Managed Performance Trials for Winter Wheat and Spring Cereals

2010 Interim Report, February 25, 2011

David C. Hooker[1] and Peter Johnson[2]

[1]Assistant Professor, Department of Plant Agriculture, University of Guelph Ridgetown Campus, 120 Main St. E, Ridgetown, ON dhooker@ridgetownc.uoguelph.ca
[2]Provincial Cereal Specialist, Ontario Ministry of Agriculture, Food, and Rural Affairs, Stratford, ON peter.johnson@ontario.ca

A. Executive Summary

- The Ontario Cereal Crop Committee (OCCC) conducts variety performance trials to determine the genetic potential and adaptation of cereal varieties in the Province of Ontario. Many growers have adopted fungicides to achieve higher levels of management. Variety performance in these performance trials may change with the use of fungicides; growers need to base decisions of variety selection using data relevant to their practice. This project will determine the influence of fungicides on provincial variety rankings and performance of winter wheat, spring wheat, barley, and oat.

- In 2010, performance data were compared with and without fungicide applications in five OCCC Performance Trials for each of oat, barley, spring wheat, and winter wheat. In the fungicide-managed plots, one fungicide was applied at flag leaf in oat; two fungicides were applied in wheat and barley: one at weed control timing and another at heading.

- Preliminary results indicate value in variety performance comparisons between fungicide and untreated trials. Briefly, fungicides increased yield when averaged across all varieties at most locations for all crops. More importantly however, some varieties responded more to fungicide than others at most trial locations. For example, changes in yields with fungicide(s) varied by variety and trial location: from zero to 48% increase across winter wheat varieties and locations, zero to 68% in spring wheat, zero to 41% in barley, and zero to >300% in oat. In general, variety rankings did not change significantly in locations with inherently low disease pressure. Diseases were controlled on the most susceptible varieties; these varieties tended to have the highest response to fungicide. These trials will be repeated in 2011.

B. Introduction

- The Ontario Cereal Crop Committee (OCCC) conducts variety performance trials to determine the genetic potential and adaptation of cereal varieties in the Province of Ontario. OCCC Variety Performance Trials have been traditionally conducted in the absence of fungicides. However, as technology has developed, many growers have adopted fungicides as a part of their normal management practices, particularly in wheat. Recently in oat, a shift in crown rust race has overcome the genetic resistance of most varieties, which generates the need to evaluate oat varieties under fungicide

programs as well. The focus of this research will be to evaluate if the rankings of varieties change based on fungicide management. This is a three-year, comprehensive project that will determine whether performance trials in the future will need to be conducted with and without fungicides. This project will support the increased use of fungicides and nitrogen that growers have begun to investigate and employ on a broader basis.

C. Objective

- The main objective was to determine the influence of fungicides on provincial variety rankings and performance of winter wheat, spring wheat, barley, and oat.

D. Materials and Methods

Spring Wheat 2010

- Locations:
  - Palmerston (Area II and IV; E.Sparry) – 19 entries
  - St. Mary's (Area II & IV; M.Etienne) – 19 entries
  - Ottawa (Area III; H.Voldeng/X.Wang) – 27 entries
  - Winchester (Area III; C.Wightman) – 27 entries
  - New Liskeard (Area V & VI; J.Rowsell) – 27 entries
- Treatments
  - All 2010 Spring Wheat Entries with and without fungicide applications
  - Weed control on all plots on the same day before GS20 (i.e., before tillering)
    - Complete Infosheet for weed control
  - Strip plot design with 4 replications
    - Main: Entry
    - Strip: with and without fungicide applications
  - Two Fungicide Applications in the "Fungicide Treatment"
    - QUILT @ 750 mL ha^{-1} before Zadoks GS30 (i.e., before stem elongation) using flat-fan nozzles (medium droplets) at 200 L ha^{-1} (note: high volumes reduce drift on adjacent untreated plots; apply when risk for drift is low)
    - PROSARO 250 EC applied at 0.8 L ha^{-1} (note: no surfactant) using backward-forward nozzles or with TurboFlood Jet nozzles when the average growth stage is GS62-63 (i.e., approx flowering initiated or Day+2 to Day+3) http://www.omafra.gov.on.ca/english/crops/pub811/4additional.htm
- All plots rated as normal OCCC Protocol for variety assessment

Spring Barley 2010

- Locations:
  - Palmerston (Area II and IV; E.Sparry) – 30 entries
  - St. Mary's (Area II & IV; M.Etienne) – 30 entries
  - Ottawa (Area III; A. Choo/J. Lunney) – 34 entries
  - Winchester (Area III; C.Wightman) – 34 entries
  - New Liskeard (Area V & VI; J.Rowsell) – 24 entries
- Treatments
  - All 2010 Barley Entries with and without fungicide applications
  - Weed control on all plots on the same day before GS20 (i.e., before tillering)
    - Complete Infosheet for weed control
  - Strip-plot design with 4 replications
    - Main: Entry
    - Strip: with and without fungicide applications
  - Two Fungicide Applications in the "Fungicide Treatment"
    - QUILT @ 750 mL ha^{-1} before Zadoks GS30 (i.e., before stem elongation) using flat-fan nozzles (medium droplets) at 200 L/ha (note: high volumes reduce drift on adjacent untreated plots; apply when risk for drift is low)
    - PROSARO 250 EC @ 0.8 L ha^{-1} (note: with no surfactant) using backward-forward nozzles or with TurboFlood Jet nozzles when the average growth stage across Entries is 2-3 days after heads fully emerged. Note: high volumes are important for coverage and to reduce drift on adjacent untreated plots; apply when risk for drift is low. http://www.omafra.gov.on.ca/english/crops/pub811/4additional.htm
- All plots rated as normal OCCC Protocol for variety assessment

Spring Oat 2010

- Locations:
  - Palmerston (Area II and IV; E.Sparry) – 15 entries
  - St. Mary's (Area II & IV; M.Etienne) – 15 entries
  - Ottawa (Area III; W.Yan/B.DeHaan) – 20 entries
  - Winchester (Area III; C.Wightman) – 20 entries
  - New Liskeard (Area V & VI; J.Rowsell) – 23 entries
- Treatments
  - All 2010 Oat Entries with and without fungicide applications
  - Weed control on all plots on the same day before GS20 (i.e., before tillering)
  - Strip-plot design with 4 replications
    - Main: Entry
    - Strip: with and without fungicide applications
  - One Fungicide Application
    - STRATEGO @ 0.5L ha^{-1} at Zadoks GS39 (i.e., flag leaves fully expanded) using flat-fan nozzles (medium droplets) at 200 L/ha (note: high spray volumes reduce drift on adjacent untreated plots; apply when risk for drift is low)
- All plots rated as normal OCCC Protocol

Winter Wheat 2010

- Locations:
  - Ridgetown (Area I; L.Tamburic) – 39+1 entries
  - Woodslee (Area I; H.Voldeng) – 39+1 entries
  - Palmerston (Area II and IV; E.Sparry) – 40 entries
  - Nairn (Area II & IV; M.Etienne) – 40 entries
- Treatments
  - All 2010 Winter Wheat Entries with and without fungicide applications
  - Weed control on all plots at same day as the QUILT application, before stem elongation GS30
  - Strip-plot design with 4 replications
    - Main: Entry
    - Strip: with and without fungicide applications
  - Two Fungicide Applications
    - Complete infosheet for each application
    - QUILT @ 750 mL ha^{-1} before Zadoks GS30 (i.e., before stem elongation) using flat-fan nozzles (medium droplets) at 200 L/ha (note: high volumes reduce drift on adjacent untreated plots; apply when risk for drift is low)
    - PROSARO 250 EC @ 0.8 L ha^{-1} using backward-forward nozzles or with Turbo FloodJet nozzles when the average growth stage is GS62-65 (from flowering initiated to full flowering). Note: high volumes are important for coverage and to reduce drift on adjacent untreated plots; apply when risk for drift is low. http://www.omafra.gov.on.ca/english/crops/pub811/4additional.htm
- All plots rated as normal OCCC Protocol

Statistical Analysis

- Data were analyzed using SAS PROC MIXED (SAS Institute, Cary, NC) as a strip-plot design with variey and fungicide treatment as simple effects and variety*fungicide as the interaction. Random effects were rep, rep*variety, and rep*fungicide. Yields were analyzed and LSMEANS were presented as t ha^{-1} or indexed within each of untreated and fungicide treatments. Preplanned contrasts were performed for each variety between untreated and fungicide treatments. Spearman Rank Correlation was performed on the LSMEANS using PROC CORR as a method to determine the strength of correlation ranks between the treated and untreated plots. At most locations, means of the variety characteristic data were observed from only one replication; no other statistical analyses were perfomed on these data.

E. Results

- Averaged across winter wheat varieties, yields at Harriston, Ridgeown, and Woodslee responded to fungicide by 18%, 13%, and 12% respectively (Tables 1-4).
- Note that the statistical design allows for greater precision and power for analyzing interactions between variety and fungicide (main interest), and less power to comparisons of untreated and fungicide averaged across varieties due to the stripping of the fungicide across variety plots.
- Yield varied from zero to 48% depending on the variety and location; these differential responses resulted in significant fungicide*variety interactions across all 4 locations in 2010 (interactions varied from $0.09 < p < 0.0001$; ANOVA not shown); this indicates that variety comparisons may be different with fungicide applications compared to those in untreated (Tables 1-4)
- Winter wheat variety yield rankings within untreated and fungicide-managed are presented in Figures 1a-1c; the 1:1 line indicates equal ranks between untreated and managed; varieties below the 1:1 line indicate a better rank in the fungicide managed.
- Averaged across spring wheat varieties, yield response to fungicide at Harriston, New Liskeard, Ottawa, St. Mary's, and Winchester increased by 15 (p=0.05), 4 (p=0.05), -1, 6, and 12% (p=0.05), respectively (Tables 5-9).
- In the spring wheat at Harriston and Winchester, over half the varieties responded to fungicide (up to 27%), causing significant variety*fungicide interactions (p<0.05; ANOVA not shown). However, inspite of these interactions, there was minimal impact on variety rankings between untreated and fungicide trials at Harriston and Winchester, but more significant rank changes at St. Mary's and Ottawa (Figures 2a-2c).
- Averaged across spring barley varieties, yield response to fungicide at Harriston, New Liskeard, Ottawa, St. Mary's, and Winchester increased by 12% (p<0.05), 10%, 19 (p<0.05), -2%, and 11%, respectively (Tables 10-14).
- In the spring barley at Harriston and Winchester, over half the varieties responded to fungicide (up to 33%), causing a significant variety*fungicide interaction at each of these locations (p<0.05; ANOVA not shown); yield response at St. Mary's was variable and unexpected with several varieties showing negative responses that are unexplained.
- Rank changes for barley are presented in Figures 3a-3c.
- Averaged across oat varieties, yield response to fungicide at Harriston, New Liskeard, St. Mary's, and Winchester increased by 10%, 5%, 50% (p<0.05), and 7% (p<0.05), respectively; fungicide response at Ottawa could not be determined because the untreated and fungicide-managed were conducted as two separate trials (Tables 15-19).
- Over half of the oat varieties responded to fungicide (up to over 300%), causing a significant variety*fungicide interaction at most locations (p<0.05; ANOVA not shown); yield response to fungicide at St. Mary's was highly dependent on variety (between 11 and over 300%).
- Rank changes for oat are presented in Figures 4a-4c.

F. Conclusions

- Overall, the response to fungicide depended on variety in most field locations for winter wheat, spring wheat, barley, and oat.
- Spearman rank correlations may not be useful to determine the significance of yield rank changes because varieties with inherently weak or strong genetics tend to be influential; other statistical methods are being investigated (data not shown).
- The greatest yield responses in specific varieties tend to be associated with control of disease.

G. Acknowledgements

- Funding for this project was gratefully received from Agricultural Adaptation Council (Farm Innovation Program), Ontario Cereal Crop Committee (OCCC), cereal variety sponsors, Grain Farmers of Ontario (GFO), Bayer CropScience, and Syngenta Crop Protection. We also gratefully acknowledge significant contributions of resource and expertise from trial managers who generated excellent data: Mark Etienne (Hyland Seeds), Morley McLean (AAFC Woodslee), John Rowsell (New Liskeard ARS), Tarlok Sahota (Thunder Bay ARS), Ellen Sparry (C&M Seeds), Lily Tamburic (UofG Ridgetown), Harvey Voldeng, Xuelian Wang, and Linda Langille (AAFC-Ottawa), Cheryl Wightman (UofG Kemptville), Weiki Yan and Brad deHaan (AAFC-Ottawa), Alek Choo and Jane Lunney (AAFC-Ottawa).

Table 1. Managed winter wheat performance at Harriston in 2010.

