all herbaceous, many weedy annuals, but also perennials and biennials. The family contains species of great economic importance, providing much of the world's winter vegetables. These include [cabbage](#), [broccoli](#), [cauliflower](#), Brussels sprouts, [collards](#), [kale](#), [rutabaga](#), [turnip](#), [radish](#) and [kohlarabi](#). Other well known members of the Brassicaceae include [rapeseed](#) ([canola](#)), [mustard](#), [horseradish](#), [wasabi](#) and [watercress](#). The most intensely studied member of the Brassicaceae is the [model organism *Arabidopsis thaliana*](#). Although *Arabidopsis thaliana* has little direct significance for agriculture, it has several advantages that made it the model for understanding the genetic, cellular, and molecular biology of flowering plants. The small size of its [genome](#) made it useful for genetic mapping and [sequencing](#). It was the first sequenced plant genome, sequencing was completed in [2000](#). This family also includes many weeds common to Montana, including Field Pennycress (Fan Weed), Shepard's purse, Dyer's Woad, Tansey Mustard and Tumble Mustard.

Leindotter - Gold of Pleasure

- Camelina is adapted to the climatic and agronomic conditions of the arid high plains of Montana and few other areas of North America much like its close relative mustard. Montana farmers are in need of a true rotation crop for wheat and Camelina will add substantial dollars to bottom lines as well as new industry to rural Montana. Camelina thrives under marginal climatic conditions on marginal soils.
- Today Camelina is produced in Slovenia, Ukraine, China, Finland, Germany, Austria and Montana.

- Cultivation, as evidenced from carbonized seed, has been shown to occur in regions surrounding the North Sea during the Bronze Age. Camelina monocultures occurred in the Rhine River Valley as early as 600 BC

The **Tollund Man** lived during the [4th century BC](#), during the time period characterized in [Scandinavia](#) as the Pre-Roman [Iron Age](#). He was buried in a [peat bog](#) on the [Jutland Peninsula](#) in [Denmark](#). Such a find is known as a [bog body](#). Tollund Man is remarkable for the fact that his body was so well preserved that he seemed to have died only recently.

The stomach and intestines were examined and tests carried out on their contents. The scientists discovered that the man's last meal had been a kind of soup made from vegetables and seeds, some cultivated and some wild: [barley](#), [linseed](#), gold of pleasure ([Camelina sativa](#)), [knotweed](#), [bristlegrass](#), and [camomile](#).

From Wikipedia, the free encyclopedia

- It is suggested that Camelina, with its high content of unsaturated fatty acids (approx. 90%), was more difficult and expensive to hydrogenate than oilseed rape (canola), and this led to its decline. Hydrogenation is the process that creates trans-fatty acids, which must be listed on labels, starting 1/1/2006 because of the linkage between trans-fats and obesity, CVD, diabetes and other health disorders.



