

Wheat is an important rotational crop and a major contributor to the Saskatchewan economy. Most wheat acres are seeded into high protein milling classes such as CWRS and CWAD. Provided that top grades and protein can be achieved along with high yields, wheat can also be quite profitable; however, consistently achieving both yield and quality while also managing input costs is a challenge. The objective of this project was to demonstrate the agronomic and economic responses of CWRS wheat to numerous crop inputs individually and in various combinations. A field demonstration with CWRS wheat was conducted at Indian Head in 2019 and 2020. The project was designed to show the contributions of individual crop inputs when either added to low input systems or removed from high input systems. The inputs that were varied included seed-applied fungicide, seeding rate (250 vs 400 seeds/m²), fertility, plant growth regulator (PGR), and foliar fungicide.

Increasing seeding rate had the greatest effect on plant populations while seed treatments had a slight positive effect in 2019 but not 2020. Plant height was primarily affected by the PGR which reduced height by 7% on average. Lodging was always negligible under the dry conditions. Fusarium head blight (FHB) pressure was low

and the only input to consistently affect FHB incidence was foliar fungicide, but higher seeding rates also reduced infection in 2020. Yields were lower in 2019 compared to 2020 and there was also greater separation between treatments in 2020 (Figure 1). For example, there was a 7% yield advantage to the high input treatment over the low input treatment in 2019 compared to 18% in 2020. Extra fertility was the input that consistently increased yield, resulting in an average yield increase of 8% compared to 5% for foliar fungicide and 2.5% for PGR. Seed treatments and higher seeding rates did not increase yield. Impacts on test weight were small and of little agronomic importance while seed weight was not affected. Extra fertility was the only input that increased grain protein, from 13.7% to 14.7% when averaged across years. Fungicide slightly reduced protein due to its positive effect on yield. Basic economic analyses showed the most intensively managed wheat to be less profitable than the low input package, but results varied depending on the specific inputs and the growing season.

Products such as seeds and fertilizers are generally known to build yield potential while crop protection products and PGRs are for protecting yield potential and preventing losses due to factors such as disease or lodging. With that

in mind, it makes sense that products intended to prevent yield loss often provide the greatest benefit when combined with adequate levels of the inputs that build yield potential up in the first place. As a general recommendation, soil testing to determine fertility requirements and choosing crop protection products based on knowledge of past pest problems combined with frequent crop scouting will provide the best opportunity to optimize yields and quality while managing costs and maximizing economic returns.

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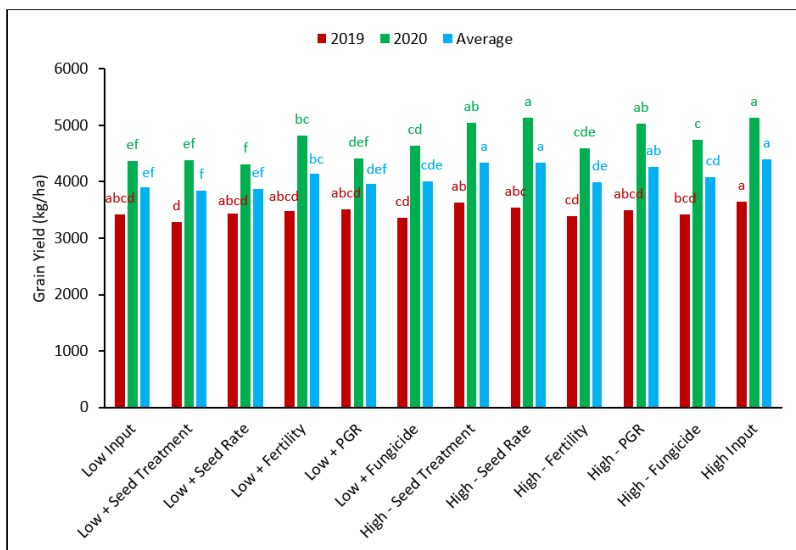


Figure 1. Mean spring wheat grain yields for individual years and averaged across years. Means within a year followed by the same letter do not significantly differ.