Crown Rust in Oats: When Are Fungicide Applications to Control Crown Rust of Economic Benefit to Producers

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Introduction

Prophylactic fungicide applications are increasingly being recommended to oat growers. Reports coming out of Manitoba suggest yeild response in oats to fungicides in the absence of crown rust. Growers need to know if they are spending their money wisely. In this project we hope to provide growers, using current cultivars and agronomic practices, with better information on the timing and level of severity of crown rust infection on oats that warrant a fungicide application. The second objective is to provide growers with independent information on the benefits of a fungicide application on oats in the absence of crown rust in their geographic area and how it differs among regions in western Canada.divers as you move from region to another. To do this three agronomic practices were examined,seeding date (mid may and early june), cultivar (AC Morgan, CDC Orrin, CDC Boyer and Leggett) and fungicide use (Headline or no headline). The study was conducted at 6 locations betwee Portage le Priaire, MB to Saskatoon, SK every year for three years

Materials and Methods

Experimental Design: Split -Split plot

Main Plot Size: 35 ft x 13 ft
Reps: 4

1) Main plot: Seeding Date
- I) May 5 - 15
- II) June 1- 5

2) Split: Fungicide (applied at flag leaf)
- I) No Fungicde
- II) Fungicide (Headline)

3) Split-Split: Cultivar
- I) Very Susceptible to crown rust (AC Morgan)
- II) Susceptible to crown rust (CDC Orrin)
- III) Partially resistant to crown rust (CDC Boyer)
- IV) Cultivar with best possible resistance at time of trial (Leggett)

Location	Test Number
Indian Head	09-671
Brandon	09-672
Melfort	09-673
Saskatoon	09-674
Canora	09-675
Portage La Prairie	09-676

Target Plant density = 300 plants/m^2
Nitrogen = residual nitrogen + fertilizer = 80 kg/ha
P, K and S = 20,10,10 kg/ha

Preliminary Results and Discussion

Preliminary conclusions indicate that seeding date had the largest effect on yield and test weight. Benefits from fungicides appear to be related to the cultivars susceptibility to crown rust when crown rust is present. In this situation the yield of AC Morgan was increased by 18 bu/acre while the yield of Leggett was not affected. Under normal growing conditions benefits from fungicides have been limited and are not statistically significant in the absence of crown rust. Leggett which has the best crown rust resistance and tolerance of leaf diseases did not have an increase in yield or test weight from a fungicide application under any conditions. Test weight was only improved by a fungicide application when the cultivar was susceptible to crown rust and crown rust was present in the field. The data on yield and test weight is presented in several figures. This data is preliminary and may change with further analysis of the data.