Class	Variety	Yield (t/ha)				Relative Yield Within Fungicide		Test Weight (kg/hL)		Thousand Kernel Weight (g)		Mildew (0-9)		Septoria (0-9)		Protein (%)	
		Fungicide		Δ%	p [1]	Fungicide		Fungicide		Fungicide		Fungicide		Fungicide		Fungicide	
		no	yes			no	yes	no	yes	no	yes	no	yes	no	yes	no	yes
HRW	AC Morley	4.50	5.20	16	*	90	89	77.1	78.0	41.6	41.9	3.0	0.4	5.6	3.0	12.3	10.5
	AC Sampson	5.49	5.95	8	ns	110	101	73.2	74.2	44.6	46.1	2.8	0.0	6.4	5.0	10.4	10.9
	ACS56113	4.53	5.85	29	***	91	100	71.3	72.9	39.3	42.6	2.4	0.1	7.9	4.6	11.4	10.0
	Harvard	4.70	5.83	24	**	94	99	74.3	75.6	44.1	46.5	4.7	0.6	7.1	4.6	13.1	9.9
	Keldin	4.91	5.42	10	ns	98	92	73.2	76.7	46.1	49.3	2.2	0.6	7.4	4.6	12.9	10.5
	Princeton	5.11	5.67	11	ns	103	97	74.3	76.2	43.9	47.3	5.1	2.2	7.0	5.0	12.3	9.8
	RCMTR101	3.85	5.68	48	***	77	97	69.9	74.2	34.4	44.0	4.7	1.0	9.0	5.9	12.4	10.2
	SC-06215R	5.67	6.09	7	ns	114	104	70.4	73.0	41.5	43.2	0.9	0.6	6.9	4.6	9.7	10.1
	Stanford	4.55	5.43	19	*	91	93	73.5	75.3	47.6	50.1	2.6	1.3	6.9	4.6	11.9	12.8
	Wentworth	5.49	5.84	6	ns	110	99	75.6	75.7	50.8	52.4	4.1	0.6	7.0	4.4	12.2	9.4
SRW	25R39	5.28	6.55	24	***	106	112	72.3	74.8	46.2	43.7	4.9	1.0	6.0	4.0	8.8	9.7
	25R47	4.56	5.83	28	***	91	99	70.0	73.5	36.4	39.4	5.0	0.4	7.6	3.6	9.2	10.0
	25R51	4.12	5.91	43	***	83	101	66.6	76.1	34.5	40.3	5.0	1.4	8.1	3.6	10.0	9.8
	25R56	5.27	6.32	20	**	106	108	68.8	71.8	35.3	40.1	4.0	0.0	6.6	3.7	9.8	10.0
	Becher	5.52	6.15	11	ns	111	105	71.9	73.7	37.4	42.2	4.1	0.1	6.4	3.6	10.8	9.1
	Branson	5.67	6.40	13	*	114	109	71.8	76.9	37.6	39.4	2.6	0.0	7.0	3.1	9.5	10.7
	Brooklyn	5.06	6.01	19	**	102	102	71.6	76.1	39.0	41.1	7.3	1.4	7.4	4.0	9.7	10.2
	CM614	5.58	6.31	13	*	112	107	72.0	75.1	38.5	42.8	3.7	0.6	6.9	4.4	11.5	9.8
	E1007R	5.21	6.30	21	**	105	107	72.6	76.3	40.0	40.6	3.6	0.1	7.4	4.4	10.0	10.4
	Emmit	5.07	5.76	14	*	102	98	71.2	73.5	45.0	45.3	4.6	0.1	6.0	2.7	11.2	9.6
	HY 116-SRW	5.42	5.96	10	ns	109	102	72.4	74.0	44.8	45.8	1.4	0.0	7.0	4.0	9.9	10.6
	Huntley	4.34	5.63	30	***	87	96	72.7	75.0	40.3	43.3	2.9	0.0	7.4	4.4	11.2	12.0
	Laurel	4.97	6.11	23	**	100	104	74.0	70.0	35.7	32.4	1.6	0.4	7.6	4.6	10.8	10.3
	Palmer	4.88	5.89	21	**	98	100	70.9	73.6	36.8	37.7	4.0	0.6	7.0	4.6	9.5	10.5
	R045	4.82	6.10	27	***	97	104	71.5	75.2	37.8	40.8	6.4	1.0	7.0	3.1	11.2	9.3
	R055	5.23	5.93	13	*	105	101	72.2	73.8	36.9	39.5	2.9	1.0	7.4	4.6	10.2	10.2
	RO85	5.54	6.27	13	*	111	107	74.2	76.4	37.4	39.7	4.0	1.0	7.0	4.0	10.4	11.7
	SC-07201R	5.63	6.05	7	ns	113	103	73.9	75.5	38.3	38.6	3.6	0.4	7.0	3.7	11.7	9.4
	SC-07203R	4.74	5.43	15	*	95	93	76.5	76.0	38.7	38.4	4.2	0.6	7.4	4.0	12.0	10.6
	TW271*099	5.01	5.51	10	ns	100	94	70.6	75.1	37.5	41.4	3.7	0.7	7.0	4.1	11.9	10.4
SWW	25W36	5.08	5.83	15	*	102	99	69.5	72.0	34.6	37.4	3.0	0.6	7.6	5.4	11.4	9.5
	AC Mackinnon	5.44	6.63	22	**	109	113	71.4	74.7	41.1	45.0	2.6	0.0	7.0	4.6	9.3	10.6
	Ava	5.05	6.04	20	**	101	103	76.8	75.0	42.4	41.0	4.1	1.3	6.4	4.4	10.9	9.3
	D8006W	5.54	5.83	5	ns	111	99	70.4	72.8	42.6	42.4	2.4	0.0	7.6	5.1	10.4	10.2
	E0028W	4.90	6.05	23	**	98	103	66.0	68.9	40.5	47.0	3.4	1.3	8.1	4.3	11.2	9.2
	E1009W	5.25	5.97	14	*	105	102	69.8	74.3	48.2	45.2	2.4	0.0	7.4	5.0	11.0	9.4
	RCDH-19/21	4.14	4.78	15	ns	83	81	70.6	74.9	48.3	49.1	2.1	0.0	6.0	4.0	13.1	11.3
	Superior	5.31	6.06	14	*	106	103	73.2	73.8	43.9	45.8	3.6	0.6	6.0	3.4	11.1	9.5
D	OAC Amber	3.08	4.30	40	***	62	73	71.2	73.8	42.2	49.0	5.7	1.7	7.0	4.4	12.3	12.2
Mean		4.99	5.87	18	**	100	100	72.0	74.5	40.8	43.0	3.6	0.6	7.1	4.2	11.0	10.3
$LSD_{0.05}$ (within fung)[2]		0.71		-	-	13		-	-	-	-	-	-	-	-	-	-

[1]Treated vs untreated contrast; ***,**,*,ns represents statistical significance at p =0.001, 0.01, 0.05, and >0.05, respectively.

[2]LSD = Fisher's Least Significant Difference at p =0.05

Table 2. Managed winter wheat performance at Nairn in 2010.

Class	Variety	Yield (t/ha)				Relative Yield Within Fungicide		Test Weight (kg/hL)		Thousand Kernel Weight (g)		Mildew (0-9)		Septoria (0-9)		Protein (%)	
		Fungicide		Δ%	p [1]	Fungicide		Fungicide		Fungicide		Fungicide		Fungicide		Fungicide	
		no	yes			no	yes	no	yes	no	yes	no	yes	no	yes	no	yes
HRW	AC Morley	5.11	4.85	-5	ns	95	89	75.3	74.4	39.7	40.0	3.4	2.9	4.5	0.6	10.0	10.2
	AC Sampson	5.44	6.01	10	*	101	110	73.0	73.1	40.8	44.5	3.9	3.6	11.3	5.9	9.9	9.7
	ACS56113	5.38	5.38	0	ns	100	99	70.7	71.5	40.2	40.0	5.3	3.6	3.7	2.6	9.2	9.4
	Harvard	4.96	4.78	-4	ns	93	88	75.0	75.0	44.2	44.1	4.3	3.6	4.3	3.8	10.6	10.3
	Keldin	4.72	5.40	14	ns	88	99	74.3	75.3	43.8	43.6	4.6	3.6	8.5	6.1	9.1	9.6
	Princeton	5.06	5.27	4	ns	94	97	73.9	73.9	45.0	45.0	4.3	3.6	7.9	3.0	9.9	9.8
	RCMTR101	5.37	5.55	3	ns	100	102	74.4	73.9	41.6	40.0	4.5	4.6	3.5	3.6	10.2	10.1
	SC-06215R	5.74	5.42	-6	ns	107	100	71.7	71.2	40.7	41.7	3.3	3.6	6.7	4.3	9.8	9.6
	Stanford	4.89	4.99	2	ns	91	92	71.6	72.6	44.8	43.8	4.3	4.3	5.1	2.2	10.6	10.9
	Wentworth	5.17	5.16	0	ns	96	95	74.9	75.1	46.2	46.7	4.6	4.3	8.2	5.3	10.9	10.6
SRW	25R39	6.01	5.53	-8	ns	112	102	71.2	71.6	38.8	39.3	3.3	3.2	2.2	2.2	9.4	8.7
	25R47	5.76	5.63	-2	ns	107	103	71.0	70.6	35.8	37.1	3.6	2.3	5.3	3.1	9.8	9.2
	25R51	5.56	5.42	-3	ns	104	99	70.3	70.0	36.0	33.1	4.0	3.2	4.9	1.6	10.0	9.7
	25R56	5.95	6.26	5	ns	111	115	69.8	72.9	32.4	32.1	3.3	3.6	4.8	2.0	9.7	9.1
	Becher	5.62	5.47	-3	ns	105	100	71.8	72.3	38.4	39.6	3.3	2.9	9.8	6.3	9.8	9.9
	Branson	5.50	5.63	2	ns	103	103	71.7	72.8	37.4	37.1	3.1	2.6	9.6	3.4	9.9	9.7
	Brooklyn	5.50	5.53	1	ns	103	102	72.6	73.1	34.5	34.4	4.3	3.2	5.3	5.2	9.8	9.6
	CM614	4.86	4.81	-1	ns	91	88	72.3	73.0	36.9	37.3	4.1	3.9	5.5	6.0	10.8	10.2
	E1007R	5.48	5.64	3	ns	102	103	72.3	71.5	37.2	35.7	4.6	4.2	5.5	4.4	10.1	10.0
	Emmit	5.86	5.34	-9	*	109	98	72.6	73.3	37.6	38.5	3.6	3.0	4.7	5.1	9.8	10.0
	HY 116-SRW	5.57	5.71	3	ns	104	105	71.9	72.2	41.9	40.5	3.3	3.3	6.7	3.7	10.5	9.9
	Huntley	5.54	5.72	3	ns	103	105	72.5	73.7	38.1	40.1	4.3	3.6	4.7	5.8	10.2	9.8
	Laurel	5.29	5.68	7	ns	99	104	70.2	72.3	32.7	32.2	3.0	3.3	7.5	3.7	9.7	10.0
	Palmer	5.28	5.52	5	ns	99	101	72.1	71.4	35.1	36.0	4.0	4.2	7.3	2.7	9.6	9.6
	R045	5.69	5.68	0	ns	106	104	72.9	72.4	34.4	36.4	3.9	3.3	6.2	6.8	9.7	9.7
	R055	5.23	5.13	-2	ns	97	94	72.6	71.9	34.2	35.2	3.7	3.4	5.1	4.5	10.0	10.4
	RO85	5.06	5.34	6	ns	94	98	73.5	72.7	32.3	33.4	3.9	3.0	3.9	2.5	10.3	10.7
	SC-07201R	5.68	5.73	1	ns	106	105	73.9	74.2	37.7	39.5	3.3	2.9	3.6	1.8	10.8	10.2
	SC-07203R	4.89	4.91	0	ns	91	90	72.5	73.2	35.4	34.2	4.3	3.6	3.4	2.3	10.6	10.4
	TW271*099	5.34	5.89	10	*	99	108	71.0	71.3	39.8	40.6	4.6	3.9	7.0	5.4	10.1	10.4
SWW	25W36	5.46	5.73	5	ns	102	105	71.0	71.0	33.5	35.0	4.0	2.6	6.4	2.8	9.8	9.7
	AC Mackinnon	5.16	5.60	9	ns	96	103	71.0	71.5	37.8	39.0	3.4	3.3	12.4	6.4	9.8	10.3
	Ava	5.47	5.72	5	ns	102	105	72.8	71.1	37.9	38.6	3.9	3.9	1.7	1.6	9.2	9.6
	D8006W	5.16	5.19	1	ns	96	95	70.9	70.4	40.2	40.8	4.2	4.6	8.4	9.9	10.5	9.9
	E0028W	5.30	5.44	3	ns	99	100	70.9	70.5	38.0	38.7	3.9	4.3	10.3	5.9	10.4	9.5
	E1009W	5.67	5.90	4	ns	106	108	71.9	73.2	36.7	39.7	3.6	3.9	4.6	3.7	10.6	10.5
	RCDH-19/21	5.56	5.55	0	ns	104	102	74.4	75.0	45.4	44.0	3.9	4.3	2.6	2.2	11.4	11.0
	Superior	5.24	5.45	4	ns	98	100	71.3	72.6	41.1	41.8	3.6	2.9	2.7	1.6	10.1	10.0
D	OAC Amber	4.59	4.47	-3	ns	86	82	74.6	74.3	42.0	44.5	3.6	3.3	21.6	18.8	10.7	9.8
Mean		5.36	5.45	2	ns	100	100	72.4	72.6	38.6	39.1	3.9	3.5	6.3	4.3	10.1	9.9
$LSD_{0.05}$ (within fung)[2]		0.30		-		5		-	-	-	-	-	-	-	-	-	-

[1]Treated vs untreated contrast; ***,**,*,ns represents statistical significance at p =0.001, 0.01, 0.05, and >0.05, respectively.

[2]LSD = Fisher's Least Significant Difference at p =0.05

Table 3. Managed winter wheat performance at Ridgetown in 2010.