28/06/2005



17/06/2005





20/07/2005

December 31 2005





04/12/2006



06/23/2006

Ally Recrop --- Chem Fallow



06/23/2006

Ally

05/23/2006



06/20/2006



06/20/2006



05/20/2006



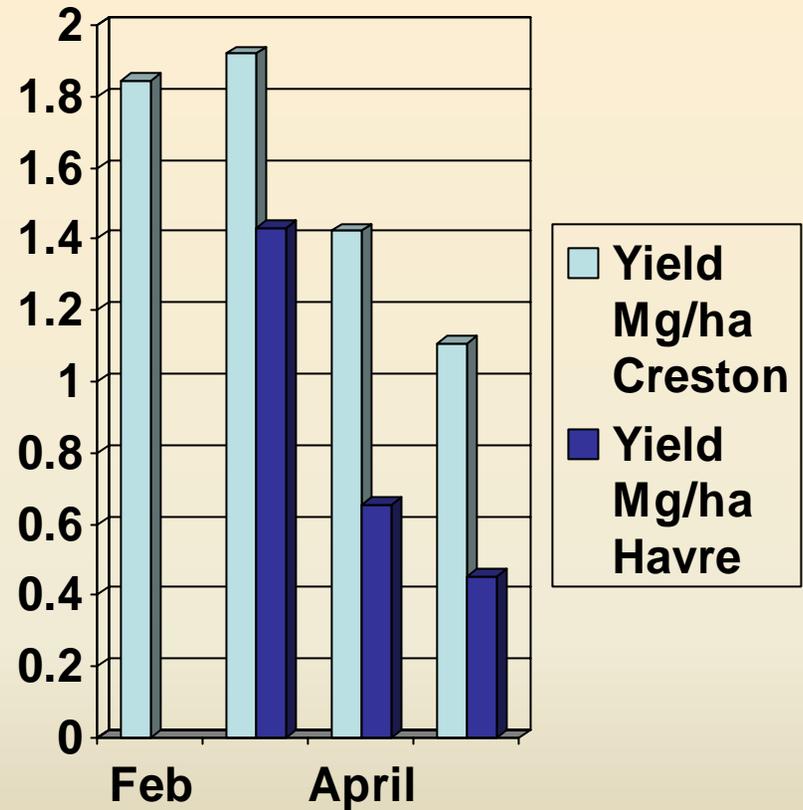
07/10/2006

No-Till Dryland Oilseed trials: NARC, Havre, MT, 2005

Crop	Planting date	Yield lbs/acre	Test wt. lbs/bu	Gross Return \$/acre	Net Return \$/acre
Celine Camelina	March 15	1585	52.5	142.61	105.61
Celine Camelina	April 20	731	51.1	65.85	27.85
MT 1 Camelina	March 15	1789	51.6	161.04	123.04
MT 5 Camelina	March 15	1590	53.2	143.14	105.14
Canola	April 25	514	51.7	40.32	-48.68
Flax	April 25	1146	53.2	109.60	21.60
Mustard	April 25	442	54.5	49.55	-18.45

Yield Response to Planting Date 2006

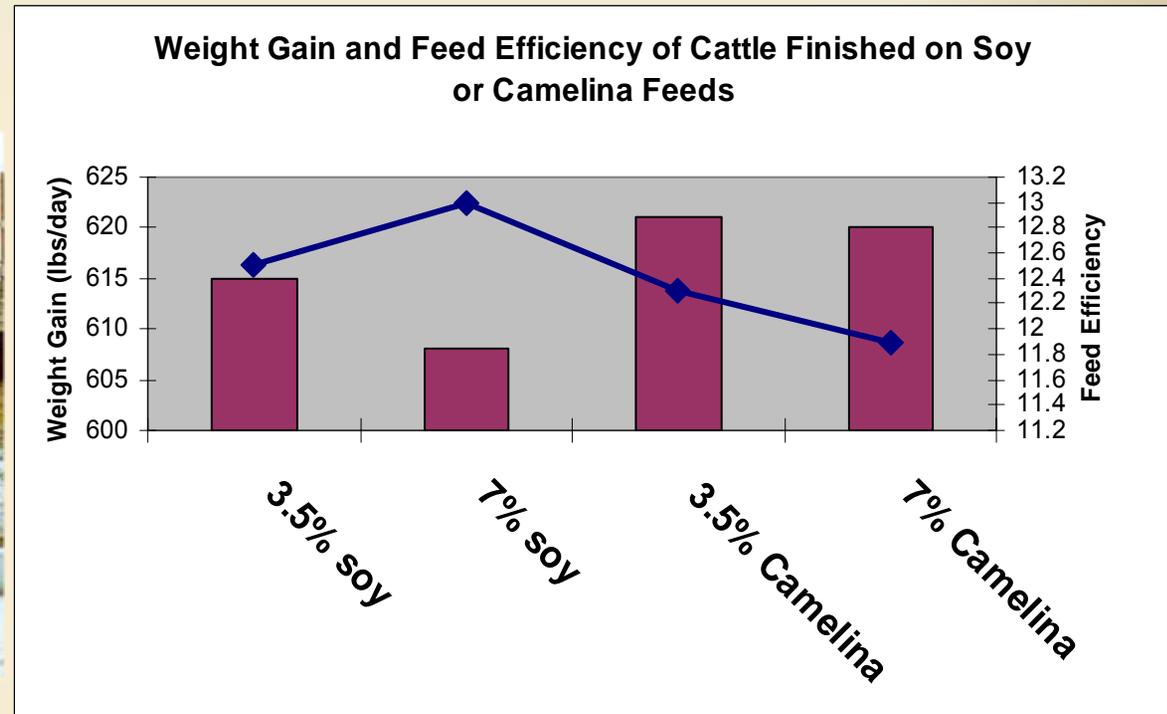
- Camelina is highly adaptable to cold seeding
- Highly frost resistant
- Seeding after March 30 resulted in yield losses of 100 lbs/week of delay (45 kgs/week)