Financial Support

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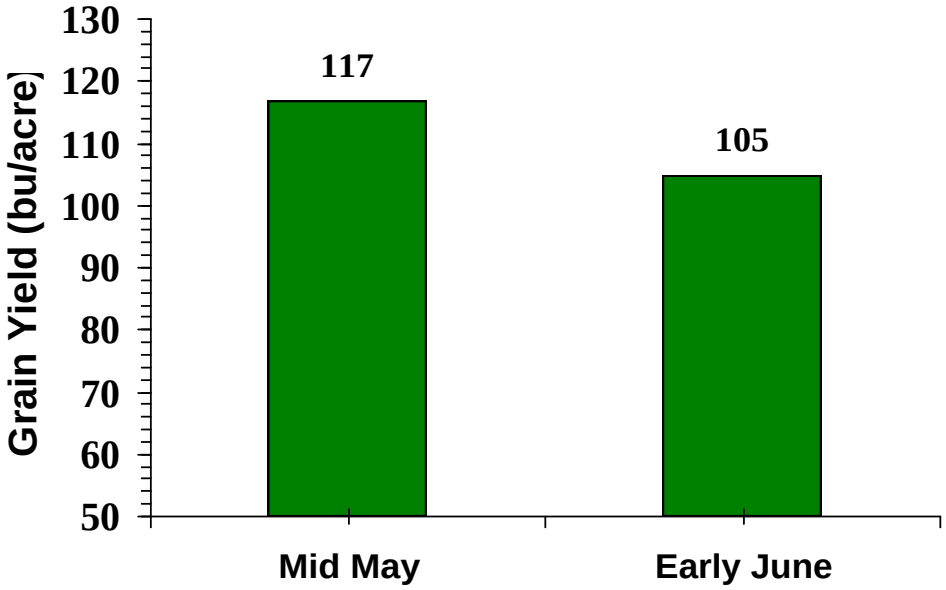
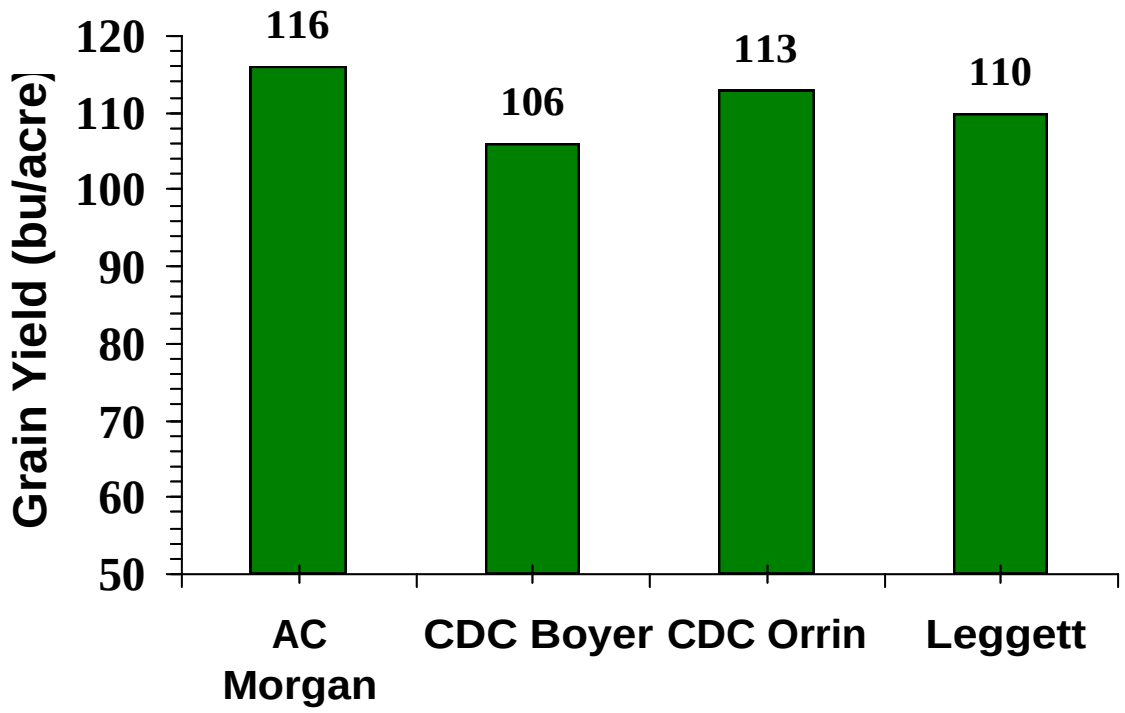
- **Can-Oat Milling**
- **Grain Millers**

Saskatchewan Ministry of Agriculture (ADF)

