PLOT TO FIELD: APG CONTINUES TO LEAD FIELD SCALE RESEARCH IN ALBERTA

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Plot to Field, the field-scale research program launched in 2017 by Alberta Pulse Growers, is in full swing this year. This program has several goals, one of which is testing small plot learnings on large, farm-scale plots across the province to ensure appropriate application of outcomes. Second to this, some things are challenging to assess on small plots, variability across landscapes, logistical and practical considerations, are some of the motivators behind testing applied and basic research questions on a field scale.

This year, APG has two sets of trials, one focused on pea and the second on lentils. These are the two dominant pulse crops for the province. The Plot to Field program operates as a team with two PhD staff, four agronomists and 15 farmers. Planning and execution is done collaboratively to ensure that the outcomes are directly relevant to the farm, address a true management issue and provide both individual as well as provincial recommendations.

Scientists from various institutions are invited to add research projects on top of the base treatments. In this way the value of the program is elevated significantly. For 2022, we are pleased to have all original cooperating producers returning and to welcome a great new set of participants primarily for lentil trials. This program's sites span from northwest Alberta to near Edmonton, to the southern most site minutes from US border.

Trial 1 Intercropping Pea and Canola (2022 – 2025)

Intercropping has recently garnered much attention. There have been a number of small plot trials across the prairies that have examined a variety of management practices related to growing intercrops. While not suitable for every farm business, the practice of intercropping may be advantageous in certain locations and situations. The challenge of developing management practices when planting two or more species is that small plots rarely reflect the complexity of the field. For this reason, the Plot to Field team developed research questions and protocols to gain more solid best management practice (BMP) recommendations.

The peola (Pea + Canola) intercropping trial is located at eight sites across the province. For this trial, determining parameters around fertility is the focus. The main research question for peola intercropping is if 50% of nitrogen fertilizer must be applied into a peola crop for greatest Land Equivalent Ratio (LER). LER is defined as relative landmass required under mono-cropping to produce the same yield as in the case of intercropping. This led to four treatments i.e. full rate (8 plants/ft) monoculture pea with no fertilizer applied, full rate (8 plants/ft) monoculture canola with recommended rate, intercrop with 75% pea and 50% canola with no fertilizer applied and an intercrop of 75% pea and 50% canola with 50% recommended rate. The recommended rates were based on 50 bu/ac yield in central and south Alberta and 60 bu/ac yield of pea in northern Alberta.

The peola sites have all experienced a variety of conditions that have led to several opportunities for learning. Relative maturity of the canola has been delayed at several locations due to land rolling, a common BMP for pea crops. Variability in amount and timing of rainfall has impacted the health of peas at some sites due to the onset of root diseases. Our sites were not immune to the hailstorms that many locations across Alberta experienced this summer.

Root rot took its toll on some sites as well. Two sites had high lygus pressure and needed chemical control.

Data is being collected from this trial in addition to pea and canola yields. We are looking at seeding date, moisture conditions, inoculant type and rate, pea seed variety, emergence date, plant counts, nodulation, relative control of weeds in intercrop versus monocultures, insect occurrence and damage, disease incidence, flower timing and maturity for both crops, and issues at harvesting. Other visual observations such as canopy closure, overall health, and learnings such as rolling the peas and its effects will be recorded. We are excited to see how results from this study pan out as this will be first of its kind field-scale trials in Alberta, testing for viability of peola intercrop.

JP Pettyjohn, Plot to Field agronomist for the north, and Shawn Kahlon, son of APG Research Officer Dr. Jagroop Gill Kahlon, recorded observations at pea canola intercrop trial close to Stony Plain, AB in the first week of August 2022.

Pea and canola intercrop site suffering from hail damage and suspected Aphanomyces close to Linden, AB in July 2022.

Lomond, AB site being seeded to lentils in May 2022.

Seeding Rate of Lentils (2022 – 2025)

Recommended seeding rates for lentil are based on data that is several years old and much has changed in agricultural practices since that time. We are excited to be able to expand our Plot to Field initiative to include lentils. The current recommendations of Alberta Agriculture, Forestry and Rural Economic Development for seeding rate in Alberta are 120 plants/m² for small red lentils (source: *Red Lentil Management in Alberta. Alberta Agriculture and Forestry. March 2020*). Recent research out of Saskatchewan has suggested that small red lentils could benefit in yield and profitability by increasing from the current recommended rate of 120/m² to as high as 240/m² (source: *Shirtliffe, S. The Effect of Seeding Rate and Seed Size on Lentil Diseases, Weeds, Yields and Profitability. Growing Forward 2 Pulse Science Cluster Project AIP-CL03 annual report 2017*).

Based on this, Alberta Pulse Growers' Plot to Field team developed protocols for testing the currently recommended seeding rate against higher seeding rates to determine which practice will maximize yield. This trial is being run at seven locations in southern Alberta. We aim to identify the impact of increasing seeding rate on yield, disease pressure, weed suppression and net returns. Our research question for this trial was recommended rate of 120 plants/m² yields compared to a higher and much higher rate of 160 and 200 plants/m² yield. Data collection includes soil sampling, fall or early spring, seeding rate based on target plant density (adjusted for total known weight, germination and 4% mortality), soil temperature at 2-inch depth at time of planting, soil profile moisture at planting (estimated with hand feel method, 6-inch increments), soil planting depth (aim for 2.5 to 4 cm), rainfall, stand density one month after planting, timing for flowering and physiological maturity, nodule assessment, root disease assessment, other foliar disease assessments, pods per plant, standability at physiological maturity and yield. Variability in weather this season has impacted sites, timing and volume of precipitation has resulted in some root disease at one site, hail decimated another site. The success of the Plot to Field program is a direct result of having a team committed to delivering high quality data. We look forward to the results of these two projects, and to support continued growth of the pulse industry in Alberta.

Taber, AB lentil site for Plot to Field shows suspected Aphanomyces infection.