Class	Variety	Yield (t/ha)				Relative Yield Within Fungicide		Test Weight (kg/hL)		Thousand Kernel Weight (g)		Mildew (0-9)		Septoria (0-9)		Septoria (0-9)	
		Fungicide		Δ%	p [1]	Fungicide		Fungicide		Fungicide		Fungicide		Fungicide		Fungicide	
		no	yes			no	yes	no	yes	no	yes	no	yes	no	yes	no	yes
HRW	AC Morley	6.29	6.47	3	ns	103	94	78.1	77.7	39.3	38.3	3.3	3.9	0.0	0.0	2.6	3.1
	ACS56113	5.50	6.46	17	***	90	93	75.2	77.5	37.4	42.4	2.8	0.7	0.3	0.0	2.6	2.4
	Harvard	5.67	6.75	19	***	93	98	78.6	79.7	43.1	44.7	3.9	3.6	0.1	0.0	3.3	3.9
	Keldin	5.95	7.34	23	***	98	107	77.6	78.1	42.2	42.9	3.8	3.1	0.0	0.0	3.1	3.7
	Princeton	5.88	7.12	21	***	97	103	78.1	78.9	44.9	45.5	3.2	6.6	0.0	0.0	2.4	4.0
	RCMTR101	6.19	6.89	11	***	102	100	77.0	76.2	41.4	42.0	4.3	4.7	0.0	0.0	4.0	3.9
	SC-06215R	6.19	6.86	11	**	102	100	74.6	75.7	38.2	41.8	1.6	1.9	0.0	0.0	2.1	2.9
	Stanford	5.52	6.38	16	***	91	93	76.2	76.0	42.3	45.9	2.1	1.7	0.0	0.0	2.1	2.1
	Wentworth	5.77	6.44	12	**	95	93	79.1	79.8	46.6	48.3	3.7	2.2	0.0	0.0	3.4	3.1
SRW	25R39	6.53	7.57	16	***	107	110	76.7	77.5	39.5	42.4	5.8	5.1	0.0	0.0	2.9	3.4
	25R47	6.28	7.13	14	***	103	104	75.9	76.9	40.5	42.1	2.9	4.7	0.0	0.0	2.0	3.1
	25R51	6.00	7.32	22	***	99	106	75.0	75.3	38.3	37.2	6.6	5.7	0.0	0.0	3.0	4.3
	25R56	6.74	7.81	16	***	111	113	74.9	75.1	32.6	36.6	5.1	3.7	0.0	0.0	3.6	2.7
	Becher	5.97	6.92	16	***	98	100	76.0	76.8	41.9	43.5	2.0	1.3	0.0	0.0	2.1	2.3
	Branson	6.22	7.16	15	***	105	104	75.4	75.6	36.2	35.9	2.4	2.9	0.4	0.0	2.0	2.2
	Brooklyn	5.92	7.06	19	***	97	102	75.6	76.1	38.0	39.0	1.8	1.6	0.3	0.0	1.8	1.9
	CM614	5.93	6.73	13	**	97	98	78.2	79.4	41.5	42.6	2.1	2.8	0.0	0.0	3.3	2.4
	E1007R	5.95	6.95	17	***	98	101	77.0	77.9	39.3	40.6	1.7	2.4	0.6	0.0	1.4	1.7
	Emmit	6.70	7.54	13	***	110	109	76.0	76.5	40.8	43.2	2.9	3.1	1.9	0.0	2.0	3.0
	HY 116-SRW	5.33	5.89	11	*	87	86	75.1	76.1	43.5	42.9	1.9	2.6	0.0	0.0	2.0	3.0
	Huntley	6.50	7.08	9	*	107	103	77.4	77.9	45.0	46.2	3.3	2.0	0.0	0.0	2.9	2.6
	Laurel	6.62	7.65	16	***	109	111	75.0	75.8	32.6	34.7	2.3	2.2	0.0	0.0	2.3	2.0
	Palmer	6.21	7.30	18	***	102	106	75.6	76.5	37.5	38.7	4.8	3.3	0.1	0.0	3.1	3.7
	R045	6.73	7.48	11	**	110	109	77.8	78.7	38.1	41.2	3.7	3.1	0.0	0.0	3.6	2.3
	R055	6.04	6.60	9	*	99	96	76.0	76.2	34.9	36.7	2.9	2.3	0.3	0.0	2.9	2.3
	RO85	6.13	6.81	11	**	101	99	77.7	78.0	34.9	35.1	2.8	2.8	0.0	0.0	2.0	2.9
	SC-07201R	6.14	6.70	9	*	101	97	78.0	78.4	38.9	39.3	2.4	2.6	0.0	0.0	2.0	2.6
	SC-07203R	6.20	6.94	12	**	102	101	78.1	79.1	35.5	36.1	5.4	6.0	0.0	0.0	2.3	2.8
	TW271*099	5.75	6.20	8	ns	94	90	75.7	75.8	41.4	42.1	4.6	4.2	0.3	0.0	2.3	2.6
SWW	25W36	6.85	7.17	5	ns	112	104	75.8	76.9	33.6	35.8	2.8	2.1	0.0	0.0	2.0	2.6
	AC Mackinnon	6.59	7.55	15	***	108	110	76.0	76.1	38.5	42.7	3.1	2.2	1.4	0.0	2.3	2.4
	Ava	6.79	7.26	7	ns	111	105	77.7	76.8	37.1	38.7	4.1	4.3	1.3	0.0	2.8	3.1
	D8006W	6.14	6.53	6	ns	101	92	74.9	76.1	41.7	44.3	2.4	2.1	0.0	0.0	2.8	2.4
	E0028W	6.10	6.64	9	*	100	96	74.6	75.1	44.2	46.5	3.4	1.8	0.6	0.0	2.6	2.8
	E1009W	6.47	7.46	15	***	106	108	77.9	77.0	41.1	43.1	2.8	2.1	1.6	0.0	2.4	3.0
	RCDH-19/21	5.17	5.61	9	ns	85	81	75.1	74.9	41.1	41.3	2.8	1.9	0.0	0.0	2.0	2.6
	Superior	6.04	6.95	15	***	99	101	74.3	74.9	40.7	43.4	3.7	3.6	0.0	0.0	4.2	3.6
D	OAC Amber	4.37	5.13	17	**	72	75	79.4	79.2	40.6	43.0	4.1	3.6	0.0	0.0	2.7	2.9
Mean		6.09	6.89	13	**	100	100	76.5	77.0	39.6	41.2	3.3	3.1	0.2	0.0	2.6	2.9
$LSD_{0.05}$ (within fung)[2]		0.63		-	-	9		-	-	-	-	-	-	-	-	-	-

[1]Treated vs untreated contrast; ***,**,*,ns represents statistical significance at p =0.001, 0.01, 0.05, and >0.05, respectively.

[2]LSD = Fisher's Least Significant Difference at p =0.05

Table 4. Managed winter wheat performance at Woodslee in 2010.

Class	Variety	Yield (t/ha)				Relative Yield Within Fungicide		Test Weight (kg/hL)		Thousand Kernel Weight (g)		Mildew (0-9)	
		Fungicide		Δ%	p [1]	Fungicide		Fungicide		Fungicide		Fungicide	
		no	yes			no	yes	no	yes	no	yes	no	yes
HRW	AC Morley	5.19	5.40	4	ns	89	83	76.9	76.9	37.5	39.0	3.4	1.4
	ACS56113	5.78	7.08	22	***	100	109	73.5	72.3	45.3	47.1	4.1	1.5
	Harvard	5.12	5.54	8	ns	88	85	75.6	76.6	45.8	47.6	7.4	2.3
	Keldin	5.98	6.41	7	ns	103	99	74.5	74.8	43.9	46.9	7.7	2.7
	Princeton	6.10	6.12	0	ns	105	94	77.2	77.3	46.9	49.3	7.7	2.1
	RCMTR101	5.56	6.72	21	***	96	99	76.2	74.6	46.6	49.3	5.1	2.8
	SC-06215R	6.62	7.74	17	***	114	119	73.9	74.3	43.9	47.5	3.6	1.3
	Stanford	5.11	5.87	15	*	88	91	75.1	74.6	51.4	51.5	6.0	0.4
	Wentworth	6.20	6.32	2	ns	107	98	77.0	76.6	48.1	49.2	3.0	1.0
SRW	25R39	6.74	8.15	21	***	116	126	73.9	74.3	40.8	41.9	2.1	0.3
	25R47	7.11	7.46	5	ns	122	115	73.5	73.2	44.3	43.8	3.6	0.0
	25R51	5.50	6.59	20	***	95	102	73.3	73.3	43.1	44.2	4.6	0.3
	25R56	6.57	7.20	10	*	113	111	73.9	73.9	38.6	44.9	2.4	0.6
	Becher	4.64	4.91	6	ns	80	73	74.6	75.0	45.6	46.5	3.6	0.0
	Branson	4.95	6.66	35	***	85	103	72.9	73.5	43.2	45.4	2.8	0.0
	Brooklyn	6.23	6.90	11	*	107	106	74.0	74.9	43.6	47.4	4.3	0.0
	CM614	6.60	6.99	6	ns	113	108	76.8	76.3	49.2	48.2	3.0	0.1
	E1007R	6.29	6.65	6	ns	108	103	74.6	73.8	46.3	47.1	3.3	0.0
	Emmit	6.13	6.72	10	ns	106	104	74.2	74.3	41.5	40.3	4.3	0.3
	HY 116-SRW	5.50	6.57	19	***	95	101	72.1	72.9	47.8	46.1	3.4	2.8
	Huntley	5.57	5.83	5	ns	96	90	74.9	75.5	50.1	50.8	4.6	0.0
	Laurel	5.19	6.69	29	***	89	103	72.6	73.2	34.6	36.6	4.6	0.3
	Palmer	6.50	7.25	12	*	112	112	74.3	74.3	42.0	46.1	5.6	0.8
	R045	6.84	6.86	0	ns	118	106	74.5	74.6	41.7	45.8	2.3	0.9
	R055	5.71	6.21	9	ns	98	96	73.6	74.0	43.9	46.4	4.5	1.9
	RO85	5.68	6.67	17	**	98	103	75.6	76.5	39.9	42.6	3.8	0.3
	SC-07201R	6.38	6.85	7	ns	110	106	76.6	76.0	40.2	44.1	4.7	2.1
	SC-07203R	5.25	6.08	16	**	90	94	77.2	77.2	43.0	44.0	5.5	2.6
	TW271*099	5.89	6.66	13	*	101	101	74.3	73.6	43.8	44.1	1.7	0.4
SWW	25W36	6.26	6.87	10	*	108	106	72.5	72.2	40.1	41.7	5.6	1.3
	AC Mackinnon	6.67	6.78	2	ns	115	105	74.2	73.3	47.6	47.6	4.7	0.6
	Ava	5.88	6.44	10	ns	101	99	75.2	75.2	42.1	42.7	3.9	0.1
	D8006W	5.71	6.43	13	*	98	99	73.8	74.3	47.2	49.0	7.4	0.9
	E0028W	6.38	7.05	11	*	110	109	72.6	72.3	47.6	46.4	7.2	0.6
	E1009W	6.11	7.11	16	**	105	110	70.9	71.5	48.7	48.1	3.3	2.4
	RCDH-19/21	5.11	5.20	2	ns	88	80	73.6	74.9	50.8	48.4	5.4	0.8
	Superior	5.60	6.47	16	**	96	100	72.9	72.3	43.3	45.1	2.4	0.3
D	OAC Amber	2.19	2.99	37	*	38	46	75.9	76.2	47.1	46.9	5.8	2.2
Mean		5.81	6.49	12	**	100	100	74.4	74.5	44.4	45.8	4.4	1.0
$LSD_{0.05}$ (within fung)[2]		0.78		-	-	12		-	-	-	-	-	-

[1]Treated vs untreated contrast; ***,**,*,ns represents statistical significance at p =0.001, 0.01, 0.05, and >0.05, respectively.

[2]LSD = Fisher's Least Significant Difference at p =0.05

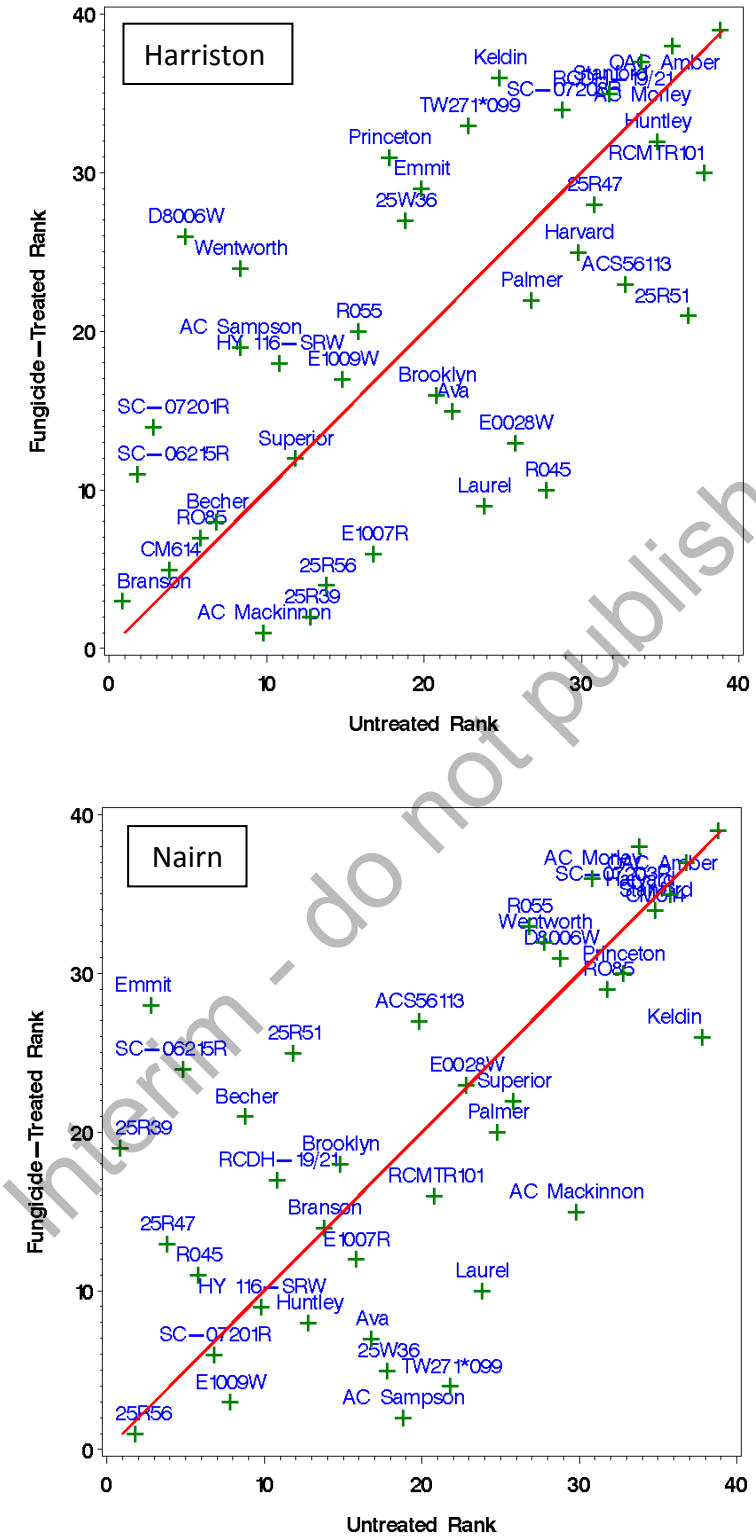
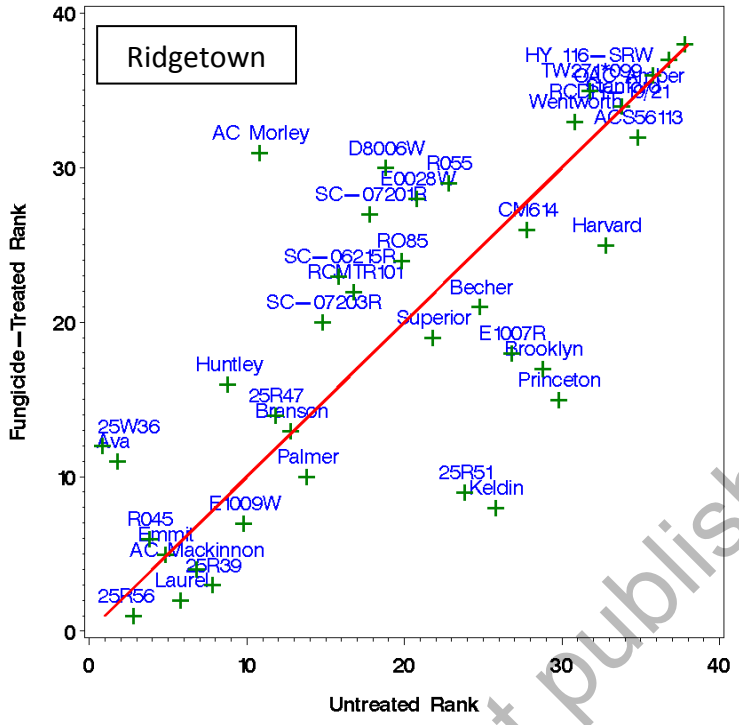


Figure 1a. Rank order of winter wheat varieties from highest to lowest grain yields within fungicide and untreated treatments at Harriston and Nairn, 2010.