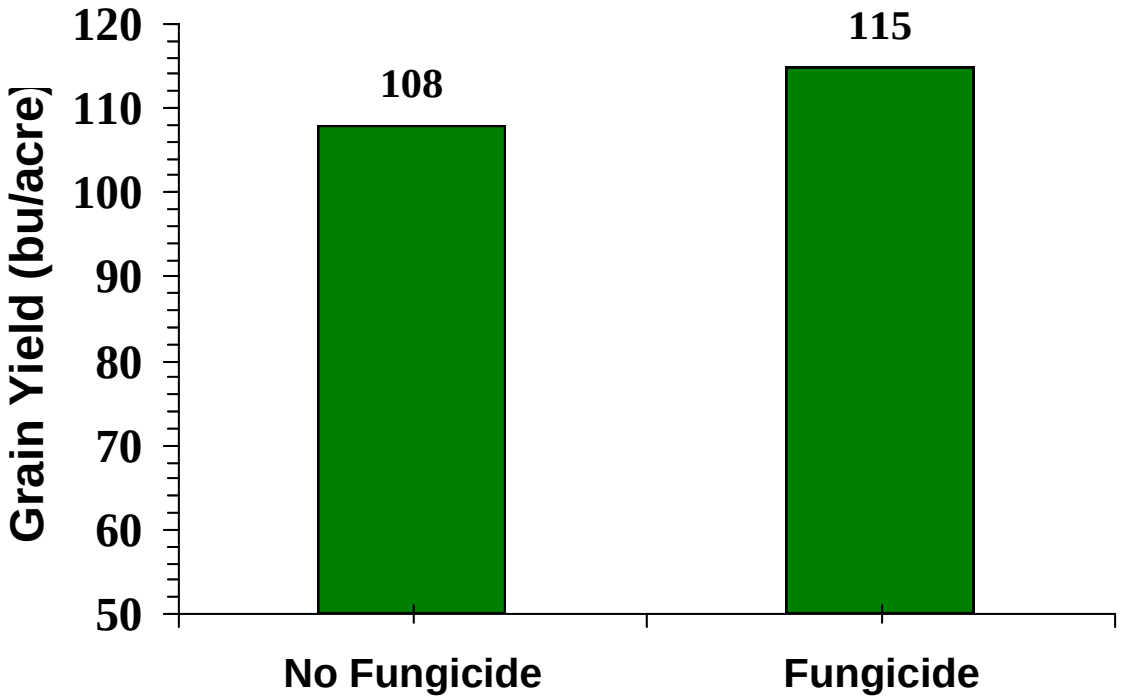
Seeding Date



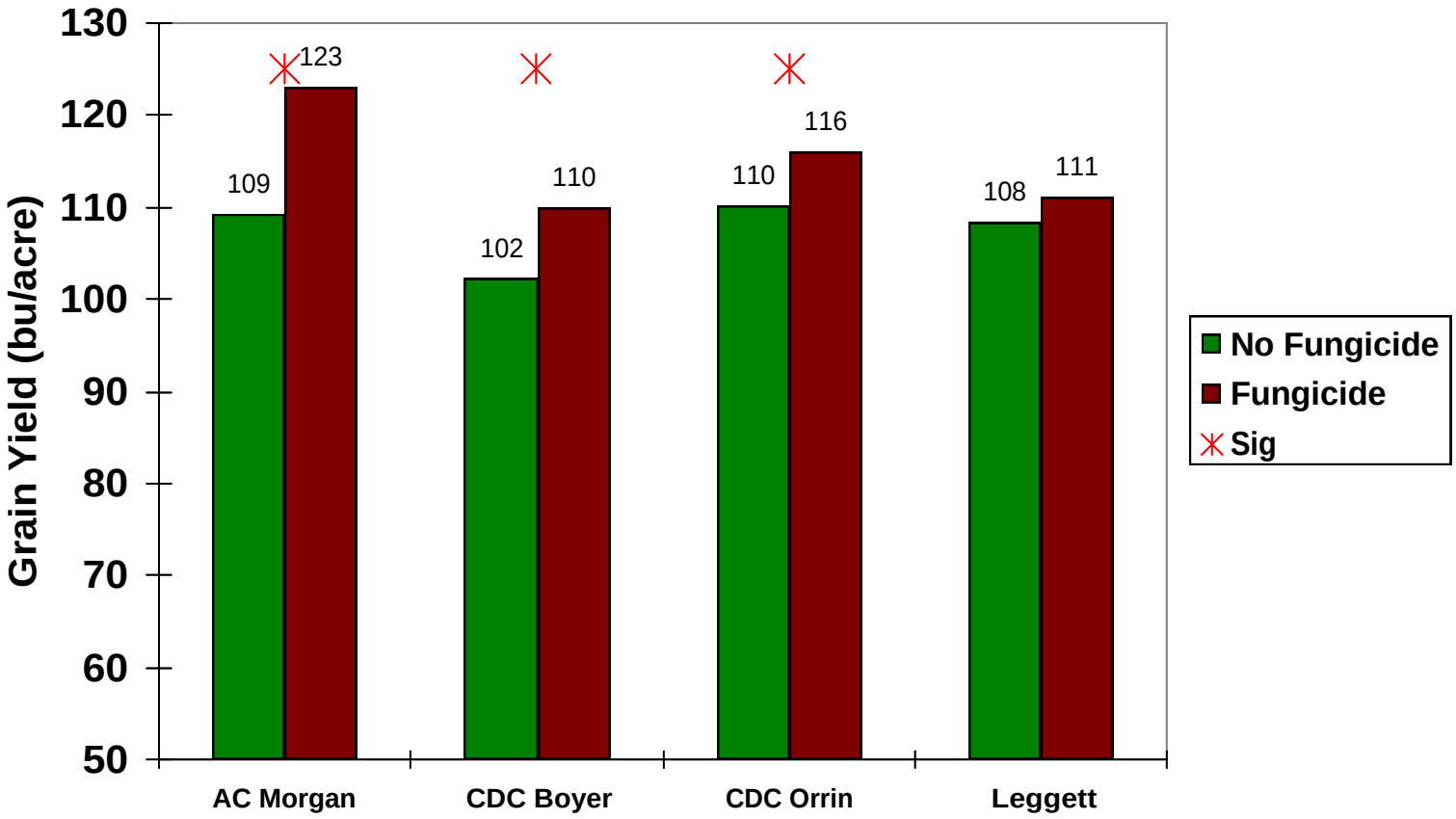
Cultivar


Grain Yield (bu/acre)
120
110
100
90
80
70
60
50
116
106
113
110
AC Morgan
CDC Boyer
CDC Orrin
Leggett

