

# FY2008 Pacific Northwest Canola and Rapeseed Program Annual Report

The FY2008 appropriation for the Pacific Northwest Canola and Rapeseed Program was **\$126,466**. There were seven proposals submitted for funding consideration with requests totaling **\$134,151**. Upon completion of the peer review process, four “**New**” projects were funded totaling **\$63,349**. The remainder of the FY2008 award was dedicated to funding second year projects that were carryover funding obligations from FY2007. The FY2007 “**Carryover**” projects totaled **\$33,113**.

The regional breakdown of funding by institution for the FY2008 appropriation was as follows:

University of Idaho	\$63,668
Montana State University	\$50,065
Washington State University	\$12,733

**FY2008 PNWCRP - Four “New” projects were approved totaling \$63,349.**

1. **PNWCRP 08.01** - *Investigating Different Canola Cultivars in Response to Environments and Nitrogen in Montana.* Chengci Chen, Montana State University. Two-year project awarded Year 1 and Year 2 @ **\$23,750**.
2. **PNWCRP 08.03** – *Investigation of Cabbage Seedpod Weevil Resistance Mechanisms in Yellow Mustard and Canola x Yellow Mustard Trials.* Sanford Eigenbrode, University of Idaho. Two-year project awarded Year 1 @ **\$12,949** (remaining obligation in FY2009 for Year 2 is \$9,831).
3. **PNWCRP 08.06** – *An Evaluation Scheme to Identify Superior Cultivars of Winter and Spring Canola that are Suitable for Production in Idaho and Other Regions of the Pacific Northwest.* Jack Brown and Jim Davis, University of Idaho. Two-year project awarded Year 1 @ **\$12,835** (remaining obligation in FY2009 for Year 2 is \$12,826).
4. **PNWCRP 08.07**– *Strategies for High Yielding Winter Canola in the Rocky Mountain Region.* Perry Miller and Jeff Holmes, Montana State University. One-year project awarded @ **\$13,815**.

**FY2008 PNWCRP - Three “Year 2” (carryover obligations from FY2007) projects were approved totaling \$33,113.**

**PNWCRP 07.03** – *Identify winter canola cultivars suitable for the traditional wheat-fallow region of the PNW.* J. Brown and J. Davis, University of Idaho. Two-year project awarded \$13,696 for 2007 and **\$7,880** for FY2008.

**PNWCRP 07.05** – *Testing Spring and Spring x Winter Hybrid Canola Cultivars for Seedling Cold Tolerance and Yield in Montana.* C. Chen, Montana State University. Two-year project awarded \$10,000 for 2007 and **\$12,500** for 2008.

**PNWCRP 07.09** – *Identification and Control of Soilborne Canola Diseases in the Pacific Northwest.* S. Hulbert and T. Paulitz, Washington State University. Two-year project awarded \$9,794 for FY2007 and **\$12,733** for FY2008.

# PNWCRP Progress Report

## March 2009

### Outputs:

- The effect of 4 row spacings and two sowing rates of winter canola were investigated near Pendleton, OR. The main plots were row spacing and the subplots were sowing rates.
- A winter canola agronomic trial was established near Bozeman, MT to determine optimum fall irrigation amount, seeding dates, cultivar, and seeding rate.
- A winter rapeseed and canola variety trial with 24 canola or industrial rapeseed cultivars or advanced breeding lines was grown at seven locations in the inland PNW, and a spring canola and rapeseed variety trial with 40 cultivars or advanced breeding lines and five control cultivars was grown at 10 locations in OR, WA, and ID.
- A spring trial comparing direct seed drill openers with three Brassicaceae species at three seeding rates across three straw management practices was conducted in northern ID.
- The effects of varying available N rate and seeding rate on two canola-quality *Brassica juncea* cultivars, Arid and Dahinda, and the condiment oriental mustard cultivar Pacific Gold was determined at two locations and two planting dates in conventional and direct seeding systems in northern ID and in Pendleton, OR.
- Studies were conducted to determine the timing of irrigation on growth, seed yield and oil concentration of canola cultivars grown under various irrigation regimes near Prosser, WA.
- Imazamox resistant spring canola (Clearwater) and rapeseed (Gem) were grown in field trials and treated with increasing imazamox doses to determine the effect of increased herbicide rate on yield.
- A study was initiated to develop adapted spring canola lines that are tolerant to high soil residuals of imidazolinone class herbicides (i.e. imazethapyr) and with resistance to glyphosate herbicide. These genotypes could be planted on soils with imazethapyr residuals and weeds can be controlled using glyphosate. All aspects of this study were carried out under controlled glasshouse conditions that avoid unwanted cross pollination between plants.
- Thirty-seven commercial varieties and breeding lines from the University of Idaho and other sources were used for field small plot and growth chamber study at

Montana State University to determine freezing tolerance of canola seedlings, and biomass and seed yields of early spring planted canola.

- A national canola website is maintained to provide information from research projects to growers and oilseed industry representatives.

