WSU-WOCS Extension & Outreach: The Link from Research to Stakeholders

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After nearly twelve years of field, greenhouse, and laboratory research, the Washington State Oilseed Cropping Systems (WOCS) project has compiled a significant volume of data and results that are tremendously valuable to stakeholders in Washington state and surrounding states. The catch is how to most effectively share all we've learned, and that is where the Extension and outreach portion of the WOCS program plays an ongoing, and critical role. Field tours are a traditional method to convey information, but we have found that a wide range of communication is key to reaching more people and being the 'go to' resource when growers, crop consultants, and others have questions about anything oilseed related. The WOCS website (www.css.wsu.edu/oilseeds) contains information ranging from variety trial results to Extension publications to presentations. Facebook (WSU Oilseeds) has been effective to announce upcoming events and current field reports, and emails, phone calls, farm visits, radio interviews, 'stop 'n' talk' field tours, and texts are a year-round means of staying in touch with stakeholders. We are part of the Dryland Crops Team at WSU, the WA Oilseed Commission, and the PNW and U.S. Canola Associations. The annual WOCS oilseed workshops were a success once again, with 253 individuals attending the two locations, and 115 of those were first-time attendees (Fig. 1). Outreach beyond Washington state has strengthened collaboration between PNW university colleagues. The culmination of all that the WOCS team has produced, along with neighboring universities, will be the publication of a PNW Canola Production Guide. Canola acreage increased again in 2018 in WA (65,000 acres) and the 4-state PNW region (230,000 acres). We believe in order for that trend to continue, the oilseed research and Extension efforts of the WOCS project needs to strive to meet the educational needs of all involved in the oilseed industry in Washington state.

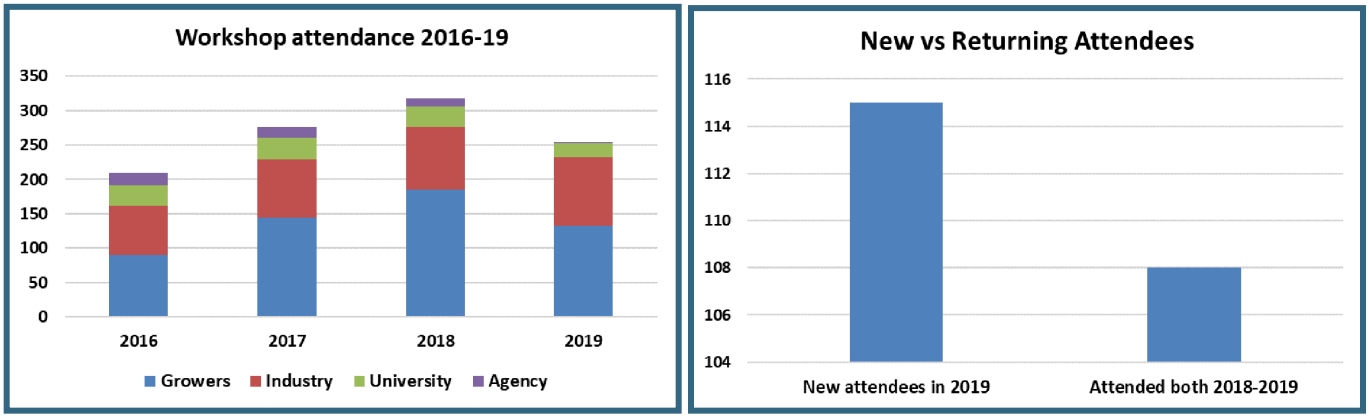

Figure 1. Attendance trends at WSU-WOCS Oilseed Workshops (left), and first-time attendees in 2019. (right).

Soil Nitrogen and Water Relations with Winter Canola Nitrogen Use Efficiency

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Nitrogen (N) losses from fertilizers are an abundant pollutant in agricultural regions world-wide. Maximizing nitrogen use efficiency (NUE) is critical to reduce adverse environmental effects of fertilizer and obtain an economic return on inputs.