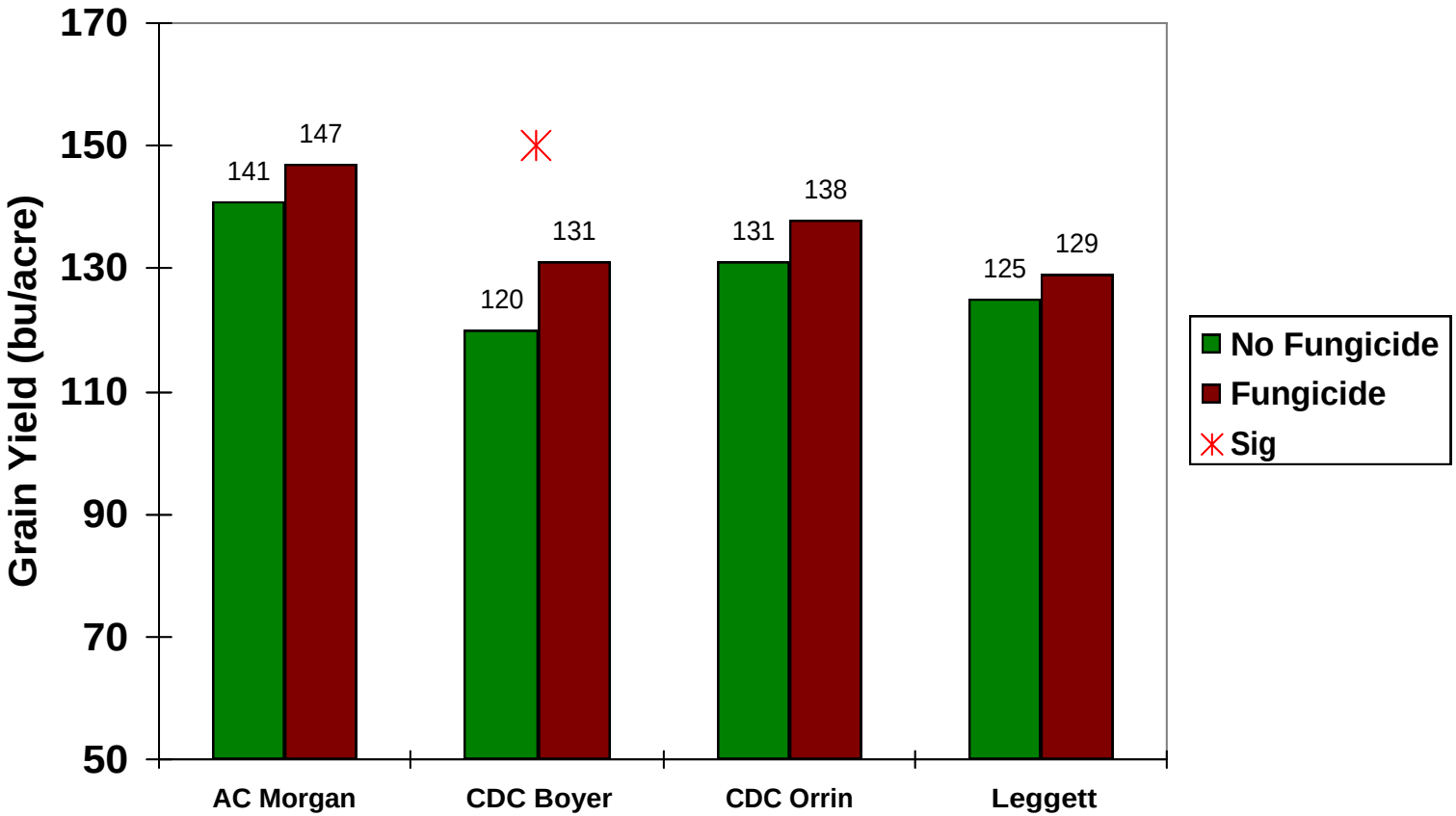
Fungicide


120
110
100
90
80
70
60
50
Grain Yield (bu/acre)
108
115
No Fungicide
Fungicide

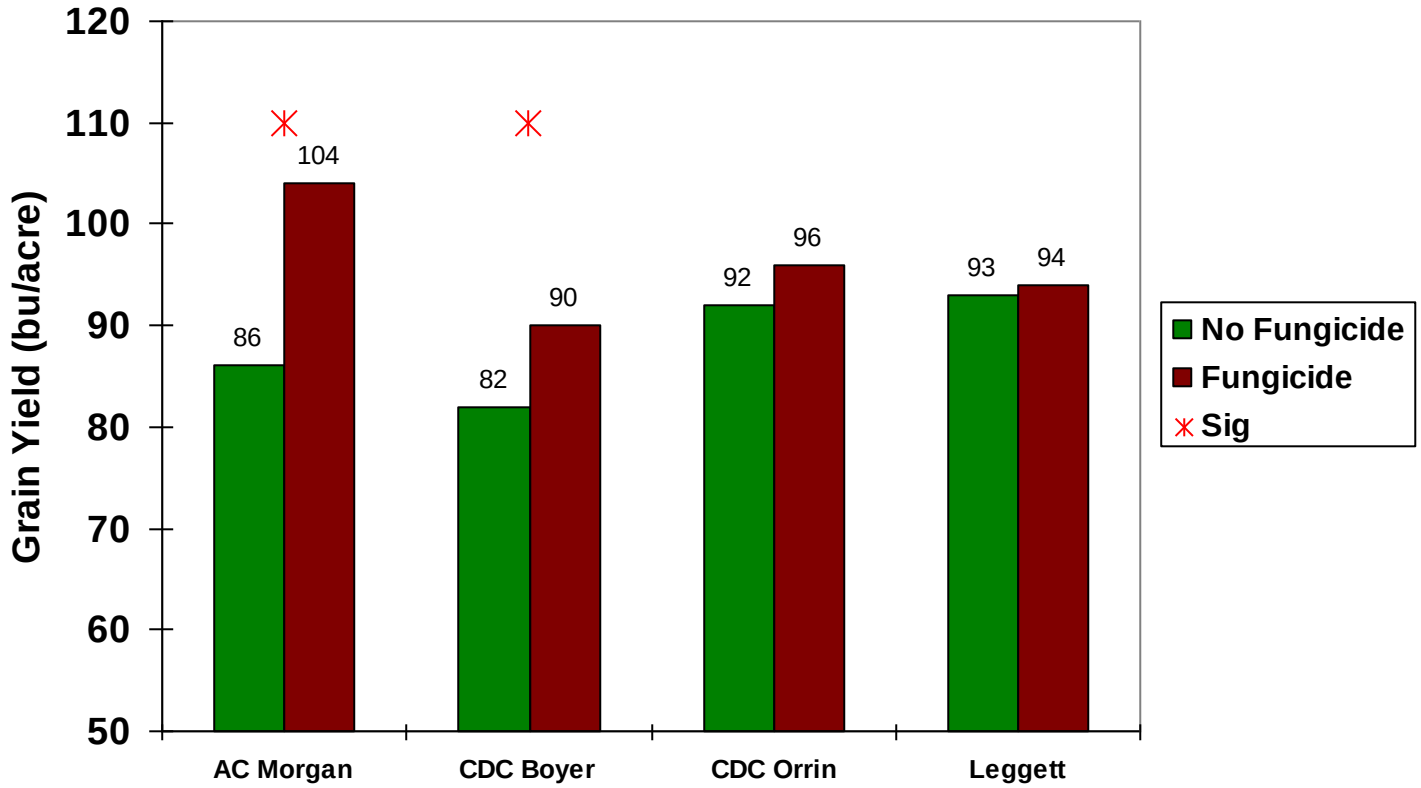
Cultivar


Grain Yield (bu/acre)
130
120
110
100
90
80
70
60
50
123
109
102
110
116
110
111
108
AC Morgan
CDC Boyer
CDC Orrin
Leggett
No Fungicide
Fungicide
Sig

