

Appendix A

Recommended Research Priorities for Pulse Projects under the Agri-Science Cluster Program

| Focus Area | Pulse Crop | Research Priority | Industry Funders |
|----------------------------|---------------------------------|---|-----------------------------------|
| Genetic Improvement | Pea, Lentil and Chickpea | Nutritional biofortification – to develop pulses that are high in targeted nutrients such as selenium, iron, zinc, folate and carotenoids | SPG, APG |
| | Pea | Expanded trialing of genetic material into broader Agri-climatic zones (i.e. develop specific varieties for black, thin black, and brown soil zones) | SPG, APG |
| | | Improved Yield and Yield Stability – including breeding for: Drought tolerance/ water use efficiency; Nutrient use efficiency; Tolerance to heat at flowering | APG, MPGA |
| | | Disease resistance (foliar - Ascochyta, Downy Mildew and new sources of resistance for Powdery Mildew; fusarium foot rot – especially in long term pea growing areas) | APG, MPGA |
| | | Improved plant architecture & lodging resistance | APG |
| | | Increased crop competitiveness and herbicide tolerance | APG |
| | | Increased nitrogen fixation | APG |
| | | Pea Inoculants – select Rhizobia bacteria with cold/ drought tolerance | APG |
| | | Processing quality - Consistency in form and function of the seed for each market class | APG |
| | | Improve Market traits – seed size; seed shape; seed coat color | APG |
| | | Increasing the feed value of peas | MPGA |
| | | Chickpea | Ascochyta resistance for Kabuli's |
| | Faba Bean | Expanded trialing of genetic material into broader Agri-climatic zones (i.e. develop specific varieties for high rainfall and irrigated areas) | SPG, APG |
| | | Increase yield, yield stability, seed size/shape | APG |

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|---|------------------------------|--|------------------|
| <i>Agronomy and Sustainable Production</i> | Pea, Lentil, Chickpea | Improving plant nutrition through mycorrhizae and beneficial endophytic associations | SPG, APG |
| | Pea | Research contributing to the minor use registration of herbicides, fungicides, and pesticides (for insect pests). Including alternatives to Edge/Treflan and other herbicide technology options | |
| | | Efficacy/Resistance and the economics of fungicide applications (Pathogen forecasting & modeling - models or scoring systems to determine the probability of success with a fungicide application), including epidemiology of diseases, effects of herbicide stress and disease susceptibility in the black soil zone, and the efficacy of seed treatments across soil zones | SPG, APG |
| | | Herbicide efficacy and management options for resistant weeds (especially Group II resistant weeds) | SPG, APG |
| | | Disease control & management strategies – for Ascochyta; Downy Mildew; fusarium foot rot – especially in long term pea growing areas | APG |
| | | Disease survey | APG |
| | | Sustainability of Pea in Canola Rotation in black soil zone – what is the impact of the preceding canola crop on pea performance? | SPG |
| | | Determine the optimum frequency and sequence of pea crop rotations, including the impact on soil biotic and abiotic in different agro-climatic zones | SPG, APG |
| | | Long term rotational benefits in all pea growing soil zones (including: disease development, soil carbon, increased water use efficiency, nitrogen fixation and management, pesticide impacts, Increased nutrient use efficiency, economics of pulse crops in rotations) could be in the form of a surveying/ sampling long term pea producer fields | APG |
| | | Optimize pulse rotational LCA | APG |
| | | Pre-harvest treatments (Roundup) | APG |
| | | Market specific agronomy – no specific trials, but in other research priorities listed in agronomy and sustainable production, consider including both green and yellow varieties | APG |

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|---|---|---|--|
| <i>Agronomy and Sustainable Production</i> | Lentil | Research contributing to the minor use registration of herbicides, fungicides, and pesticides (for insect pests) | SPG, APG |
| | | Interaction between herbicide stress and disease susceptibility in lentil | SPG, APG |
| | | Efficacy of seed treatments across different soil zones | SPG, APG |
| | | Improving weed control in lentil - herbicide and management options for resistant weeds, especially to Group 2 herbicides | SPG, APG |
| | | Nitrogen management in red lentil – why are producers applying N fertilizer to red lentil? | SPG, APG |
| | | Integrated management of row spacing, plant populations and pests (weeds and diseases) | SPG, APG |
| | | Improving lentil performance in the cropping system: the optimum frequency and sequence of lentil in crop rotations | SPG, APG |
| | | Development of a biocontrol for grasshopper control in lentil | SPG, APG |
| | | Optimizing pre-harvest management practices (desiccation, Reglone alternatives, swathings) | SPG, APG |
| | | Chickpea | Research contributing to the minor use registration of herbicides and fungicides |
| | Enhancing chickpea disease management – continuing the Ascochyta sentinel project (additional 3 years) | | SPG, APG |
| | Improving broad leaf weed control (managing group 2 resistance and testing alternative products) | | SPG, APG |
| | Impact of frequency of rotation and management practices on the cropping system and soil carbon balance | | SPG, APG |
| | Faba Bean | Minor use research and registration of herbicides (broad leaf and grassy), and fungicides | SPG, APG |
| | | Determining the N fixation benefits of new faba bean varieties in cropping systems | SPG |
| | | Impact and control of root rot in faba bean | MPGA |
| | | Minor use research and registration of inoculants | APG |

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|-----------------------------------|----------------------------|--|------------------|
| Processing and Utilization | Lentil and Chickpea | Development of consumer-ready products including snacks and ready-to-serve meals. Proposal must include a commercial partner to be eligible | SPG |
| | | Evaluate the health benefits of lentil and chickpea consumption to First Nation peoples | SPG |
| | Lentil | Evaluating the prebiotic effects of different lentil food forms | SPG |
| | Faba Bean | Determination of flavour profiles of low tannin varieties in select foods | SPG, APG |
| | Pea | Development of food products containing pea fractions. Proposal must include a commercial partner to be eligible | APG |
| | | Develop solutions for the flavour concerns of food products containing pea fractions. Proposal must include a commercial partner to be eligible | APG |