Production of high omega-3 beef

(Darrin Boss, MSU-NARC)

Meal



Research was funded by the MSU Biobased Institute (USDA CSREES Special Grant).

Finished Cooked Beef Study: Camelina- versus Soybean-fed Steers

Fatty Acid in Medium Cooked Hamburger	Camelina % of fat	Soybean Meal %of fat
Oleic (monounsaturate)	46.93	43.15
Linoleic 18:2 (polyunsaturate)	2.18	1.55
Linolenic 18:3 omega 3 (polyunsaturate)	0.61	0.63
EPA Omega 3	0.03	0.02
DHA Omega 3	0.31	0.11

Significant differences indicated in red (probability of error=0.0001)

Tocopherol: Vitamin E

	Camelina	Flax	Canola
α - Tocopherol	7	38	37
β - Tocopherol	0	0	0
γ - Tocopherol	255	0	66
δ - Tocopherol	4	0	2
Total Vitamin E	266	38	105

Data provided by Great Northern Growers, 2005



07/15/2006



07/15/2006



07/16/2006

OmegaMeal™, CamOmega™ Oil, OmegaMontana™ Eggs

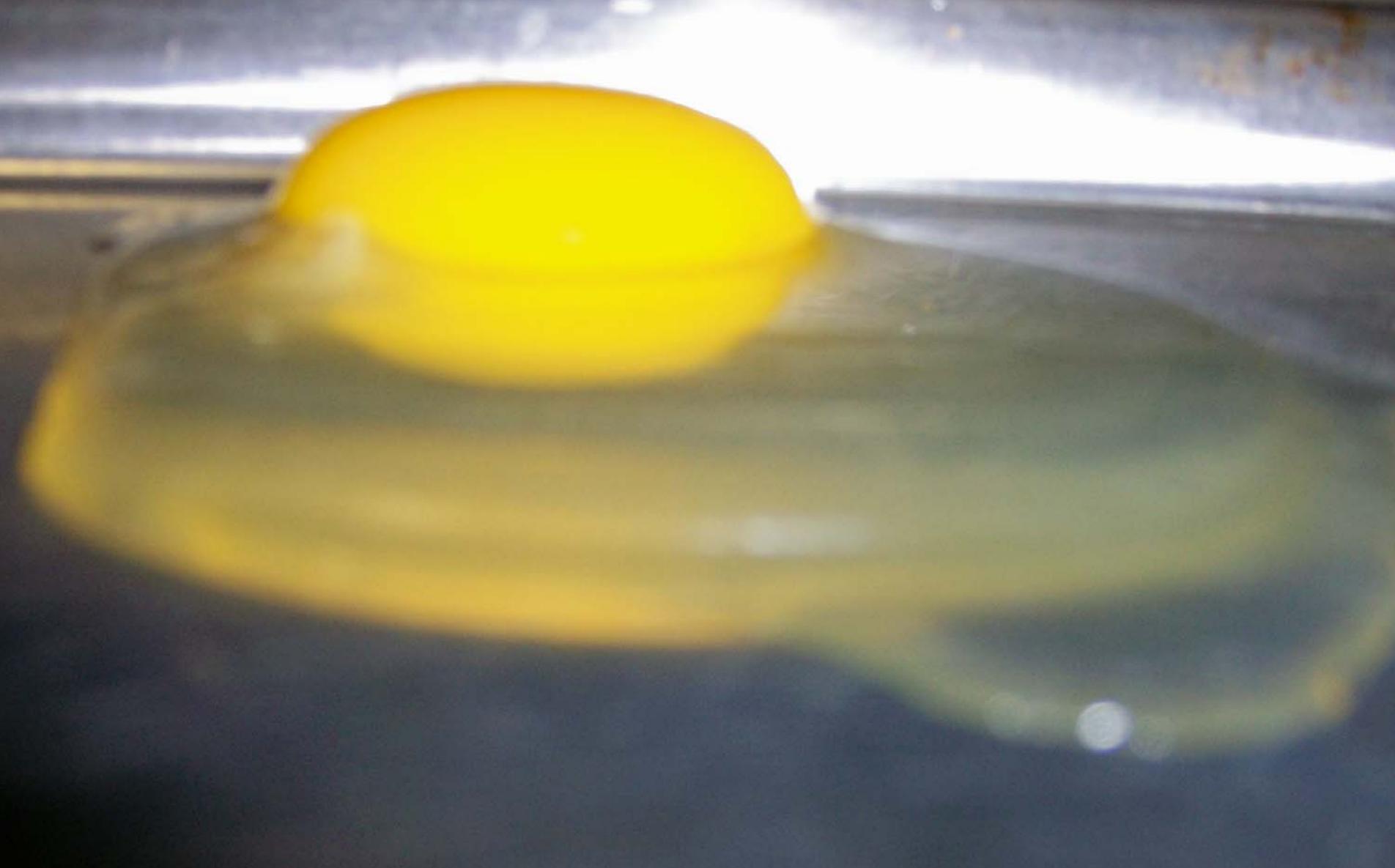
- Produce, Process and Market
- How Much Can We Produce?
- Process Where?
- What Market?