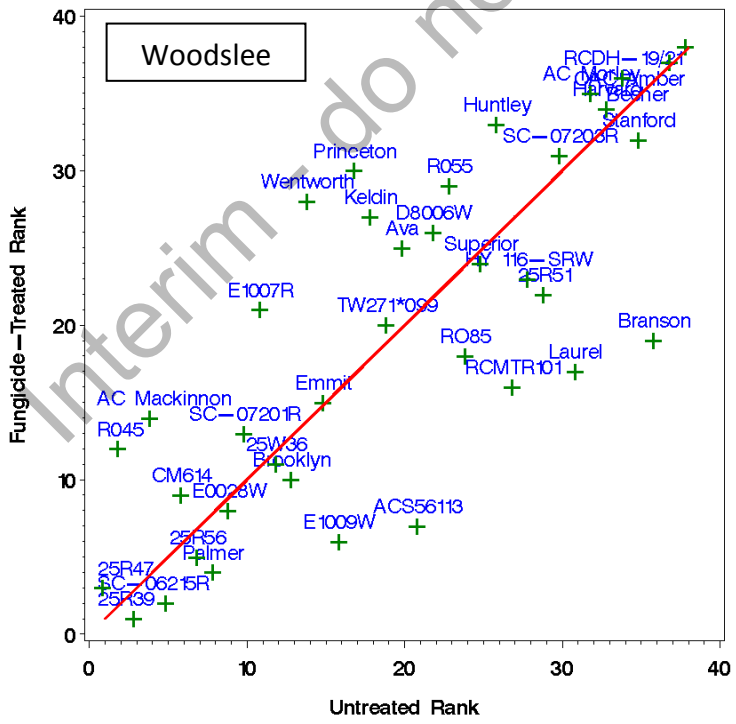


Figure 1b. Rank order of winter wheat varieties from highest to lowest grain yields within fungicide and untreated treatments at Ridgetown and Woodslee, 2010.

Table 5. Managed spring wheat performance at Harriston in 2010.

Class	Variety	Yield (t/ha)				Relative Yield Within Fungicide		Test Weight (kg/hL)		Thousand Kernel Weight (g)		Septoria (0-9)		Head Blight (0-100)		Protein (%)	
		Fungicide		Δ%	p [1]	Fungicide		Fungicide		Fungicide		Fungicide		Fungicide		Fungicide	
		no	yes			no	yes	no	yes	no	yes	no	yes	no	yes	no	yes
EFS	HY 162-HRF	3.85	4.35	13	*	129	126	70.7	74.0	39.0	45.6	6.6	5.6	56.7	24.4	13.7	13.3
	Tokson	3.16	3.74	18	**	106	109	73.2	74.1	30.3	33.3	6.1	4.0	30.0	14.4	13.8	13.3
HRS	98S017-01	2.66	3.37	27	***	89	98	72.9	76.4	30.0	32.0	7.6	5.9	30.0	18.3	13.3	13.4
	ACS54617	3.54	4.34	23	***	119	126	76.2	73.6	31.7	33.2	6.0	4.4	26.7	9.4	12.8	12.9
	AW625	3.96	4.12	4	ns	133	120	75.2	76.1	37.6	42.7	6.0	4.1	7.8	5.0	13.2	13.5
	CFB0601	2.81	3.14	12	ns	94	91	76.5	78.4	28.2	29.0	7.0	5.9	10.0	7.2	14.1	13.8
	Carberry	2.53	2.74	8	ns	85	80	72.9	74.2	32.0	33.6	7.6	6.0	12.2	10.0	15.7	16.0
	Glenn	2.55	2.84	11	ns	86	83	78.0	74.1	29.5	31.3	6.6	5.9	15.6	10.0	14.7	14.5
	HY 124-HRS	3.12	3.50	12	*	105	102	69.7	72.8	34.3	37.1	5.9	4.0	26.7	11.1	15.0	14.8
	Helios	2.74	2.86	4	ns	92	83	72.8	74.7	35.6	34.8	7.1	5.9	11.1	5.0	15.5	14.6
	Kane	2.84	3.19	12	ns	95	93	72.6	76.2	29.7	32.0	6.6	6.4	16.7	7.8	14.9	14.6
	Norwell	3.30	3.97	20	***	111	115	75.0	78.8	32.7	35.0	6.9	5.0	21.1	10.0	14.6	13.8
	SQB001	3.07	3.62	18	**	103	105	72.4	75.6	27.2	31.7	6.1	5.6	10.0	5.0	14.6	14.2
	SQB004	2.86	3.07	7	ns	96	89	75.7	76.1	33.4	34.4	6.0	4.6	15.6	7.2	16.1	15.6
	Sable	3.06	3.71	21	**	103	108	72.3	75.6	31.9	35.4	6.9	4.0	41.1	15.6	15.0	14.0
	Superb	2.52	3.12	24	**	85	91	71.0	74.1	31.0	38.2	7.1	7.0	30.0	14.4	15.3	14.2
	Touran	2.96	3.61	22	**	100	105	73.8	76.5	38.0	43.2	7.1	6.3	11.1	5.0	14.8	15.6
	W984-8767	3.23	3.54	10	ns	109	103	75.6	73.2	34.5	36.8	6.9	5.0	14.4	7.2	15.1	14.7
SD	Hallmark	1.79	2.59	45	***	60	75	66.8	72.8	30.4	38.8	6.1	4.9	32.2	10.0	15.5	14.6
Mean		2.98	3.44	15	*	100	100	73.3	75.1	32.5	35.7	6.6	5.3	22.1	10.4	14.6	14.3
$LSD_{0.05}$ (within fung)[2]		0.39		-	-	12		-	-	-	-	-	-	-	-	-	-

[1]Treated vs untreated contrast; ***,**,*,ns represents statistical significance at p =0.001, 0.01, 0.05, and >0.05, respectively.

[2]LSD = Fisher's Least Significant Difference at p =0.05

Table 6. Managed spring wheat performance at New Liskeard in 2010.

Class	Variety	Yield (t/ha)				Relative Yield Within Fungicide		Test Weight (kg/hL)		Thousand Kernel Weight (g)		Straw Yield (t/ha)	
		Fungicide		Δ%	p [1]	Fungicide		Fungicide		Fungicide		Fungicide	
		no	yes			no	yes	no	yes	no	yes	no	yes
EFS	Batiscan	5.43	5.22	-4	ns	111	108	73.0	73.3	48.4	47.9	4.81	5.50
	HY 162-HRF	5.19	5.24	1	ns	106	108	70.8	71.5	44.1	44.8	3.93	4.13
	Tokson	4.87	5.03	3	ns	99	104	73.7	74.3	39.3	39.3	3.88	3.95
HRS	98S017-01	5.23	4.95	-5	ns	107	102	72.6	73.6	37.5	37.9	3.95	3.85
	AC Brio	4.96	4.79	-3	ns	101	99	73.1	73.4	42.5	41.8	5.04	4.46
	ACS54617	4.77	4.52	-5	ns	97	93	70.6	71.2	35.9	36.1	5.55	4.48
	AW625	5.27	5.36	2	ns	108	111	74.0	73.8	44.2	43.1	4.99	4.81
	BS03-244	4.97	4.89	-2	ns	101	101	74.7	74.6	40.5	40.3	4.81	4.64
	CFB0601	4.87	4.59	-6	ns	99	95	74.8	75.3	38.8	38.6	5.40	4.58
	Carberry	5.02	4.70	-6	ns	100	97	73.4	74.3	36.8	37.1	4.46	4.41
	Glenn	4.36	4.37	0	ns	89	90	75.2	75.9	36.2	36.2	3.72	3.44
	HY 124-HRS	4.68	4.12	-12	*	96	85	72.3	73.0	44.7	44.3	5.98	5.32
	Helios	4.09	4.43	8	ns	83	92	71.5	72.3	37.7	38.5	4.26	4.31
	KINGSEY	5.20	5.28	2	ns	106	109	74.3	74.7	46.0	45.6	5.85	5.80
	Kane	4.53	4.53	0	ns	92	94	73.8	74.5	37.2	37.2	4.76	3.88
	MAGOG	4.71	4.57	-3	ns	96	95	73.2	73.5	41.6	40.9	4.23	4.15
	MAJOR	4.79	4.90	2	ns	98	101	74.4	74.4	42.4	41.7	4.58	5.24
	Megantic	4.72	4.45	-6	ns	96	92	73.0	73.4	41.8	41.3	5.12	4.86
	Norwell	4.86	4.71	-3	ns	99	97	74.4	74.7	38.0	38.1	4.51	4.23
	Orleans	4.63	4.81	4	ns	94	99	73.4	73.5	42.5	41.6	4.23	4.56
	RICHELIEU	5.27	5.22	-1	ns	108	108	72.2	72.8	43.1	43.4	5.09	4.74
	SQB001	5.48	5.38	-2	ns	112	111	73.8	74.5	38.6	38.5	4.79	4.36
	SQB004	4.55	4.39	-4	ns	93	91	72.4	72.8	37.1	37.2	4.96	4.46
	Sable	5.15	5.04	-2	ns	105	104	73.8	74.8	38.8	38.5	4.79	6.08
	Touran	4.76	4.77	0	ns	97	99	73.9	74.1	46.0	46.2	4.96	4.89
	W984-8767	4.86	4.84	0	ns	99	100	73.0	73.2	42.0	41.7	4.64	4.23
SD	Hallmark	5.27	5.51	5	ns	108	114	72.8	75.0	42.6	45.2	3.85	3.93
Mean		4.91	4.84	-1	ns	100	100	73.3	73.8	40.9	40.9	4.71	4.57
$LSD_{0.05}$ (within fung)[2]		0.48		-	-	10		-	-	-	-	-	-

[1]Treated vs untreated contrast; ***,**,*,ns represents statistical significance at p =0.001, 0.01, 0.05, and

[2]LSD = Fisher's Least Significant Difference at p =0.05

Table 7. Managed spring wheat performance at Ottawa, 2010.

Class	Variety	Yield (t/ha)				Relative Yield Within Fungicide		Test Weight (kg/hL)		Thousand Kernel Weight (g)		Leaf Rust (0-9)		Septoria (0-9)		Head Blight (0-100)		Protein (%)	
		Fungicide		Δ%	p [1]	Fungicide		Fungicide		Fungicide		Fungicide		Fungicide		Fungicide		Fungicide	
		no	yes			no	yes	no	yes	no	yes	no	yes	no	yes	no	yes	no	yes
EFS	Batiscan	2.79	2.93	5	ns	111	111	72.1	72.1	41.1	43.1	5.7	0.0	5.6	1.0	25.6	7.3	14.8	14.8
EFS	HY 162-HRF	2.60	2.65	2	ns	103	101	71.0	71.9	39.6	40.4	1.9	0.0	6.4	1.3	53.8	28.1	15.2	15.4
EFS	Tokson	2.80	2.89	3	ns	111	110	74.5	74.7	34.3	35.3	1.3	0.0	6.3	0.4	35.9	10.1	15.0	14.9
HRS	98S017-01	2.48	2.48	0	ns	99	94	73.2	74.0	32.4	33.2	1.6	0.0	6.6	1.0	22.6	10.7	15.7	15.8
HRS	AC Brio	2.65	2.66	0	ns	105	101	72.7	73.6	37.2	37.0	2.8	0.0	6.8	0.8	34.8	7.6	16.1	16.3
HRS	ACS54617	2.08	2.47	19	***	83	94	70.4	71.2	31.3	32.2	4.7	0.0	7.2	0.4	26.5	6.2	15.2	15.0
HRS	AW625	3.26	3.33	2	ns	129	126	74.2	74.0	38.7	38.2	4.6	0.0	4.9	0.1	0.3	0.1	14.2	13.5
HRS	BS03-244	2.58	3.01	17	***	103	114	75.8	75.4	35.4	36.0	5.1	0.0	6.6	0.0	0.9	0.1	15.1	15.0
HRS	CFB0601	2.31	2.43	5	ns	92	92	75.2	76.1	34.3	34.8	3.3	0.0	7.6	0.9	34.1	13.7	15.8	16.1
HRS	Carberry	2.42	2.64	9	*	96	100	74.2	74.6	31.8	33.4	0.0	0.0	7.9	1.5	62.4	30.8	16.5	16.3
HRS	Glenn	2.05	2.11	3	ns	81	80	76.7	77.0	31.0	31.2	0.3	0.0	7.1	2.0	37.6	7.8	16.1	16.0
HRS	HY 124-HRS	2.41	2.61	8	ns	96	99	72.6	73.8	37.0	37.1	1.9	0.0	4.9	0.9	41.1	12.8	16.7	16.7
HRS	Helios	2.23	2.52	13	**	89	96	71.9	73.0	34.5	36.0	0.8	0.0	6.5	1.3	55.1	18.1	16.8	17.0
HRS	KINGSEY	3.06	3.37	10	**	121	128	74.5	75.1	41.0	42.4	6.0	0.0	6.0	0.1	4.5	1.1	14.3	14.4
HRS	Kane	2.19	2.14	-2	ns	87	81	73.7	73.8	32.2	32.1	1.3	0.0	8.1	1.9	46.3	26.9	16.5	16.6
HRS	MAGOG	2.73	2.45	-10	*	108	93	73.0	73.6	36.8	36.6	0.9	0.0	7.3	1.8	31.9	19.1	16.0	16.0
HRS	MAJOR	2.88	2.89	0	ns	114	110	75.2	75.2	36.2	36.2	3.2	0.0	4.9	0.0	0.2	0.1	14.7	14.5
HRS	Megantic	2.25	2.28	1	ns	89	87	73.7	74.2	35.8	37.0	1.6	0.0	7.3	2.1	41.2	14.4	15.6	16.1
HRS	Norwell	2.25	2.29	2	ns	89	87	73.7	74.2	32.9	33.5	2.6	0.0	6.6	1.5	29.3	10.2	16.1	16.3
HRS	Orleans	2.78	2.80	1	ns	110	106	73.0	73.4	37.6	38.1	2.5	0.0	7.4	1.8	43.1	21.8	15.6	15.6
HRS	RICHELIEU	2.43	2.39	-2	ns	97	91	72.7	72.9	37.0	36.9	3.8	0.0	7.9	0.0	10.1	0.6	15.7	15.5
HRS	SQB001	2.19	2.26	3	ns	87	86	72.6	72.5	32.4	32.8	3.1	0.0	7.3	1.4	35.4	14.4	15.9	16.4
HRS	SQB004	2.65	2.65	0	ns	105	101	72.4	72.6	32.0	32.9	0.3	0.0	6.5	1.0	40.6	20.0	17.5	17.2
HRS	Sable	2.37	2.56	8	ns	94	97	71.1	71.7	31.5	31.9	6.4	0.0	6.5	1.4	51.8	19.6	16.6	16.6
HRS	Touran	2.67	2.93	10	*	106	111	73.8	73.8	40.3	41.3	1.9	0.0	6.4	0.8	21.8	9.7	15.8	16.4
HRS	W984-8767	2.73	2.91	7	ns	108	111	72.6	72.5	36.0	36.1	2.1	0.0	4.4	0.0	6.3	0.8	15.3	15.4
SD	Hallmark	2.18	2.46	13	*	87	93	74.2	75.5	37.4	39.2	0.3	0.0	6.0	0.7	14.9	3.0	15.0	15.0
Mean		2.52	2.63	4	*	100	100	73.4	73.8	35.5	36.1	2.6	0.0	6.6	1.0	29.9	11.7	15.7	15.7
$LSD_{0.05}$ (within fung)[2]		0.27		-	-	11		-	-	-	-	-	-	-	-	-	-	-	-

