



Research Priorities
Updated February 8, 2022

Current and past Alberta Wheat Commission (AWC) directors and regional representatives provided input on AWC’s research priorities, current investments and future needs to help direct the investment of producer dollars in future research initiatives. This process outlined overall research priorities, but also areas where AWC is under invested and where investments in research capacity are needed.

Between 2013 and 2021, AWC invested \$31.5M in breeding (general and for disease resistance), agronomy and processing (Table 1). The significant investments in breeding may seem unbalanced at first glance. However, AWC levies increased on August 1, 2017 specifically to provide funding to core breeding agreements after the end of the Western Canadian Deduction. The high proportion of general breeding reflects investments in these core breeding agreements beginning on December 31, 2019. There was consensus that AWC’s total research budget is sufficient given other competing AWC priorities such as policy, market development and member communications.

Table 1. AWC’s Research Investments from 2013-2021.

Investment Category	AWC Funding	Per cent of AWC Research Investments
Agronomy	\$ 5,920,521.22	19%
Breeding for Disease	\$ 4,110,895.50	13%
General Breeding	\$ 21,227,328.32	67%
Processing	\$ 263,238.01	1%
Grand Total	\$ 31,521,983.05	100%

Below are AWC’s core research themes. These align with the [Wheat Initiative](#) and provide coordination with global wheat research. They are listed in order by priority.

1. **Increase wheat yield potential**
2. **Protecting the environment and increase the sustainability of wheat production**
3. **Protect yield potential**
4. **Ensuring supply of high quality, safe wheat**



This format for AWC’s research priorities is new. Some of AWC’s previous research priorities strongly reflected the previous growing season and may not reflect longer term research needs. In light of the overarching policy issues farmers are facing (i.e., potential mandates to reduce fertilizer use) and the ongoing climate variability (i.e. heat and drought stress of the 2021 growing season), it was felt that previous priorities such as grain drying impacts on grain quality and selection of varieties with enhanced mycorrhiza associations are not critical areas for investment.

Increased yield was a top priority for producers. Since yield is 50% genetic and 50% agronomy, both are important areas to invest in. However, it is also important to recognize that breeding research is more expensive to conduct relative to agronomy research. Producer’s indicated a desire to increase investments in agronomy; however, the limited research capacity in this area, specifically in applied soil fertility research capacity make this challenging. Addressing the agronomy research capacity issues are going to be important in delivering on these research priorities.

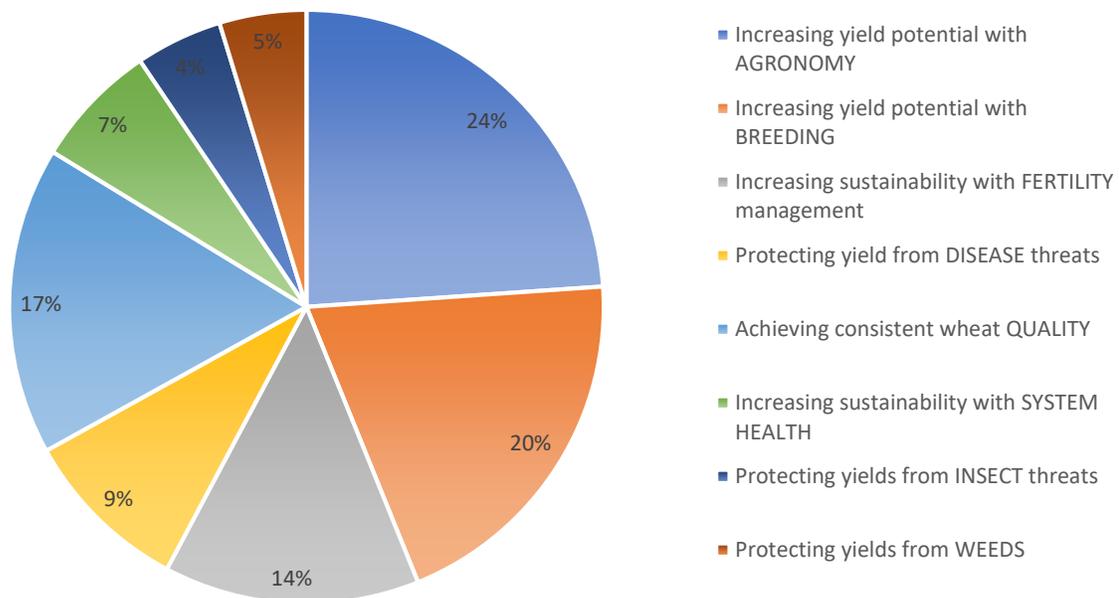


Figure 1. Research areas where producers wanted to see the highest dollar investments

