Spring cultivar yields ranged from 1,125 to 1,838 lbs. per acre when averaged across the seven dryland sites. (Hermiston was excluded from the means because of not all varieties were grown at that site.) Mean seed yield by site ranged from 800 lbs. per acre to 2,479 lbs. per acre, with an overall mean of 1,512 lbs. per acre. The five cultivars with highest yields were 'HyCLASS 930 RR', 'NCC 101S', 'HyCLASS 955 RR', 'DKL 71-14BL RR', and 'DynaGro 200 CL'. The trials at several sites, including Bonners Ferry, Moscow, and Fairfield, yielded less than expected due to delayed seeding caused by wet weather during the optimum seeding window.

Detailed reports with data tables are available at: *http://www.cals.uidaho.edu/brassica/.*

Ongoing Experiments to Protect Canola Seedlings from Horned Lark Depredation

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Horned lark (*Eremophilia alperestis* L.) depredation of pre-emerged and newly-emerged canola seedlings is an increasing concern for both dryland and irrigated farmers in the Inland PNW. Horned lark (Fig. 1) is a native bird species throughout Canada, the United States, and most of Mexico. They are permanent year-round residents of the PNW.

The first report of horned lark damage to canola was at Lind in 2006 where they destroyed a 0.25-acre winter canola experiment. The geographic range of their canola seedling depredation has since extended into Adams, Grant, Douglas, Lincoln, and Spokane Counties. Some canola farmers have recurrent problems with this bird whereas neighboring canola farmers have never been affected. There are two documented cases at separate locations in Adams County where entire 125-acre irrigated circles of both winter and spring canola were destroyed by horned larks.

Figure 1. The Horned Lark is a ground-dwelling bird commonly found in open areas and in fallow fields throughout North America. Photo by Terry Sohl (with permission).

Many attempts have been made to control horned lark feeding on canola seedlings. These have included loud propane-powered noise cannons, placement of glittery flags and reflecting 'disco balls' in the field, mixing garlic powder with the canola seed before planting, and laser lights. These control strategies have not been effective. The most effective control method tried to date was by an Adams County farmer who hired a falconer from the Tri-Cities to have several of these predator birds fly over his fields for several days when canola seedlings were emerging. This, obviously, is a very expensive control method.

We have a new experiment underway at Lind and Ritzville in 2018 for both spring and winter canola. A nontoxic seed treatment called Avipel™, registered and marketed by Arkion Life Sciences in Delaware, is widely used to effectively control black bird and crow damage to corn and rice seed. The active ingredient in Avipel is anthraquinone, and organic chemical that occurs naturally in dozens of plant species. Avipel imparts a bitter taste to the corn seed. However, horned larks do not eat the canola seed but rather the cotyledon leaves of the emerging seedling. We need the seed treatment to act 'systemically' or, in other words, get inside the canola plant tissue to impart a bitter taste in the coleoptile leaves. Dr. Ballinger feels he may have developed a means to do this and has treated some spring canola seed that we sent him. Replicated field experiments with and without seed treatment will be established both this spring (April) and in late August for winter canola.

Horned larks are a native species and are protected by law. Our purpose is not to harm horn larks but rather to deter them. Avipel is a non-toxic bird repellent, not a bird poison. We are following EPA and FDA rules. We will send replicated samples of harvested canola seed for laboratory analysis to ensure there are no traces of the seed treatment in the harvested seed.