[1]Treated vs untreated contrast; ***,**,*,ns represents statistical significance at p =0.001, 0.01, 0.05, and >0.05, respectively.

[2]LSD = Fisher's Least Significant Difference at p =0.05

Table 8. Managed spring wheat performance at St. Mary's in 2010.

Class	Variety	Yield (t/ha)				Relative Yield Within Fungicide		Test Weight (kg/hL)		Thousand Kernel Weight (g)		Septoria (0-9)	
		Fungicide		Δ%	*p* [1]	Fungicide		Fungicide		Fungicide		Fungicide	
		no	yes			no	yes	no	yes	no	yes	no	yes
EFS	HY 162-HRF	3.86	3.55	-8	ns	114	99	69.2	71.3	39.8	43.2	0.3	0.0
	Tokson	3.49	3.57	2	ns	103	100	70.8	72.7	35.7	38.0	0.7	0.2
HRS	98S017-01	3.32	3.85	16	ns	98	107	70.4	72.6	34.2	36.7	1.1	1.0
	ACS54617	3.23	3.35	4	ns	95	93	67.3	69.7	30.8	33.1	0.7	0.5
	AW625	3.50	3.57	2	ns	103	99	70.9	72.4	38.0	40.1	0.5	1.0
	CFB0601	3.13	3.64	16	ns	92	101	72.6	73.8	32.4	34.3	0.2	0.3
	Carberry	3.43	3.53	3	ns	101	98	71.2	72.1	32.8	35.6	0.3	0.0
	Glenn	3.13	3.52	12	ns	92	98	74.3	74.9	32.1	33.0	0.2	0.1
	HY 124-HRS	3.46	3.52	2	ns	102	98	68.5	70.3	40.2	42.6	0.6	0.5
	Helios	3.31	3.45	4	ns	98	96	69.3	71.0	33.2	35.1	0.9	0.7
	Kane	3.24	3.76	16	ns	95	105	71.6	73.1	33.1	34.2	0.4	0.5
	Norwell	3.37	3.66	9	ns	99	102	71.8	72.9	33.7	35.0	0.5	0.7
	SQB001	3.64	3.47	-5	ns	107	97	70.0	72.4	31.9	34.7	0.3	0.5
	SQB004	3.58	3.54	-1	ns	105	99	70.9	72.3	33.6	35.3	0.9	0.7
	Sable	3.68	3.52	-4	ns	109	98	69.5	71.9	35.2	38.7	0.2	0.0
	Superb	3.17	4.13	30	ns	94	115	68.6	71.0	36.1	40.1	0.3	0.5
	Touran	3.49	3.39	-3	ns	103	94	71.1	73.3	41.8	44.5	0.7	0.7
	W984-8767	3.28	3.51	7	ns	97	98	70.5	71.3	36.6	38.7	0.5	0.3
SD	Hallmark	3.15	3.65	16	ns	93	102	67.2	71.8	38.6	42.7	0.2	0.3
Mean		3.39	3.59	6	ns	100	100	70.3	72.1	35.3	37.7	0.5	0.4
$LSD_{0.05}$ (within fung)[2]		ns		-	-	ns		-	-	-	-	-	-

[1]Treated vs untreated contrast; ***,**,*,ns represents statistical significance at *p* =0.001, 0.01, 0.05, and

[2]LSD = Fisher's Least Significant Difference at *p* =0.05

Table 9. Managed spring wheat performance at Winchester in 2010.

Class	Variety	Yield (t/ha)				Relative Yield Within Fungicide		Test Weight (kg/hL)		Thousand Kernel Weight (g)		Straw Yield (t/ha)	
		Fungicide		Δ%	p [1]	Fungicide		Fungicide		Fungicide		Fungicide	
		no	yes			no	yes	no	yes	no	yes	no	yes
EFS	Batiscan	4.07	4.29	5	ns	109	103	68.2	67.0	44.0	47.1	3.58	3.51
	HY 162-HRF	4.38	5.00	14	***	117	120	67.2	67.2	43.9	44.8	3.29	3.55
	Tokson	4.06	4.47	10	*	109	108	72.5	73.6	34.7	36.8	2.74	2.37
HRS	98S017-01	4.14	4.56	10	*	111	110	71.0	71.1	34.6	34.7	2.81	2.41
	AC Brio	3.57	3.93	10	*	96	95	69.8	71.2	38.2	39.4	2.94	3.12
	ACS54617	4.05	4.63	14	**	109	111	66.0	68.8	31.6	34.5	3.30	2.55
	AW625	4.28	4.64	8	*	115	111	67.7	68.2	39.1	39.6	3.68	3.82
	BS03-244	3.90	4.04	4	ns	105	97	72.2	72.1	35.4	36.0	3.26	3.31
	CFB0601	4.00	4.32	8	ns	107	104	70.0	72.8	33.9	33.3	3.12	2.96
	Carberry	3.86	4.27	11	*	104	103	69.0	72.9	32.8	33.6	2.69	2.90
	Glenn	3.43	3.70	8	ns	92	90	72.6	69.9	29.2	32.9	2.04	2.38
	HY 124-HRS	3.35	3.86	15	**	90	93	67.8	69.5	35.0	41.0	2.91	2.94
	Helios	3.49	3.53	1	ns	94	85	68.7	70.1	33.0	37.1	3.04	3.07
	KINGSEY	3.58	3.99	11	*	96	96	69.2	71.3	40.9	42.9	3.26	3.43
	Kane	3.59	4.09	14	**	96	98	70.1	72.8	33.1	33.8	3.13	3.21
	MAGOG	3.32	3.78	14	**	89	91	69.5	71.0	38.0	38.8	2.74	2.84
	MAJOR	3.84	4.01	4	ns	103	96	71.3	71.2	36.7	37.1	3.23	3.56
	Megantic	3.51	3.96	13	*	94	95	71.8	73.2	38.1	40.5	3.26	3.56
	Norwell	3.66	4.28	17	***	98	103	69.4	69.3	32.6	36.1	2.94	2.85
	Orleans	3.44	3.90	13	**	92	94	67.2	69.9	39.4	39.3	2.73	2.96
	RICHELIEU	3.86	4.22	9	*	104	101	68.8	69.9	39.8	38.8	3.26	3.34
	SQB001	3.95	4.53	15	***	106	109	65.7	70.6	33.7	35.8	3.24	3.28
	SQB004	3.52	3.99	13	**	94	96	69.3	71.8	33.9	32.6	3.12	3.27
	Sable	4.01	4.48	12	*	107	108	69.1	70.0	31.5	33.7	2.57	2.63
	Touran	4.00	4.33	8	*	107	104	71.5	73.6	42.7	44.9	3.24	3.23
	W984-8767	3.70	3.91	6	ns	99	94	70.6	71.7	37.2	38.0	3.61	3.97
SD	Hallmark	2.12	3.56	68	***	57	85	58.9	63.8	31.5	36.9	2.56	2.25
Mean		3.73	4.16	12	*	100	100	69.1	70.5	36.1	37.9	3.05	3.08
$LSD_{0.05}$ (within fung)[2]		0.42		-	-	11		-	-	-	-	-	-

[1]Treated vs untreated contrast; ***,**,*,ns represents statistical significance at p =0.001, 0.01, 0.05, and

[2]LSD = Fisher's Least Significant Difference at p =0.05

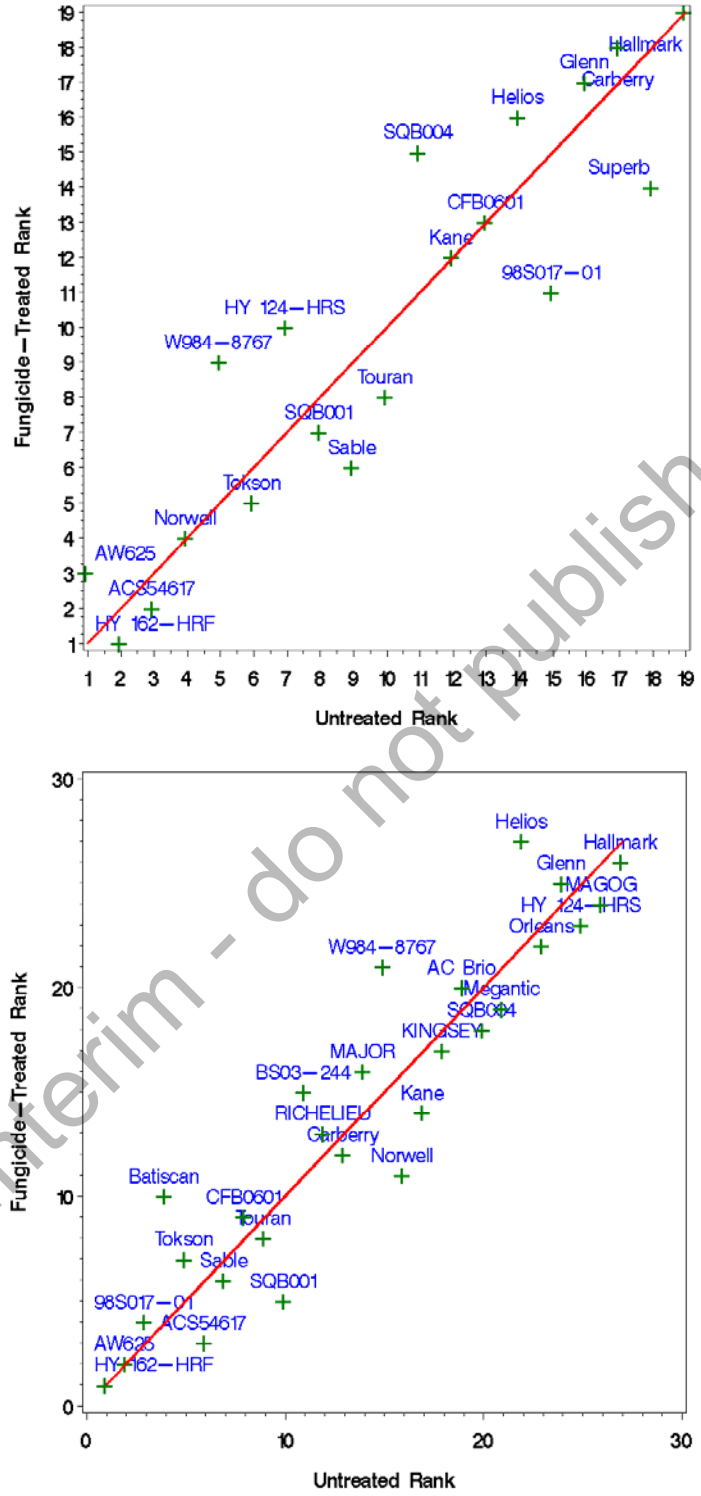


Figure 2a. Rank order of spring wheat varieties from highest to lowest grain yields within fungicide and untreated treatments at Harriston (upper) and Winchester (lower), 2010.