- I couldn't help but clip this bit from the January 2, 2007 edition of USA Today:
- -----
- **By Bruce Horovitz, USA TODAY**
- It's barely January, but there's no doubt what one of 2007's hottest food additives will be: omega-3.
- The name may sound like a sci-fi film, but omega-3 — fatty acids found, for example, in fish and some nuts and oils — are increasingly being added to other foods, often via fish oil or flax seeds.
- Tropicana this month will roll out the first national orange juice with omega-3. Kellogg put it into a Kashi cereal. Unilever put it in I Can't Believe It's Not Butter.
- Food marketers' primary target is the 79 million baby boomers, because omega-3 has been shown to cut risks of heart disease and maybe other diseases, including Alzheimer's. Four in 10 adults are seeking more omega-3s in their diets, according to a HealthFocus USA Trend Survey.
- -----

- Some of the laying hens at Kingsbury Colony have been on a new diet consisting of the partially defatted meal of camelina. The product is Montana grown and processed OmegaMeal™ which has replaced the soy meal from Minnesota, Nebraska or South Dakota and canola oil produced in Canada in the standard ration used at most Montana Egg Producers layer barns. The eggs produced have 150 mg of Omega 3 fatty acid vs. 0 in the standard ration eggs, the omega 6 omega 3 ratio is a healthy 4 to 1. The vitamin E is 4 times higher, cholesterol is 15% lower. Camelina eggs have 20% less saturated fat. The tone or shape of the egg is what professional chef's want, with high firm albumen (egg white) sloping up to a crowning yolk, not flat plateaued and runny, as we have become used to with ordinary commercial eggs. Not only are these eggs better for you, the eggs taste better too! You will be seeing these Omega Montana™ eggs at your supermarket soon.

Which egg would you like for breakfast





02/11/2007

- Deep in the heart of the Montana's bread making industry are some entrepreneurial bakers using CamOmega™ oil in their bread making. Camelina oil makes a light tasty loaf of bread that has as much omega 3 in each slice as an omega 3 supplement capsule. You will be seeing this bread on your supermarket shelf soon.

- Down in California there is a pet food manufacturer using Montana CamOmega™ oil and OmegaMeal™ in high end canine and equine rations to improve the health and vitality of valuable pets.