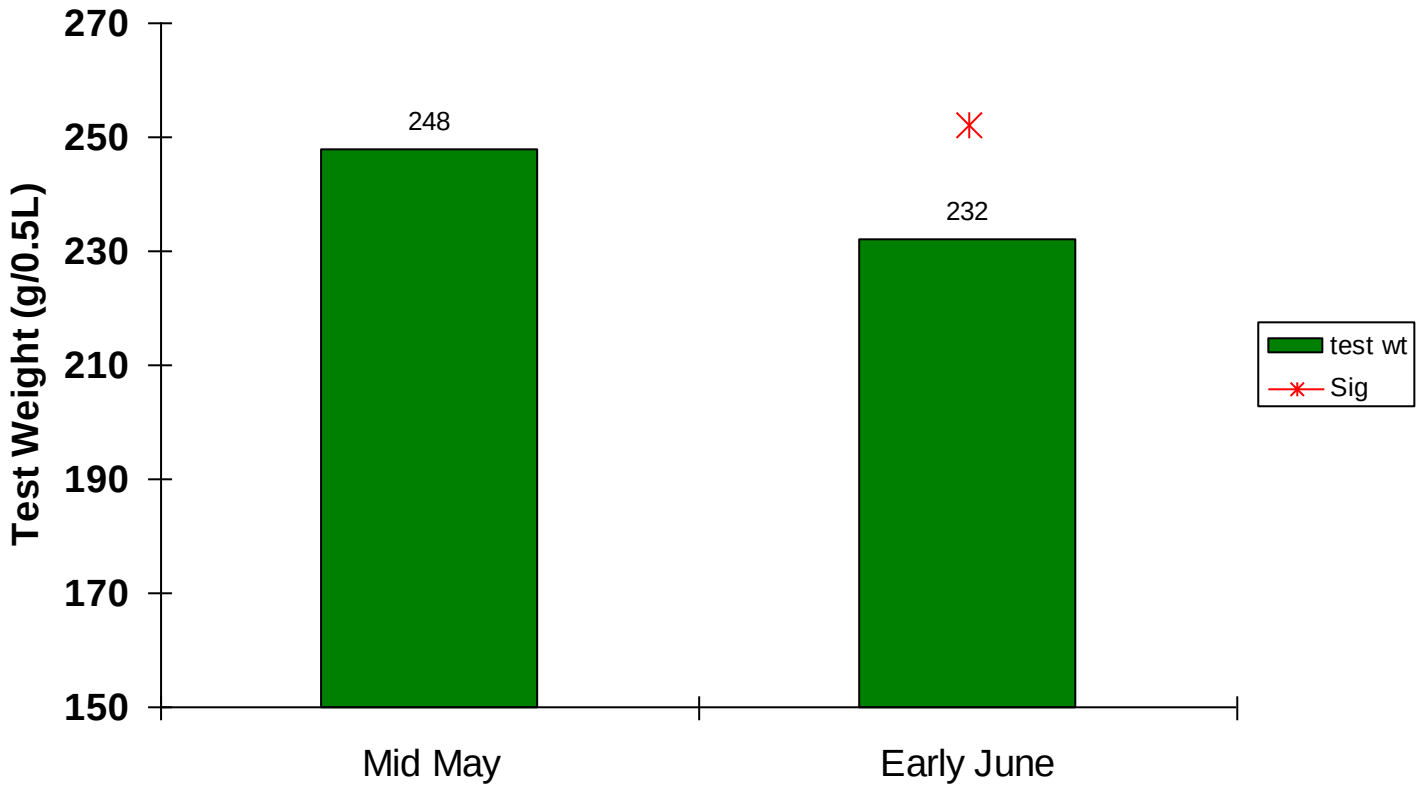
Sites with Low Crown Rust



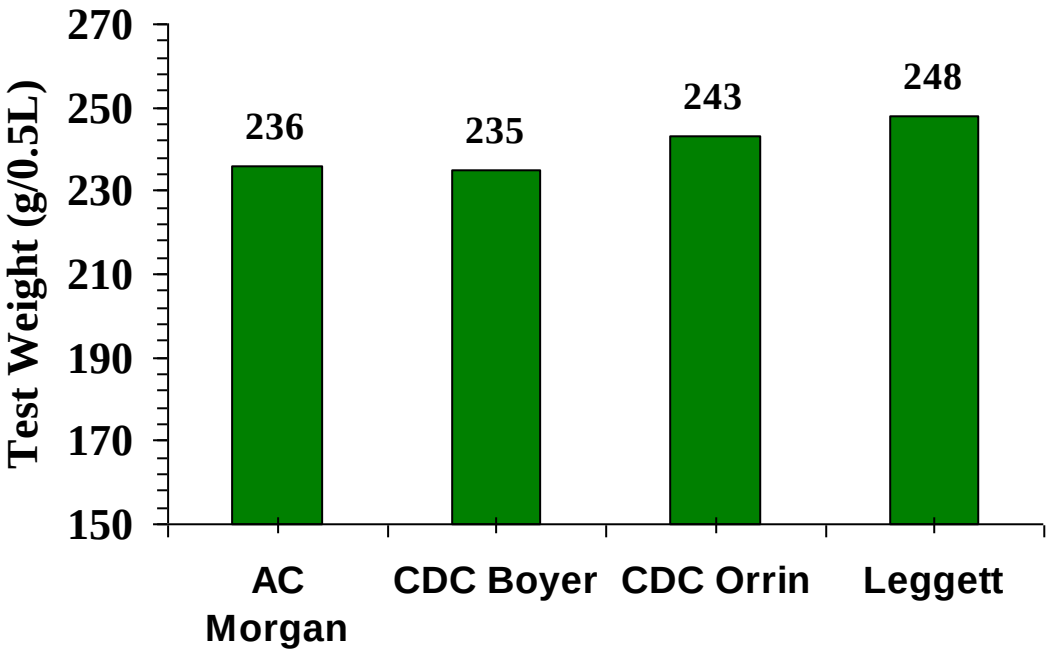
Sites with High Crown Rust



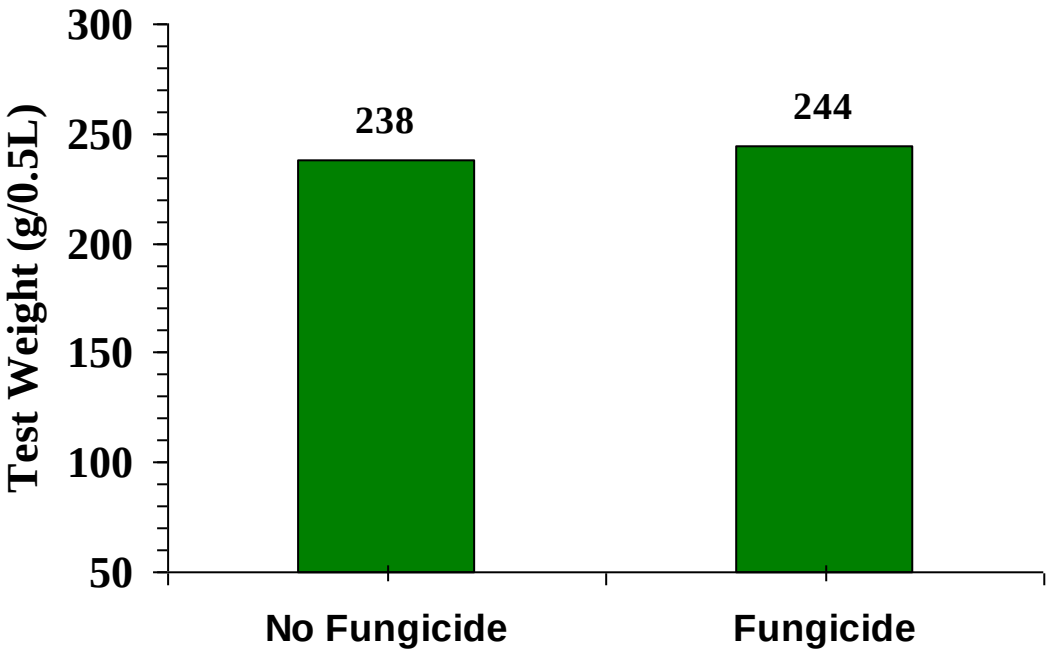