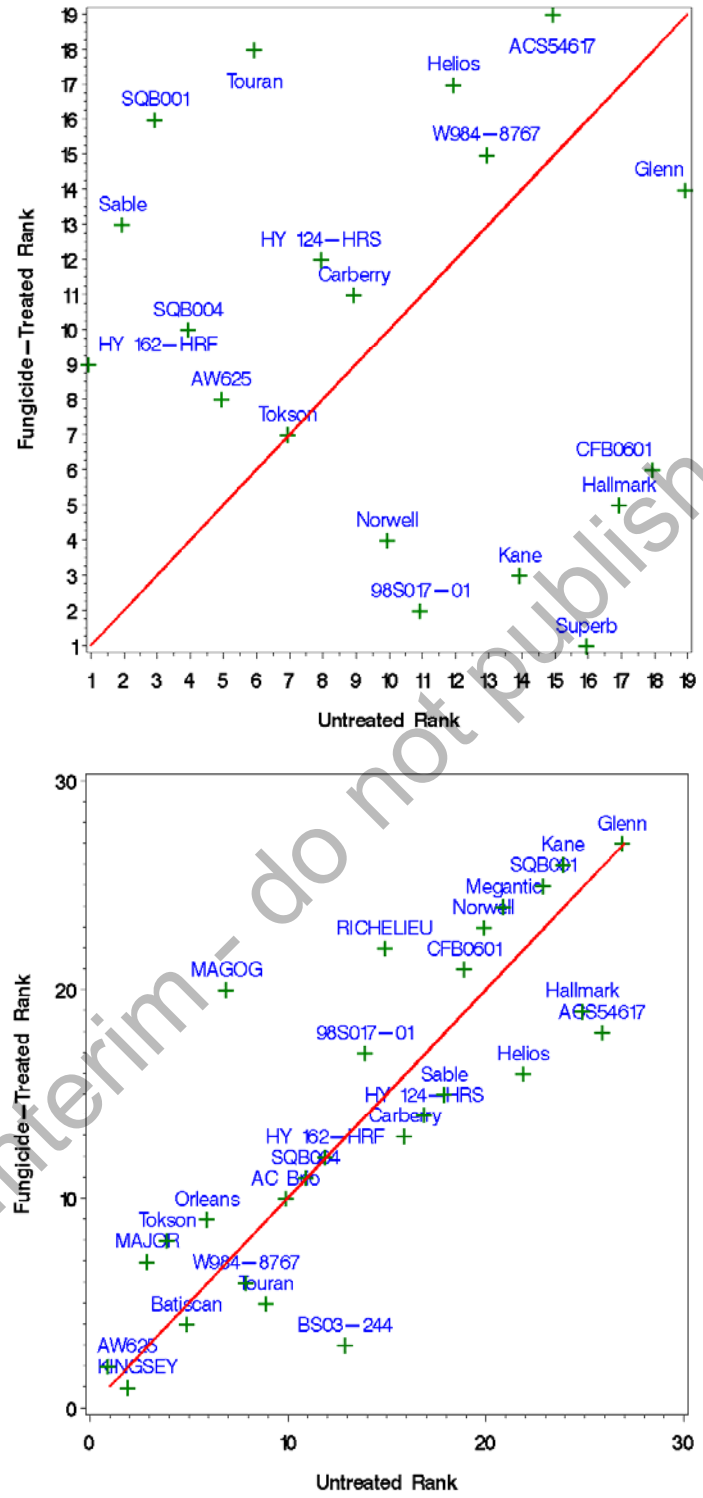


Figure 2b. Rank order of spring wheat varieties from highest to lowest grain yields within fungicide and untreated treatments at St. Mary's (upper) and Ottawa (lower), 2010.

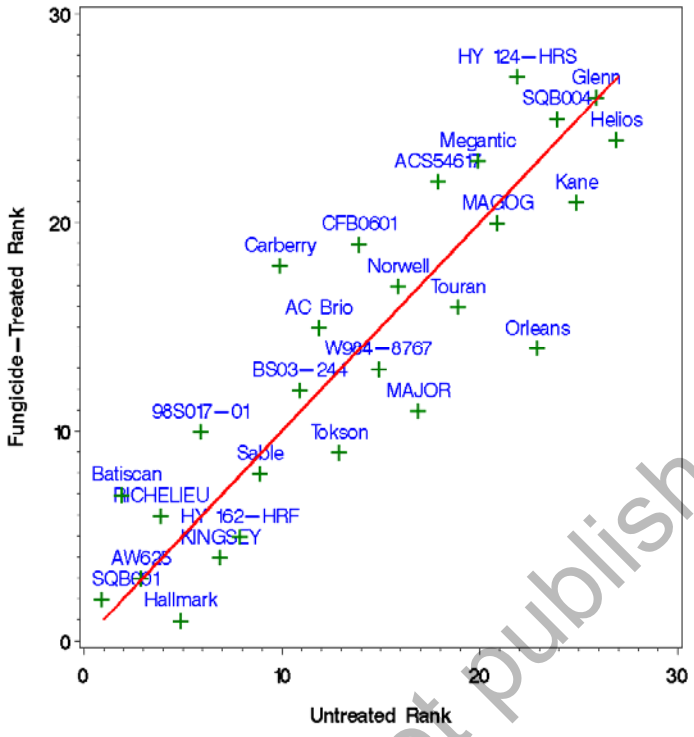


Figure 2c. Rank order of spring wheat varieties from highest to lowest grain yields within fungicide and untreated treatments at New Liskeard, 2010.

Table 10. Managed spring barley performance at Harriston in 2010.

Class	Variety	Yield (t/ha)				Relative Yield Within Fungicide		Test Weight (kg/hL)		Thousand Kernel Weight (g)		Straw Break (0-9)		Net Blotch (0-9)	
		Fungicide		Δ%	p [1]	Fungicide		Fungicide		Fungicide		Fungicide		Fungicide	
		no	yes			no	yes	no	yes	no	yes	no	yes	no	yes
2R	AC Kings	4.11	4.24	3	ns	104	95	66.4	67.2	47.6	50.6	1.7	0.7	7.6	3.9
	AC Parkhill	4.00	4.49	12	ns	101	101	65.9	67.3	46.0	48.1	2.1	2.4	6.7	3.7
	BM9831D-290	4.03	4.34	8	ns	102	98	62.4	62.7	41.3	43.4	1.7	0.9	6.8	2.4
	Bornholm	4.09	4.19	2	ns	103	94	66.9	67.6	43.8	47.7	3.8	0.3	6.7	3.1
	Chief	3.51	4.41	26	**	89	99	58.0	61.7	47.1	49.6	5.2	4.3	7.1	3.8
	Formosa	3.60	4.17	16	*	91	94	64.3	66.9	39.2	45.0	2.8	2.4	7.6	2.9
	Leader	3.42	4.15	21	*	87	94	64.6	66.5	48.8	53.6	0.7	0.7	7.9	4.0
	SC 09B2R	3.44	4.42	28	***	87	100	62.3	63.8	47.5	49.1	0.0	0.6	6.9	2.1
	SC 10B2R	3.72	4.27	15	ns	94	96	63.9	64.5	44.0	47.3	0.7	0.6	7.8	3.2
	T435-036	3.61	4.42	22	**	91	100	66.0	67.4	42.9	44.9	1.9	1.3	8.0	2.1
6R	Alliance	4.24	4.48	6	ns	107	101	64.6	65.6	39.9	41.4	0.0	0.0	5.9	2.4
	Amberly	4.18	4.65	11	ns	106	105	59.4	60.6	47.2	44.9	0.0	0.2	5.4	1.9
	Brucefield	4.40	4.64	5	ns	111	105	60.3	61.2	39.7	43.1	2.0	0.4	6.4	2.1
	C621-013	4.56	4.86	7	ns	115	110	60.9	62.4	45.5	47.4	0.9	0.4	5.0	1.7
	CFO0712	3.80	4.21	11	ns	96	95	65.0	65.7	40.6	42.3	0.4	0.7	7.9	4.7
	Corcy	4.13	4.57	11	ns	105	103	59.7	61.1	40.4	44.9	0.1	0.0	4.8	3.0
	Cyane	4.20	4.40	5	ns	106	99	60.1	61.1	45.7	47.8	1.0	0.3	4.4	2.1
	Dignity	4.48	4.82	8	ns	113	109	63.1	64.0	46.5	45.5	0.0	0.0	4.4	2.3
	HY 101-6R	4.77	4.75	0	ns	121	107	61.1	61.7	46.6	47.0	0.4	0.0	5.8	2.9
	HY 460-6R	4.03	4.32	7	ns	102	97	61.6	62.7	39.5	41.5	0.0	0.0	5.0	1.6
	HY 481-6R	3.61	4.28	19	*	91	96	60.3	61.1	39.2	40.7	0.4	0.0	7.9	2.9
	OAC Cobourg	3.67	3.84	5	ns	93	86	64.1	65.6	40.9	42.9	0.3	0.3	7.1	4.2
	OAC Kawartha	3.50	4.10	17	*	88	92	55.7	58.4	42.7	44.5	2.5	1.3	7.9	4.9
	OAC Laverne	3.36	3.86	15	ns	85	87	65.3	66.2	38.1	40.0	0.3	0.3	5.9	3.3
	OAC Ripley	4.27	4.72	11	ns	108	106	63.2	65.5	41.0	45.3	0.0	0.0	4.4	3.4
	Rhea	3.74	4.41	18	*	94	99	61.5	62.2	40.1	44.8	0.0	0.0	5.3	2.2
	UL108.2	4.28	5.26	23	***	108	118	62.6	63.3	42.9	45.0	0.9	0.1	5.9	2.6
	UL138	3.85	5.13	33	***	97	116	60.1	60.5	39.3	42.8	0.6	0.3	5.8	3.1
	Yielder	4.51	4.87	8	ns	114	110	61.7	63.8	41.0	45.9	0.0	0.3	5.6	3.7
6R[3]	CH9929n-3	3.53	3.85	9	ns	89	87	74.3	76.7	37.1	38.9	2.4	0.1	6.6	1.2
Mean		3.96	4.44	12	*	100	100	62.8	64.2	42.7	45.2	1.1	0.6	6.3	2.9
$LSD_{0.05}$ (within fung)[2]		0.65		-	-	16		-	-	-	-	-	-	-	-

[1]Treated vs untreated contrast; ***,**,*,ns represents statistical significance at p =0.001, 0.01, 0.05, and >0.05, respectively.

[2]LSD = Fisher's Least Significant Difference at p =0.05

[3]hulless

Table 11. Managed spring barley performance at New Liskeard in 2010.

Class	Variety	Yield (t/ha)				Relative Yield Within Fungicide		Test Weight (kg/hL)		Thousand Kernel Weight (g)		Straw Yield (t/ha)	
		Fungicide		Δ%	p [1]	Fungicide		Fungicide		Fungicide		Fungicide	
		no	yes			no	yes	no	yes	no	yes	no	yes
2R	BM9831D-290	5.97	6.47	8	ns	101	100	59.1	58.8	44.1	45.5	6.51	5.98
	Bornholm	5.92	5.92	0	ns	100	92	64.8	65.3	47.0	48.1	5.59	6.26
	T435-031	5.94	6.18	4	ns	101	96	62.6	63.0	45.2	45.7	5.70	6.13
	T435-036	5.79	6.44	11	ns	98	99	61.1	60.8	42.6	44.2	5.37	5.48
6R	AC Alma	5.26	5.90	12	ns	89	91	55.4	55.7	41.3	42.2	4.77	5.34
	Alliance	5.71	6.67	17	*	97	103	58.2	59.1	38.3	40.0	5.04	6.06
	Amberly	5.87	6.87	17	*	99	106	58.5	59.7	44.4	45.5	5.88	7.91
	Brucefield	6.19	6.74	9	ns	105	104	58.5	58.6	39.2	40.1	4.22	4.91
	C621-013	6.14	7.15	16	*	104	111	59.3	59.1	45.5	45.5	5.35	5.34
	CFO0712	6.11	6.59	8	ns	104	102	59.7	58.9	39.2	39.2	4.32	4.35
	Cyane	5.46	5.97	9	ns	93	92	57.5	57.5	45.8	46.9	6.92	6.56
	Encore	6.14	7.24	18	ns	104	112	57.3	57.4	42.2	43.3	6.80	7.57
	HY 101-6R	5.85	5.78	-1	ns	99	89	57.0	56.8	42.4	43.0	3.71	4.49
	HY 460-6R	6.60	7.57	15	*	112	117	59.2	59.8	37.9	39.1	5.32	5.73
	HY 481-6R	6.44	6.82	6	ns	109	105	57.3	57.3	39.1	38.5	4.38	4.70
	Harmony	5.94	6.34	7	ns	101	98	59.7	59.3	45.2	46.3	6.87	7.32
	Oceanik	5.94	7.14	20	*	101	110	56.0	57.5	40.8	42.6	5.68	7.70
	Rhea	6.68	6.85	3	ns	113	106	58.2	59.2	41.1	43.0	6.00	6.91
	Synabelle	5.53	6.13	11	ns	94	95	58.0	58.2	45.1	45.7	4.68	5.20
	Synasolis	5.52	6.19	12	ns	94	96	54.8	55.2	37.2	37.2	6.09	5.27
	UL108.2	6.33	6.14	-3	ns	107	95	59.4	59.9	41.2	42.2	5.76	5.32
	UL138	5.69	5.88	3	ns	96	91	56.3	57.2	41.5	43.4	4.79	6.12
	Yielder	5.58	6.71	20	*	95	104	57.5	57.9	41.9	43.2	5.45	6.57
6R[3]	CH9929n-3	5.01	5.62	12	ns	85	87	58.4	59.1	39.2	39.7	5.48	6.02
Mean		5.90	6.47	10	ns	100	100	58.5	58.8	42.0	42.9	5.44	5.97
$LSD_{0.05}$ (within fung)[2]		0.87		-	-	14		-	-	-	-	-	-

[1]Treated vs untreated contrast; ***,**,*,ns represents statistical significance at p =0.001, 0.01, 0.05, and >0.05,

[2]LSD = Fisher's Least Significant Difference at p =0.05

[3]hulless

Table 12. Managed spring barley performance at Ottawa in 2010.