Improving Nitrogen Use Efficiency for Winter Canola Using 4R Stewardship

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Winter canola has potential as an alternative cash crop to wheat. Canola also has tremendous rotational benefits for soil health, weed and disease control, and the subsequent wheat crop. Careful fertility management is important to ensure maximum yield and quality; however, fertility management research specifically for winter canola production is limited. In fall 2016, three nitrogen (N) fertility trials were started to investigate the optimum rate and timing of N-fertilizer application for winter canola. Trials were established in three areas that represent different yield potentials, soil types, crop rotations, and climatic conditions. Two dryland trials were located near the towns of St. John and Hartline in Washington and one irrigated trial located near Odessa, WA. The primary objectives are to learn N uptake during the growing season, to estimate optimum rate and the best timing for N application for canola grown in different environment with different yield potentials, and to evaluate how N affects canola yield and oil content. In the 2016-2017 trial, there were no statistically significant differences in yield or total above ground biomass among N treatments. Lack of yield response to N may be due to high variability in plant counts within plots and high soil residual N at planting. Above ground tissue N increased at all growth stages with increased N rate. Split and spring-only N application resulted in greater above ground tissue N when compared with fall-only application. Seed oil and protein content were found to be inversely related, with higher N rate contributing to higher protein content and lower oil content. The second year of trials is underway, with dryland sites in Colfax, WA; Latah, WA; Troy, ID; and one irrigated site in Echo, OR.

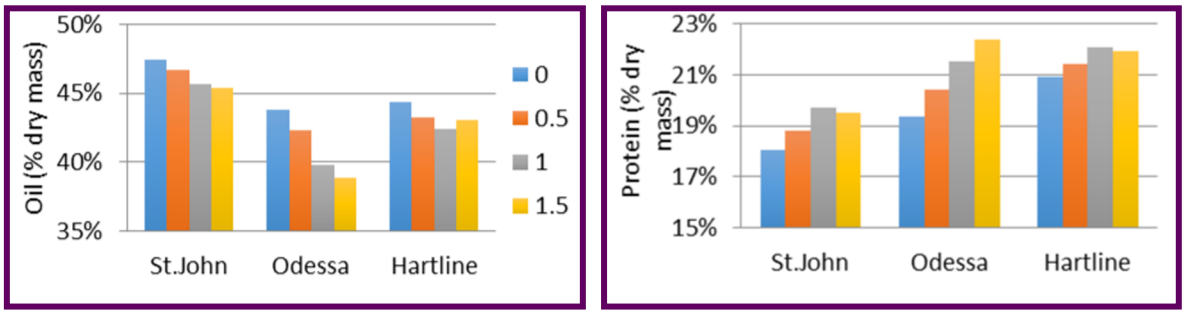

Figure 1. Seed oil and protein content as affected by N application. 0 indicates no N applied, 1 indicates full recommended rate based on Koenig et al., 2011. 0.5 and 1.5 represent 50% and 150%, respectively, of recommended N rate. Grouping is by field location.

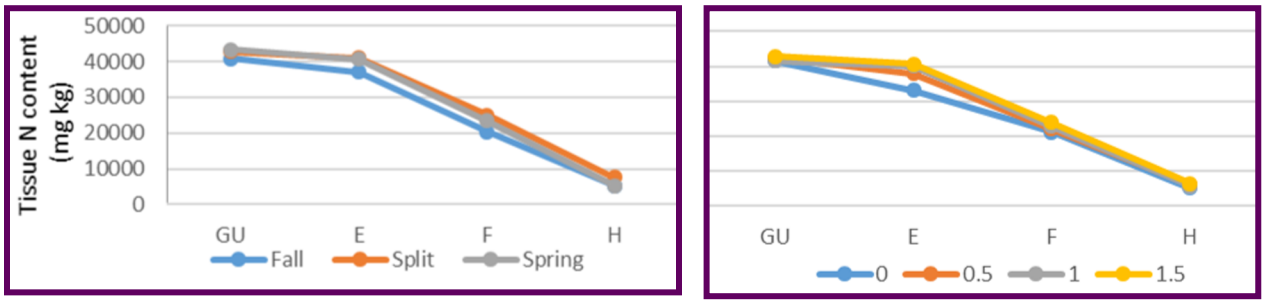

Figure 2. Above-ground tissue N content (mg kg-1) at Greenup (GU), Elongation (E), Flowering, and Harvest (H) as affected by N application timing (A) and rate (B) in St. John, WA in 2016-17.