### **Impacts:**

- Winter canola sown on 6 or 12-inch spacing yielded better than canola sown on 24 or 30-inch spacing.
- Fall irrigation and an early September seeding date were most important for winter survival and canola seed yield in MT. It is likely that winter canola can become a valuable component in irrigated cropping systems in northern Rocky Mountain Front regions.
- Winter canola mean yield by location ranged from 2,217 to 4,311 lb/A, and mean yield of individual cultivars across locations ranged from 2,216 to 4,141 lb/A. Mean yield of the spring cultivars ranged from 1,404 to 2,338 lb/A when averaged across sites, and for individual locations ranged from 757 to 2,957 lb/A. This research shows which cultivars are most adapted to different regions within the PNW. These data will help plant breeders and seed companies select the best cultivars for the region. Identifying adapted, high-yielding cultivars helps guarantee highest yields and economic returns, which increases the acreage of canola grown in the PNW.
- Canola and mustard stands from a Case single disc drill were lower than a Flexicoil drill, but there was no difference between plant stand and straw management.
- Canola seed yield improved with increasing N; and a moderate seeding and early planting rate maximized yield.
- It is important not to over irrigate winter canola. Canola should be stressed to stimulate deeper root development to take advantage of deeper soil moisture and nutrients. Crop establishment in the fall is critical to winter survival therefore, soil moisture should be optimum for seed germination and seedling development. Supplemental irrigation during the fall is beneficial to canola stand establishment in dryland cropping systems.
- Visible herbicide injury symptoms were observed at the highest imazamox application rate on Clearwater canola and Gem rapeseed, but both cultivars showed high levels of tolerance to imazamox herbicide and had the highest seed yield. These cultivars will allow growers opportunities to include a Brassica crop in crop rotations and control problem weeds. The imazethapyr tolerant canola types were crossed to the glyphosate resistant types and seed from the crosses was harvested and planted back to produce

second cycle progeny to develop lines homozygous for the resistance genes. These cultivars offer canola growers the opportunity to include legumes in their crop rotation and legume growers to include canola in rotation with small grain cereals.

- Great variation was observed among the canola entries for their emergence rate, biomass accumulation, and seed yield, indicating the existence of potential genetic differences in adaptation to cold regions of the Northern Great Plains. Several cultivars show favorable characteristics such as early emergence, faster biomass accumulation, less frost damage, and high yield potential. Development of cold tolerant canola cultivars will boost production for biodiesel in the Northern Great Plains.
- The oilseed website URL is <http://www.uscanola.com/>.

### **Publications:**

1. Chen, C. 2007. Oilseed crops for biodiesel production in Montana. Montana DEQ Oilseeds and Biodiesel Workshop. Livingston, MT, January 9.
2. Chen, C., G. Jackson, J. Hesser, and K. Neill. 2006. Seedling cold tolerance and yields of early seeded canola. 2006 U.S. Canola Association National meeting in conjunction with ASA-CSSASSSA International Annual Meetings, November 12-16, Indianapolis, Indiana.
3. Chen, C., G. Jackson, K. Neill, D. Wichman, G. Johnson, and D. Johnson. 2005. Base temperature for germination, planting data and rate, and seedling cold tolerance of *Brassica napus*. *Agron. J.* 97:1252-1262.
4. Davis, Jim B., J. Brown, and D. Wysocki. 2006. Pacific Northwest Spring Canola Variety Trial 2006. A flyer published by the University of Idaho Canola Program.
5. Davis, Jim B., J. Brown, and D. Wysocki. 2006. Pacific Northwest Winter Canola Variety Trial 2005-2006. A flyer published by the University of Idaho Canola Program.
6. Davis, Jim B., J. Brown, and D. Wysocki. 2007. 2006 Pacific Northwest Spring Canola Variety Trial Results. <<http://www.ag.uidaho.edu/brassica>>.
7. Davis, Jim B., J. Brown, and D. Wysocki. 2007. 2006 Pacific Northwest Winter Canola Variety Trial Results. <<http://www.ag.uidaho.edu/brassica>>.
8. Hang, An N. and Harold P. Collins. 2006. Water Used Efficiency and Nutrition Management of Winter Canola. Abstract. ASA, CSSA, and SSSA Abstract 2006 International Annual Meetings - US Canola Association. Indianapolis, IN. [www.crops.org](http://www.crops.org). (24-6).

9. Miller, P., and D. Johnson. 2006. Strategies for high yielding winter canola in the Rocky Mountain region. In Agronomy Abstracts, ASA-CSSA-SSSA Ann. Mtg., Nov 12-16, 2006. Indianapolis, IN.
10. Olmstead, J. 2006. Optimum agronomic practices for *Brassica juncea* in the Pacific Northwest. M.S. Thesis. Univ. of Idaho.
11. Olmstead, J., J. Brown, D. Wysocki and J.B. Davis. 2005. Determine optimum agronomic practices to maximize productivity of canola-quality oriental mustard (*Brassica juncea*). University of Idaho Canola, Rapeseed and Mustard Program website <<http://www.ag.uidaho.edu/brassica/>>
12. Olmstead, J., J. Brown, J.B. Davis. 2005. Determine optimum agronomic practices to maximize productivity of oriental mustard (*Brassica juncea* L.) in the Pacific Northwest. American Society of Agronomy 98<sup>th</sup> Annual Meeting. November 6-10, 2005.
13. Olmstead, J., J. Brown, J.B. Davis and D. Wysocki. 2005. Determine optimum agronomic practices to maximize productivity of oriental mustard (*Brassica juncea* L.) in the Pacific Northwest. Western Society of Crop Science Annual Meeting. June 19-22, 2005.
14. Olmstead, J., J. Brown, D. Wysocki and J.B. Davis. 2004. Determine optimum agronomic practices to maximize productivity of canola-quality oriental mustard (*Brassica juncea*). University of Idaho Canola, Rapeseed and Mustard Program website <<http://www.ag.uidaho.edu/brassica/>>