Class	Variety	Yield (t/ha)				Relative Yield		Test Weight		Thousand	
		Fungicide		Δ%	p [1]	Fungicide		Fungicide		Fungicide	
		no	yes			no	yes	no	yes	no	yes
2R	AC Parkhill	2.41	3.08	28	*	89	95	66.8	67.2	42.0	42.0
	BM9831D-290	2.17	2.70	24	*	80	84	57.1	57.1	37.0	38.0
	Bornholm	2.74	3.56	30	**	101	110	68.2	69.7	43.0	43.0
	Chief	2.26	2.65	17	ns	83	82	59.6	60.5	44.0	43.0
	Leader	2.55	3.12	22	*	94	97	66.3	66.8	45.0	49.0
	SC 10B2R	2.62	2.89	10	ns	96	89	64.5	66.1	39.0	39.0
	T435-031	2.44	3.14	29	**	90	97	66.0	65.7	40.0	41.0
	T435-036	2.36	3.29	39	***	87	102	65.7	66.8	38.0	41.0
6R	Alliance	3.07	3.62	18	*	113	112	65.0	65.1	45.0	36.0
	Amberly	3.09	3.79	23	**	114	117	60.1	60.5	39.0	37.0
	Brucefield	2.48	3.02	22	*	91	94	63.6	64.7	39.0	39.0
	C621-013	2.91	3.28	13	ns	107	102	62.8	64.5	42.0	45.0
	CFO0712	2.25	2.58	15	ns	83	80	63.4	64.7	33.0	33.0
	Corcy	2.58	3.29	28	**	95	102	62.6	63.6	38.0	37.0
	Cyane	2.77	3.46	25	*	102	107	62.8	61.5	41.0	43.0
	Encore	3.07	3.90	27	**	113	121	61.7	62.4	37.0	36.0
	HY 101-6R	2.96	3.22	9	ns	109	100	60.3	60.5	37.0	38.0
	HY 460-6R	2.97	3.73	26	**	109	116	63.8	64.0	37.0	37.0
	HY 481-6R	2.76	2.96	7	ns	102	92	63.4	63.8	38.0	38.0
	Harmony	3.11	3.61	16	ns	114	112	62.2	61.0	37.0	39.0
	OAC Kawartha	2.29	3.24	41	***	84	100	61.7	63.0	41.0	42.0
	OAC Laverne	2.67	2.98	12	ns	98	92	65.7	65.7	34.0	35.0
	OAC Ripley	2.78	2.95	6	ns	102	91	64.2	63.8	37.0	36.0
	Oceanik	2.84	3.33	17	ns	105	103	59.0	58.4	36.0	38.0
	Raquel	2.31	2.99	29	*	85	93	65.5	65.5	40.0	39.0
	Rhea	3.40	3.44	1	ns	125	107	61.5	63.4	39.0	40.0
	Sedna	2.98	3.72	25	**	110	115	60.3	61.7	37.0	38.0
	Synabelle	2.90	3.44	19	*	107	107	64.5	62.4	42.0	42.0
	Synasolis	2.68	3.01	12	ns	98	93	57.0	58.8	36.0	37.0
	UL108.2	2.97	3.28	10	ns	109	102	63.2	63.4	38.0	37.0
	UL138	2.91	3.54	22	*	107	110	61.7	61.0	37.0	37.0
	Yielder	3.10	3.12	1	ns	114	97	61.0	61.7	38.0	40.0
6R[3]	CH9929n-3	2.22	2.61	18	ns	82	81	74.3	74.7	38.0	38.0
Mean		2.72	3.23	19	**	100	100	63.2	63.6	38.9	39.2
$LSD_{0.05}$ (within fung)[2]		0.52		-	-	18		-	-	-	-

[1]Treated vs untreated contrast; ***,**,*,ns represents statistical significance at p =0.001, 0.01, 0.05, and >0.05,

[2]LSD = Fisher's Least Significant Difference at p =0.05

[3]hulless

Table 13. Managed spring barley performance at St. Mary's in 2010.

Class	Variety	Yield				Relative Yield		Test Weight		Thousand		Straw Break		Spot Blotch	
		Fungicide		Δ%	p [1]	Fungicide		Fungicide		Fungicide		Fungicide		Fungicide	
		no	yes			no	yes	no	yes	no	yes	no	yes	no	yes
2R	AC Kings	5.23	5.16	-1	ns	96	96	68.7	69.3	52.1	50.8	4.0	2.8	3.9	5.3
	AC Parkhill	4.89	4.99	2	ns	90	93	69.9	70.9	49.3	49.5	3.5	2.5	5.3	4.3
	BM9831D-290	5.41	4.85	-10	**	99	90	66.0	65.3	41.2	41.4	2.3	3.5	3.0	4.9
	Bornholm	5.03	5.30	5	ns	92	99	69.7	70.5	46.0	47.1	1.3	4.8	5.1	4.2
	Chief	5.55	5.11	-8	*	102	95	64.0	63.3	52.5	48.7	5.8	7.3	3.5	5.4
	Formosa	5.11	4.61	-10	**	94	86	68.4	70.3	45.6	44.6	2.0	5.0	4.6	5.0
	Leader	4.64	4.57	-2	ns	85	85	68.6	69.2	53.2	52.8	1.0	2.5	4.4	4.8
	SC 09B2R	5.22	5.52	6	ns	96	103	69.3	68.4	49.1	49.9	1.5	2.5	5.9	4.8
	SC 10B2R	5.08	4.66	-8	*	93	87	69.7	66.7	46.1	45.3	2.0	4.8	4.2	4.7
	T435-036	5.01	5.43	8	*	92	101	69.3	68.5	44.3	45.7	4.5	1.8	4.4	3.7
6R	Alliance	5.96	5.61	-6	*	109	105	67.0	67.2	40.1	39.6	1.8	5.0	3.0	4.4
	Amberly	5.63	5.55	-1	ns	103	104	63.9	63.4	45.6	46.6	1.5	1.0	3.7	4.8
	Brucefield	5.51	5.97	8	*	101	111	68.0	68.7	40.2	41.5	5.3	2.3	3.7	4.6
	C621-013	6.38	5.56	-13	***	117	104	67.3	68.7	46.2	47.9	3.3	2.3	4.9	4.8
	CFO0712	5.87	4.71	-20	***	108	88	69.0	68.2	39.5	38.6	6.3	8.0	3.1	4.9
	Corcy	5.87	5.45	-7	*	108	102	66.7	66.8	46.3	43.7	2.0	3.3	2.6	5.8
	Cyane	5.89	6.10	4	ns	108	114	65.8	66.6	45.6	45.8	1.8	0.3	3.9	4.1
	Dignity	6.92	6.59	-5	ns	127	123	67.6	67.5	42.8	44.3	1.0	1.8	3.4	2.9
	HY 101-6R	6.56	6.17	-6	*	120	115	69.0	68.2	46.4	44.2	1.8	2.8	4.8	5.3
	HY 460-6R	5.08	5.42	7	ns	93	101	66.0	66.7	41.3	42.1	0.0	0.0	4.3	3.0
	HY 481-6R	5.14	5.25	2	ns	94	98	66.3	67.3	39.7	39.5	5.3	3.3	5.1	3.3
	OAC Cobourg	4.91	4.84	-1	ns	90	90	69.3	70.6	42.9	43.4	2.5	1.3	5.4	3.6
	OAC Kawartha	4.66	5.41	16	***	85	101	62.9	64.9	41.6	44.8	6.5	4.3	7.2	4.4
	OAC Laverne	5.21	5.50	6	ns	96	102	69.4	68.8	41.8	41.1	2.8	3.8	3.7	4.5
	OAC Ripley	4.89	5.26	8	*	90	98	67.2	67.5	39.9	40.5	1.0	1.8	3.1	3.9
	Rhea	6.07	5.40	-11	***	111	101	65.7	63.5	43.6	40.0	1.5	4.0	2.9	6.7
	UL108.2	5.77	6.01	4	ns	106	112	66.3	67.2	41.1	42.5	2.3	1.0	6.6	3.3
	UL138	6.10	6.19	1	ns	112	115	64.0	62.6	41.8	38.9	1.3	1.8	3.8	5.2
	Yielder	5.99	5.94	-1	ns	110	111	66.7	67.4	43.3	45.5	2.0	1.0	2.9	2.8
6R[3]	CH9929n-3	3.95	3.80	-4	ns	72	71	77.5	77.7	37.0	39.6	6.3	3.8	4.6	5.0
Mean		5.45	5.36	-2	ns	100	100	67.7	67.7	44.2	44.2	2.8	3.0	4.2	4.5
$LSD_{0.05}$ (within fung)[2]		0.34		-	-	6		-	-	-	-	-	-	-	-

[1]Treated vs untreated contrast; ***,**,*,ns represents statistical significance at p =0.001, 0.01, 0.05, and >0.05, respectively.

[2]LSD = Fisher's Least Significant Difference at p =0.05

[3]hulless

Table 14. Managed spring barley performance at Winchester in 2010.

Class	Variety	Yield (t/ha)				Relative Yield		Test Weight		Thousand		Straw Yield	
		Fungicide		Δ%	p [1]	Fungicide		Fungicide		Fungicide		Fungicide	
		no	yes			no	yes	no	yes	no	yes	no	yes
2R	AC Parkhill	4.73	5.20	10	ns	101	100	63.1	64.3	46.7	49.0	2.39	2.50
	BM9831D-290	4.61	5.27	14	*	98	101	53.1	53.2	41.5	42.8	2.67	2.86
	Bornholm	4.50	4.86	8	ns	96	94	63.3	64.8	45.7	46.9	2.54	2.18
	Chief	4.70	5.59	19	**	100	108	55.7	58.0	48.5	53.6	2.97	3.05
	Leader	4.96	5.46	10	ns	106	105	62.8	63.4	51.1	51.2	2.43	3.51
	SC 10B2R	4.89	5.26	8	ns	104	101	61.4	62.7	44.5	45.8	2.75	2.61
	T435-031	4.70	5.28	12	ns	100	102	62.6	64.4	46.6	47.1	2.48	2.84
	T435-036	4.95	5.41	9	ns	106	104	62.2	62.8	43.8	42.1	2.83	2.69
6R	Alliance	4.93	5.12	4	ns	105	99	58.7	60.6	39.6	41.2	2.44	3.68
	Amberly	4.63	5.04	9	ns	99	97	54.9	55.8	42.3	43.7	3.11	4.28
	Brucefield	4.79	4.87	2	ns	102	94	57.9	59.6	40.6	41.4	1.66	2.31
	C621-013	5.07	5.37	6	ns	108	103	57.5	59.1	44.9	47.6	2.36	2.61
	CFO0712	4.89	5.47	12	ns	104	105	59.9	61.5	40.9	42.0	1.96	2.36
	Corcy	4.97	5.45	10	ns	106	105	56.5	58.7	44.1	45.6	2.43	3.31
	Cyane	4.49	5.00	11	ns	96	96	56.6	57.5	45.0	47.3	2.54	3.39
	Encore	4.38	4.93	13	ns	93	95	54.3	56.7	37.5	41.5	2.85	2.51
	HY 101-6R	5.07	5.40	7	ns	108	104	54.5	56.5	45.5	45.0	1.93	2.27
	HY 460-6R	4.50	4.83	7	ns	96	93	58.3	59.7	38.6	41.4	2.52	3.18
	HY 481-6R	4.85	5.10	5	ns	103	98	57.3	56.8	40.4	40.1	2.85	3.48
	Harmony	4.83	5.09	5	ns	103	98	55.8	57.6	41.3	46.1	3.30	3.98
	OAC Kawartha	4.49	4.87	8	ns	96	94	53.6	55.4	43.6	42.3	2.62	2.59
	OAC Laverne	4.67	5.34	14	*	100	103	59.3	62.2	39.1	40.9	2.39	3.06
	OAC Ripley	4.96	5.53	11	ns	106	107	58.1	60.1	38.3	40.2	2.68	3.37
	Oceanik	4.50	5.40	20	**	96	104	57.0	58.8	40.1	45.2	2.94	2.97
	Raquel	4.08	5.00	23	**	87	96	59.8	62.0	43.1	45.1	2.45	2.56
	Rhea	4.97	5.19	4	ns	106	100	57.9	59.3	42.6	45.7	2.27	3.53
	Sedna	4.04	5.08	26	**	86	98	52.8	56.4	38.9	42.3	2.06	3.66
	Synabelle	4.81	4.89	2	ns	102	94	57.1	59.1	44.8	48.8	2.55	2.63
	Synasolis	4.83	5.55	15	*	103	107	56.6	57.3	38.1	40.9	2.24	2.88
	UL108.2	5.14	5.61	9	ns	109	108	59.4	61.2	42.1	43.7	2.43	3.94
	UL138	4.50	5.36	19	**	96	103	53.1	57.9	40.5	44.4	2.24	3.41
	Yielder	5.15	5.69	10	ns	110	110	58.3	59.6	42.0	42.3	3.04	3.49
6R[3]	CH9929n-3	3.24	3.80	17	ns	69	73	60.6	66.4	37.9	39.8	2.03	2.81
Mean		4.69	5.19	11	ns	100	100	57.9	59.7	42.4	44.3	2.51	3.04
$LSD_{0.05}$ (within fung)[2]		0.65		-	-	13		-	-	-	-	-	-

[1]Treated vs untreated contrast; ***,**,*,ns represents statistical significance at p =0.001, 0.01, 0.05, and >0.05,

[2]LSD = Fisher's Least Significant Difference at p =0.05

[3]hulless

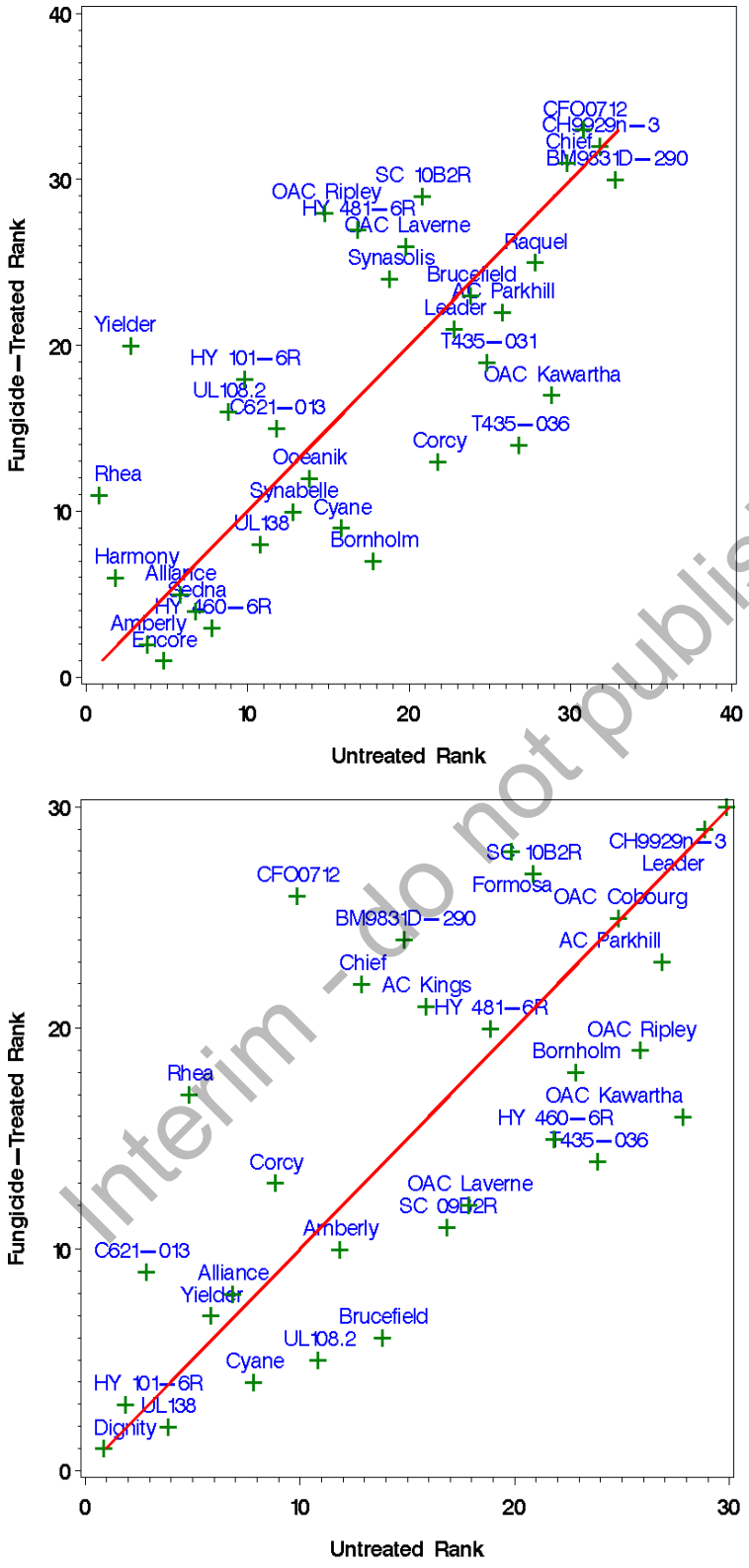


Figure 3a. Rank order of spring barley varieties from highest to lowest grain yields within fungicide and untreated treatments at Ottawa (upper) and St. Mary's (lower), 2010.