- **Animal Naturals Presents:
OmegaDog
Extra Virgin Camelina Oil!**



Always check the label

- **What's In It?**
- Serving Size: 1 Scoop (15 g)
Servings Per Container: 32
- Amount Per Serving:
- Protein 15%
- Fat 54%
- Fiber 10%
- Moisture 6%
- Ash 6%
- Carbohydrates 8%
- Ingredients:
OmegaLipids™ Camelina Sativa Meal, Rice Bran, Chicken fat, Beef fat, Cold pressed Camelina sativa seed oil, CLA (Conjugated Linoleic Acid) PrimalProtein™ Chicken powder, Dried bison, Dried venison, Dried bison tripe, Dried elk, Nutri-Fruits™ Freeze-dried strawberries, Freeze-dried blueberry powder, Freeze-dried raspberry, Freeze-dried apricot, Cranberry powder, Freeze-dried broccoli, Freeze-dried cauliflower, Freeze-dried carrots, Freeze-dried peas, Freeze-dried spinach, Freeze-dried apples, Whole barley grass, Freeze dried peach, Nuts™ Walnuts, Pine nuts, Pistachio nut meat, Wild Factors™ Chicken cartilage, Beef cartilage, Creatine monohydrate, ALA (alpha lipoic acid), Ribose, L-Carnitine, Lactobacillus acidophilus casei, Natural mold inhibitor. No sugar, trans fats, fillers, colorings, MSG, Soy, Lactose.
- Directions: Mix with any raw diet or feed alone for a great snack, trail mix, or travel treat. Mix with kibble, wet or dry.
- For Dogs:
- 0-25 lbs. use 1/2 scoop.
- 26-75 lbs. use 1 scoop.
- 76-100 lbs. use 1 1/2 scoops. *These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.*

Have you ever met an OmegaHog?



Data from the hog carcasses graded by Wade Crouch Cascade County Extension Agent February 8th 2007

- Camelina fed animals;

• Live Wt.	Hot Wt.	Back Fat	Loin Area	Marbling	Color	Firmness	Wetness
• 290	170	.5	5.4	5	4	2	2
• 240	150	.4	6.8	4	5	3	3
• 230	145	.4	5.2	4	3	2	2

- Soy fed Animals;

• 305	190	.35	7.7	4	4	2	3
• 243	140	.25	6.4	5	4	2	2
• 253	157	.35	6.9	3	4	3	3
• 280	178	.7	6.5	3	3	2	2

- The numbers for color firmness and wetness all fall in the acceptable range. There was no visual difference between the two groups as far as quality of fat or overall carcass quality. I could not feel any textural difference of the back fat. They looked pretty much as I would expect them to except for the 290 pound animal. It should have a larger loin eye at that weight. Other than that, nothing stands out in either group.

- Much of Montana's 2006 camelina oil is on the way to cosmetic manufactures replacing other more expensive omega 3 oils.
- Check out L'ORÉAL® VIVE Shampoo and Conditioner in the bright orange bottles; camelina sativa seed oil!!!

- Plant it and they will come! As in the movie, Field of Dreams, some one has to take the initiative to start the ball rolling. Whether the chicken or the egg comes first, the first step must be taken. If Montana wants to have a future in the oilseed industry, it is up to Montana growers to make the first move. Plant camelina.