Seeding Date



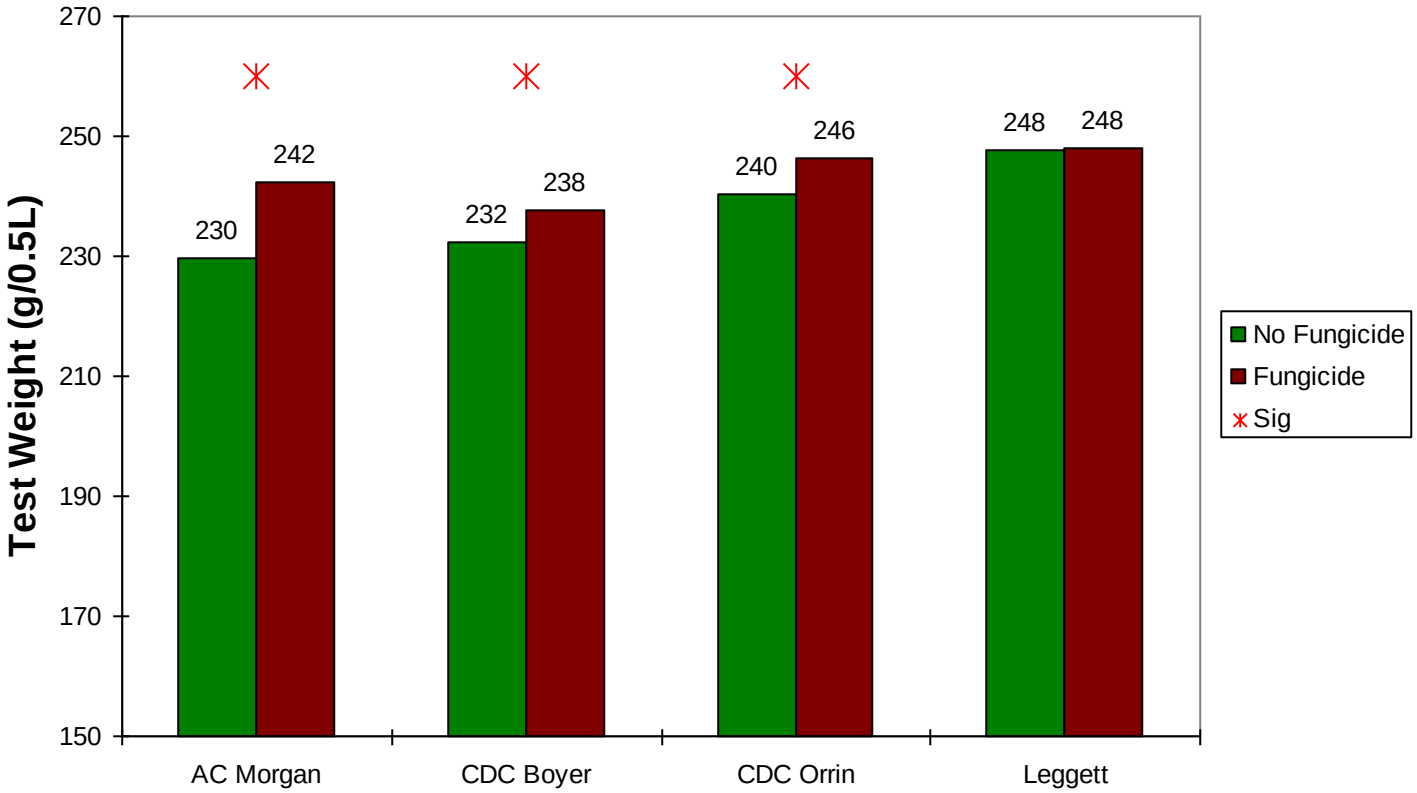
Cultivar


Test Weight (g/0.5L)
270
250
230
210
190
170
150
236
235
243
248
AC Morgan
CDC Boyer
CDC Orrin
Leggett