Winter Canola (*Brassica napus* L.) has an N requirement higher than wheat (*Triticum aestvum* L.) but has demonstrated limited responses to N fertilizer in the inland Pacific Northwest (iPNW). Nitrogen rate and timing trials were conducted at four sites during the 2017-18 crop year. Nitrogen was applied as surface granular urea at three timings of fall, spring, and split application, with split being 50% applied in fall and 50% in spring, in five rates from 0 to 240 kg N ha^{-1}. Soil samples were collected in the fall and spring prior to fertilization and post-harvest, then analyzed for N and moisture content. Spring plant samples and harvest yield and biomass data was collected, with plant and seed components analyzed for N content. Nitrogen use efficiency calculations for each season determined that NUE declined with increased rates of fertilizer. Maximum yield and nitrogen use efficiency (NUE) both increased with increased available water, whereas unit N requirement, the inverse of NUE, diminished with increased water availability. Ideal unit N requirements are between 0.05 and 0.09 kg Ns kg seed $yield^{-1}$. Our research findings suggest that residual N measurements to 180 cm soil depth and considering the local water regime are the most important factors to consider when making N management decisions for winter canola.

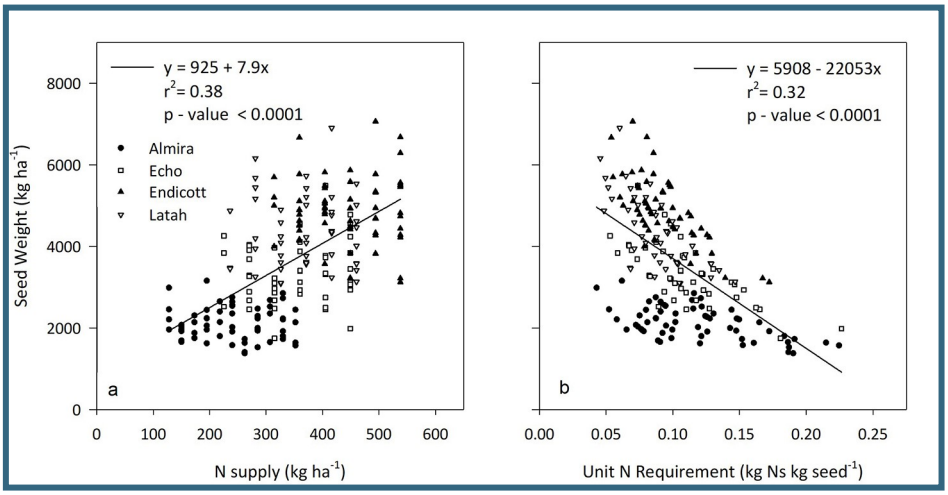

Figure 1. Seed weight in relation to (a) N supply (fall residual N + spring fertilizer N + mineralized N) (b) unit N requirement (N supply/ seed weight) at 2017-18 winter canola sites .

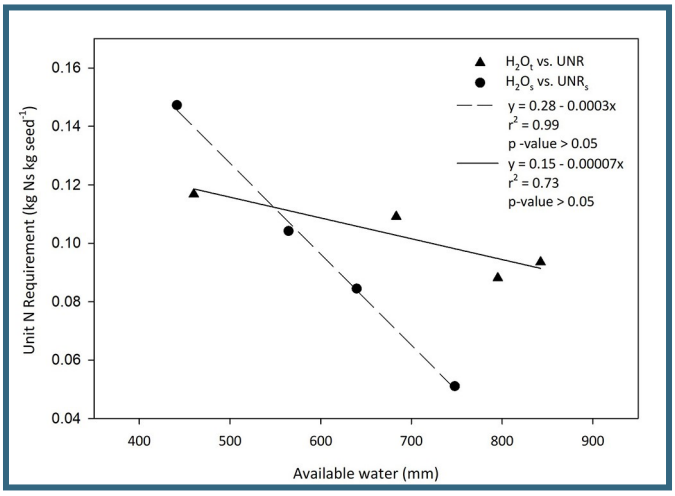

Figure 2. Mean fall and spring unit nitrogen requirements (Ns/Gw; Nss/ Gw) in response to total available water (H_2Ot; fall soil water + total season precipitation) and spring available water (H_2Os; spring soil water + spring precipitation) for 2017-18 winter canola sites. Data points represent averages across different nitrogen treatments across sites.