Below are specific areas of research needed within each of these larger research themes. The percent denotes the relative importance of the research areas as rated by AWC’s directors and representatives. Only the top ranked specific areas are listed below.



1. Increasing yield potential with AGRONOMY

- a. Genetics x Environment x Management (GxExM)
- b. Seeding rates
- c. Plant Growth Regulators (PGRs)

2. Increasing yield potential with BREEDING

- a. Biotic stress resistance (i.e. disease resistance; insect resistance)
- b. Abiotic stress resistance (i.e. drought tolerance; frost tolerance)
- c. Increased yield

Note: Future research priority setting activities will have to determine the role that crop commissions play in variety development as government investments are being threatened and it is unclear if private industry will fill the gap.

3. Increasing sustainability with FERTILITY management

- a. 4R Management, N rates
- b. 4 R management, N placement to minimize N loss
- c. Phosphorous nutrient management

Note: Producers struggled to pick their top 3 priorities in this area as there were many areas of important work, however the top 3 priorities were noted as most critical. While variable rate and various fertility management technologies impact on-farm profitability, these were not seen as areas for AWC investment. Rather there maybe a role for producer funds to validate the profitability of this technology, but it is also a space where other groups, such as PAMI, are working and AWC does not want to duplicate efforts. There are also other groups such as Alberta innovates and RDAR who are funding in these areas.

4. Protecting yield from DISEASE threats

- a. Decision making tools
- b. Fungicide management
- c. Fusarium management
- d. Disease forecasting systems

Note: Fusarium was noted as the top disease of concern

5. Achieving consistent wheat QUALITY

- a. Achieving consistent protein with breeding and agronomy
- b. Achieving and functionality (reduce sprouting) with breeding and agronomy

Note: Wheat quality and functionality characteristics must align with market demand. The objective is to enable farmers to consistently meet these quality (protein and functionality) goals without suffering a yield penalty. There may be different genetic and agronomic tools specific for different growing environments.



6. Increasing sustainability with SYSTEM HEALTH

- a. Crop rotations
- b. Maintaining and managing soil organic matter

Note: Maintaining soil organic matter is an outcome achieved with various management tools such as crop rotations, cover crops or intercrops. Things like intercrops and cover crops can be more easily implemented on mixed farms rather than grain only farms. An important consideration is to justify both the short and long term economics of these practices. It is also important to note the varying ability to increase soil organic matter, under long term no-till systems. For fields that have been under long-term no-till management the goal is to maintain soil organic matter levels; for fields with potential to increase soil organic matter, management would aim to increase soil organic matter on those fields.

7. Protecting yields from INSECT threats

- a. Decision making tools
- b. Wheat midge
- c. Short term forecasting tools i.e. risk maps

Note: Top insects of concern were: wheat midge and sawfly

8. Protecting yields from WEEDS

- a. Resistant weed management including kochia, wild oat, group 2 resistant weeds
- b. Pre-harvest herbicide alternatives
- c. Strategies to increase crop competitiveness (may include breeding)

Note: top weeds of concern were: resistant wild oats, cleavers and foxtail barley

Disclaimer

It is worthwhile to note, that like all things, there is bias in these priorities. This can come from the geographic distribution of directors and regional representatives, the type of operations they run (i.e. grain only vs mixed farms), and the current policy issues of the day. AWC staff will use these priorities as a guideline when working with scientists to develop research proposals, but it not an exclusive list. There is always room for investment in the next 'blue sky' idea or other area of research as new production and policy threats evolve.