Fungicide


300
250
200
150
100
50
Test Weight (g/0.5L)
238
244
No Fungicide
Fungicide

Cultivar


Test Weight (g/0.5L)
270
250
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246
248
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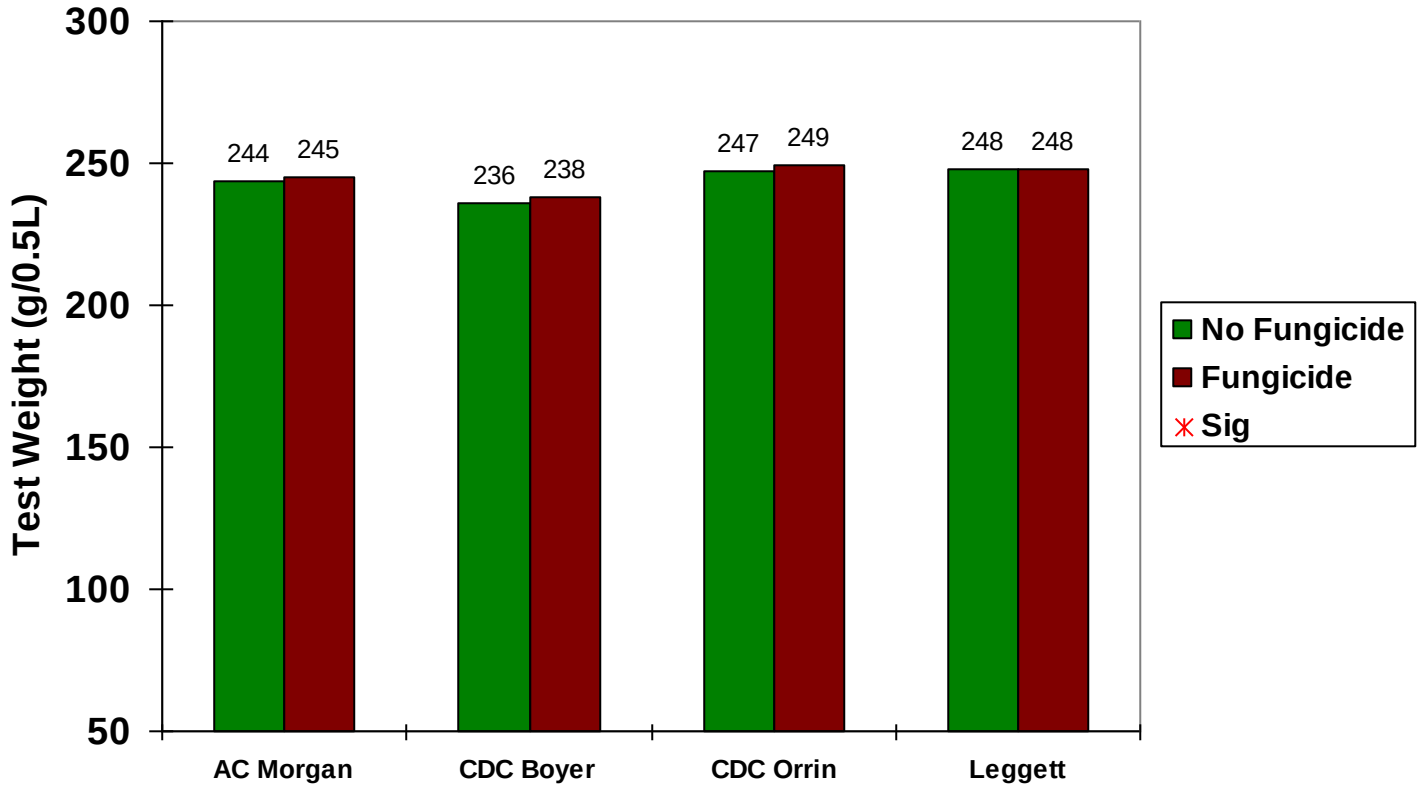
AC Morgan
CDC Boyer
CDC Orrin
Leggett
No Fungicide
Fungicide
Sig

Sites with Low Crown Rust



Sites with High Crown Rust