

Part 4. Bioenergy Cropping Systems Research

The "Oilseed Based" Washington State Biofuels Cropping Systems (WBCS) Project

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First funded by the WA State Legislature in 2008 with support from WSDA, WA Dept. Commerce and the WSU Energy Program, the WBCS statewide project has supported more than 70 WSU and USDA ARS researchers, extension faculty and staff, and graduate students, addressing the wide variation of cropping conditions and systems of WA state. Current researchers are conducting new oilseed production research and technology development. Core state funding is leveraged with federal funding of PNW oilseed research from core USDA ARS, USDA NIFA (REACCH, Sun Grant), National Science Foundation (NSPIRE) and US Environmental Protection Agency (RACC).

The WBCS Extension leads, coordinates and links to growers, ag suppliers, grain storage and transporters, government policy makers, oilseed processors and end users are facilitating integrated expansion of feedstock production and end use for biodiesel, animal feed, and potentially future food grade oil and specialty chemicals in Washington State.

Over the past 5 years, WA oilseed production, WA processing facilities and WA biodiesel use have significantly increased over the past five years. A statewide oilseed crushing has increased to 350,000 T/y and processing capacity has grown to 109 MGY (<http://css.wsu.edu/biofuels/files/2013/02/Lang-WSU-Oilseed-Production-Workshop-Jan-2013.pdf>). Urban demand for state produced biodiesel is connecting western and eastern WA on numerous planes. For example, the Seattle/Islands Ferry system has aggressively set goals, tested and increased use of in-state biodiesel, resulting in a four-fold increase in biodiesel use over the past four years. Good for the ferry passenger health and the environment, while promoting WA businesses and supporting progressive farmers.

Oilseed feedstock production is specifically identified in Governor Inslee's 2013-2015 Strategic Budget Plan to "encourage the growth of oilseed farms" (<http://www.ofm.wa.gov/budget13inslee/presspacket.pdf>). The research and extension abstracts below represent the hard work and dedication of statewide faculty, staff and students towards this vision for oilseed diversification of our wheat-based cropping systems.

Oilseed Extension and Outreach Activities and Outcomes

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The faculty and staff involved with the Extension and outreach portion of the Washington State Biofuels Cropping Systems Research and Extension Project (WBCS) and related dedicated to 1) the transfer of research results to farmers and industry to improve oilseed production practices, 2) bringing questions from new and experience oilseed producers to the researchers to answer through innovative research, and 3) creating and participating in events where oilseeds are featured. Field days, Extension publications, farm visits, the WBCS website (<http://css.wsu.edu/biofuels>), presentations at local and national meetings, and the annual WSU Oilseed Production and Marketing Conference are the primary means of education to reach these goals throughout the year.

Attendance at oilseed-related events surpassed 2000 people last year. Collaboration with industry resulted in presentations at several more industry field tours last year. The 2013 Oilseed Conference attracted over 200 attendees, with a significant increase in the number of speakers, sponsors, and financial support. Nearly all WBCS faculty were presenters at the event. Responses to onsite clicker surveys indicated 42% of participants attended a previous oilseed workshop, and 71% of those learned a principle or practice that helped them with oilseed production, and that increased to 93% of attendees of the 2013 conference. The survey also indicated 39% of oilseed growers in attendance experienced an 11-20% increase in wheat yield following an oilseed, while 14% of the growers saw a 14% increase in wheat yield.

We have developed separate email list serves for growers, industry, educators, and agency to send information as deemed necessary throughout the year, e.g. field day notices, oilseed insurance updates, oilseed delivery points in the PNW, and new publications. The WBCS website has a steadily increasing number of visits; in 2012 there were more than 2500 visits from 21 countries, 31 states, and 45 cities in Washington. Since last summer, Extension fact sheets

about camelina production, winter canola in rotation with winter wheat, and a second set of case studies of oilseed producers were published. A concerted effort is being made the rest of this year to publish fact sheets covering a range of topics from the WBCS project, such as oilseed diseases, biennial/dual purpose winter canola, case studies of irrigated canola producers, enterprise budgets, wide row canola spacing for spring canola, oil quality analysis, and more.

Recently released data from USDA-NASS shows a projected increase of canola acreage in WA from 15,000 acres in 2012 to 25,000 acres 2013, a reflection of strong markets, favorable growing conditions, and the extension and outreach efforts of the WBCS and its affiliate projects. Future plans are to coordinate regional oilseed extension and research efforts more closely, as outlined in a recently submitted PNW Oilseed grant proposal submitted to USDA NIFA, which would involve Montana, Idaho, Washington and Oregon.



Winter Canola Production in the Low- to Intermediate-Rainfall Zones of the Pacific Northwest

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Background: Approximately 60% of the rainfed production area of the PNW is in the winter wheat/summer fallow system. This system is plagued by winter annual grass weeds such as jointed goatgrass, feral rye, and downy brome. Several years ago a grower in Douglas County, WA experienced a \$1.45/bu dockage in his winter wheat because of feral rye contamination. Growers have become increasingly interested in producing winter canola in this region to improve pest management strategies, diversify markets (food, fuel, and feedstock), and increase sustainability. However, winter canola stand establishment is an impediment to growers in the non-irrigated, low- to intermediate-rainfall zones. Previous funding from the WBCS allowed us to initiate the first-ever winter canola seeding date and rate studies in these zones to improve canola emergence and stand establishment. Data indicate that the optimum time to plant winter canola in the fallow region is between July 25 and August 25 and most importantly when "Mother Nature tells you", i.e., when cooler temperatures (85°F) are forecast after planting. At the present time, there has been no research on winter canola variety trials in the wheat/fallow region. The U of I conducts variety trials in the irrigated area, high rainfall annual cropping region, and the high-end of the intermediate rainfall zone. Varieties that tolerate cold temperatures and open winters need to be found for this region to reduce production risks. As with winter canola, very little spring canola research has been conducted in the wheat/fallow region with the exception of determining the effect of planting methods on spring canola establishment, yield, and oil quality. In the PNW, winter annual grass weeds (especially feral rye) are a major problem in winter wheat. The only effective control measure for feral rye in the