The Camelina Train is Coming



All Aboard the Camelina Train





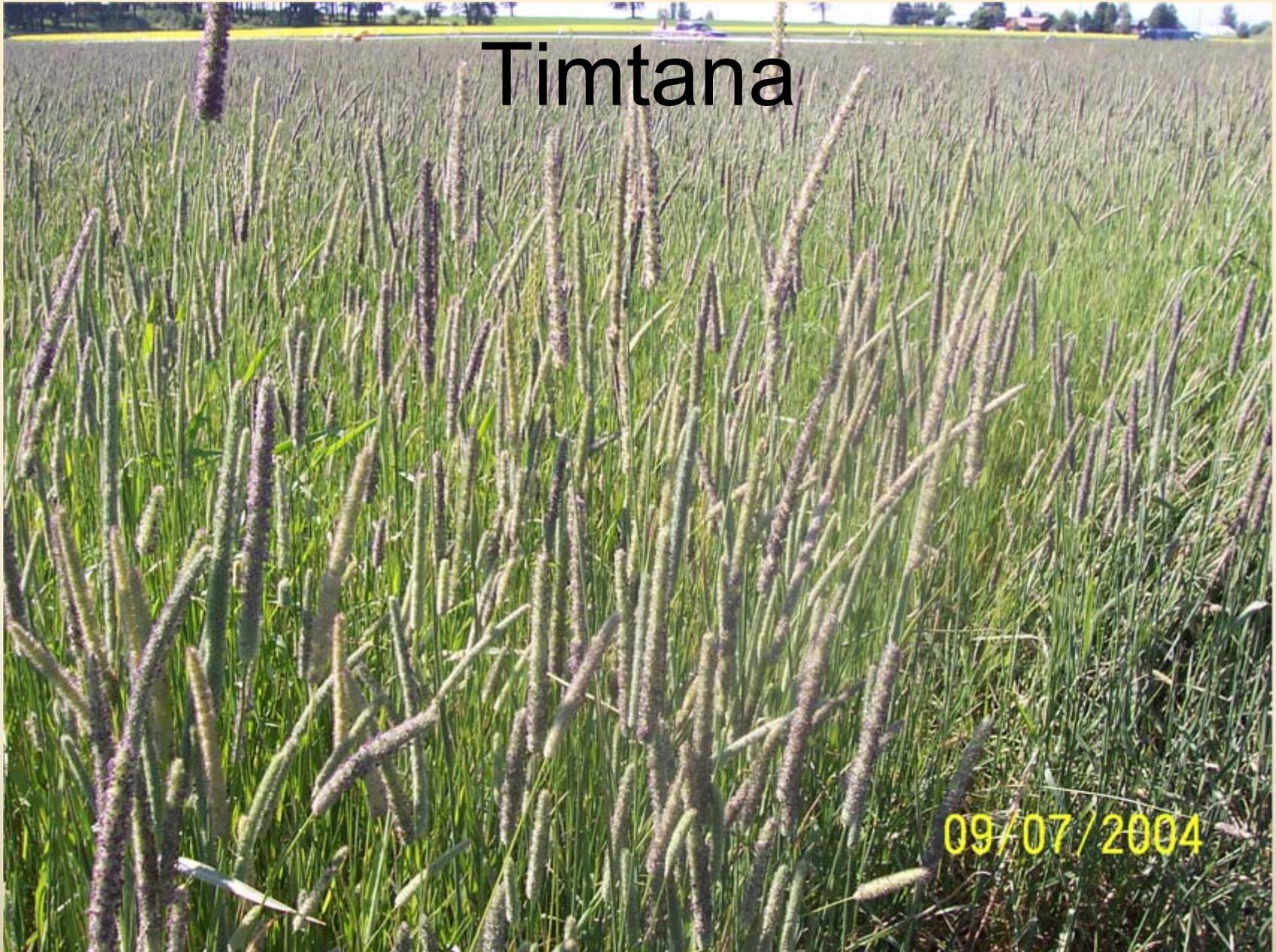
PrOatina™





12/08/2005

Timtana



09/07/2004

Fenugreek



09/07/2004

Low Glycemic Peas



15/07/2004

Great Northern Growers Cooperative Board of Directors

- Greg Woods, Hill
- gwoods@greatnortherngrowers.com 759 3240
- Bruce Wright, Gallatin,
- osmose@direcway.com 587 7720
- Mike Wallewein, Toole,
- wallywld@northerntel.net 937 2775
- Carl Mattson, Liberty,
- cmattson@mgga.org 460 3622
- Dean Miller, Gallatin,
- ddm@greatnortherngrowers.com 388 7771
- Gary Iverson Executive Director,
- giverson@greatnortherngrowers.com 937 4000
-
- **Contact information:** Great Northern Growers Cooperative, 1 Railroad Ave., Box 99, Sunburst, Mt. 59482.
- www.greatnortherngrowers.com



Great Northern Growers

MONTANA PRODUCER COOPERATIVE