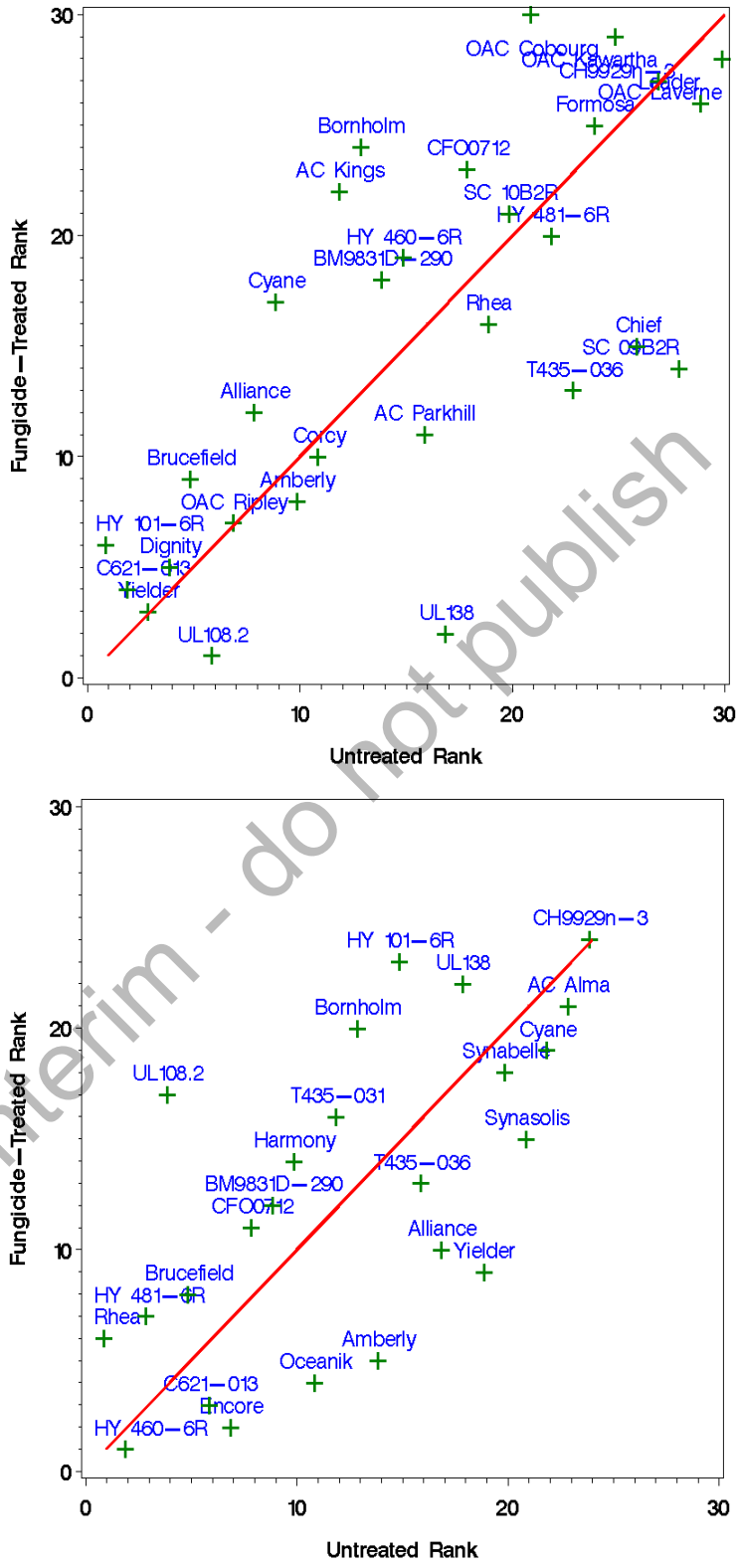


Figure 3b. Rank order of spring barley varieties from highest to lowest grain yields within fungicide and untreated treatments at Harriston (upper) and New Liskeard (lower), 2010.

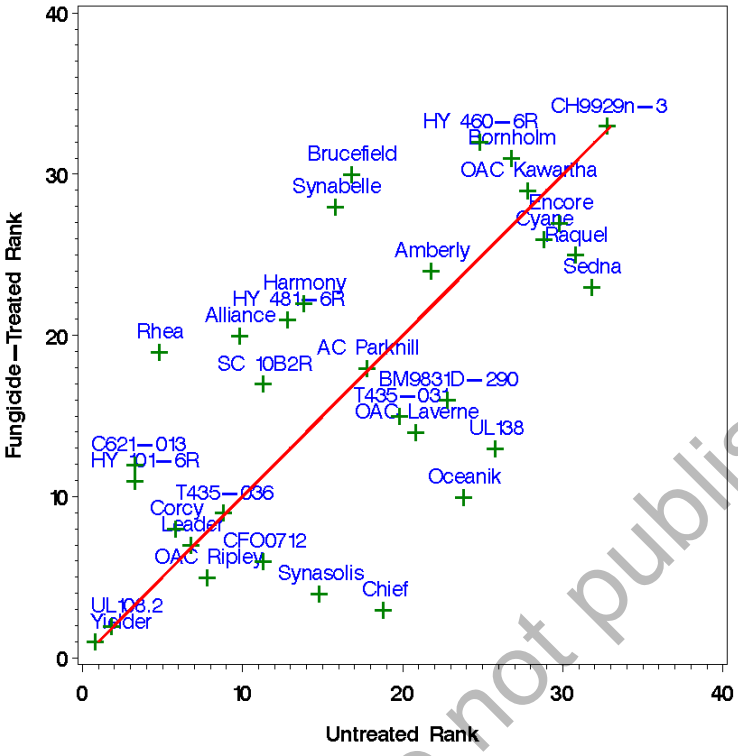


Figure 3c. Rank order of spring barley varieties from highest to lowest grain yields within fungicide and untreated treatments at Winchester, 2010.

Table 15. Managed spring oat performance at Harriston in 2010.

Class[1]	Variety	Yield (t/ha)				Relative Yield Within Fungicide		Test Weight (kg/hL)		Thousand Kernel Weight (g)		Lodging (0-9)		Crown Rust (0-9)		Septoria (0-9)	
		Fungicide		Δ%	p [2]	Fungicide		Fungicide		Fungicide		Fungicide		Fungicide		Fungicide	
		no	yes			no	yes	no	yes	no	yes	no	yes	no	yes	no	yes
HL	AC Gwen	1.61	2.10	30	*	51	60	51.1	50.4	31.3	32.1	3.3	3.1	4.4	2.0	3.0	2.9
	CFA0607	3.03	2.87	-5	ns	95	82	49.6	51.4	25.6	24.3	2.2	0.3	2.3	4.4	1.4	3.2
W	Alcyon	2.88	3.61	25	**	91	103	44.5	45.4	40.9	39.8	6.3	5.0	4.3	1.4	2.1	1.0
	Bailey	3.37	3.48	3	ns	106	99	46.6	47.0	44.3	45.6	6.9	4.4	3.1	1.4	3.1	1.6
	Bradley	3.62	3.50	-3	ns	114	100	44.0	48.6	38.2	44.5	0.6	0.1	1.0	0.1	2.4	1.1
	CFA0908-2	3.59	3.87	8	ns	113	110	45.6	45.2	47.1	44.4	0.3	0.0	3.2	2.2	2.6	1.6
	Lachute	3.30	3.67	11	ns	104	104	40.8	44.4	37.0	39.0	7.6	4.6	4.7	2.0	2.7	2.9
	OA1174-3	3.63	4.10	13	ns	114	117	42.8	44.5	43.0	47.5	4.1	1.9	1.4	2.3	2.0	2.8
	OA1228-1	4.06	4.25	5	ns	128	121	44.5	43.4	39.0	38.2	0.6	0.0	0.0	0.0	3.9	1.1
	OAC Markdale	3.09	3.45	12	ns	97	98	45.1	44.1	37.3	40.0	3.4	3.7	3.3	3.2	1.6	1.0
	Prescott	2.68	3.23	21	*	85	92	43.3	45.6	37.6	39.3	2.2	0.6	5.7	2.0	3.8	2.3
	RC Amaze	3.64	3.70	2	ns	115	105	44.3	45.1	34.9	40.3	7.3	4.7	1.0	3.2	2.0	1.4
	Robust	3.36	3.82	14	ns	106	109	46.8	47.7	36.4	38.4	0.3	0.6	1.1	2.8	2.1	2.8
	Sherwood	2.98	3.30	11	ns	94	94	44.8	43.9	41.5	43.1	4.4	3.8	4.6	3.3	4.1	3.9
Y	Manotick	2.80	3.71	33	***	88	106	40.5	41.7	40.9	41.4	5.3	6.4	5.6	2.4	3.6	1.9
Mean		3.18	3.51	10	ns	100	100	45.0	45.9	38.3	39.9	3.7	2.6	3.1	2.2	2.7	2.1
$LSD_{0.05}$ (within fung)[3]		0.44		-		13		-	-	-	-	-	-	-	-	-	-

[1]HL=Hulless; W=White; Y=Yellow

[2]Treated vs untreated contrast; ***,**,*,ns represents statistical significance at p =0.001, 0.01, 0.05, and

[3]LSD = Fisher's Least Significant Difference at p =0.05

Table 16. Managed spring oat performance at New Liskeard in 2010.

Class[1]	Variety	Yield (t/ha)				Relative Yield Within Fungicide		Test Weight (kg/hL)		Thousand Kernel Weight (g)		Straw Yield (t/ha)	
		Fungicide		Δ%	p [2]	Fungicide		Fungicide		Fungicide		Fungicide	
		no	yes			no	yes	no	yes	no	yes	no	yes
HL	AC Gwen	3.57	3.66	3	ns	76	75	47.0	47.2	38.9	39.2	4.19	5.61
HL	CFA0607	3.60	3.51	-3	ns	77	72	46.4	46.3	32.8	32.9	4.98	6.01
HL	Navaro	3.67	3.55	-3	ns	79	72	53.4	53.5	36.0	36.0	6.11	6.10
W	Alcyon	5.07	5.02	-1	ns	109	103	45.3	45.2	42.6	42.3	4.86	4.92
W	Bailey	4.68	5.29	13	ns	100	108	44.7	45.3	40.0	40.2	3.93	5.18
W	Bia	4.94	4.88	-1	ns	106	100	40.8	40.6	37.6	37.9	4.23	4.68
W	Bradley	4.90	5.28	8	ns	105	108	42.3	43.0	41.6	41.6	4.77	5.00
W	CANTAL	4.38	5.13	17	ns	94	105	45.9	45.6	43.2	43.1	5.28	5.66
W	CFA0908-2	4.77	5.06	6	ns	102	103	42.5	42.4	42.6	42.6	3.59	4.66
W	Canmore	5.24	5.11	-2	ns	112	104	46.2	45.6	44.6	45.1	5.02	5.05
W	Dieter	5.41	5.35	-1	ns	116	109	43.0	42.9	43.1	41.8	4.68	5.56
W	Lachute	4.58	4.93	8	ns	98	101	40.8	40.6	42.2	42.1	4.05	4.71
W	Lois	5.38	5.72	6	ns	115	117	39.6	40.1	45.4	45.6	4.64	5.12
W	OA1174-3	5.09	5.06	-1	ns	109	103	44.0	43.6	43.5	42.7	4.82	4.52
W	OA1228-1	5.27	4.93	-6	ns	113	101	41.6	41.2	34.7	34.1	4.16	4.66
W	Prescott	5.28	5.44	3	ns	113	111	44.9	44.2	38.5	37.7	4.33	5.74
W	RC Amaze	4.14	4.43	7	ns	89	91	43.3	43.3	38.9	37.5	3.41	4.09
W	Robust	4.31	4.50	4	ns	92	92	43.9	44.0	36.2	36.1	2.56	3.29
W	SA04213	4.41	5.16	17	*	94	105	40.2	40.4	36.6	38.1	3.91	3.97
W	Sherwood	4.65	5.05	9	ns	100	103	44.2	44.7	43.9	44.3	5.45	5.69
W	Synextra	4.53	4.88	8	ns	97	100	45.9	46.6	43.4	44.3	4.47	5.18
W	Vitality	4.77	5.21	9	ns	102	106	41.7	41.6	45.8	45.2	5.12	4.84
Y	SO04278	4.74	5.43	15	ns	102	111	44.5	44.3	40.5	39.8	3.84	3.76
Mean		4.67	4.90	5	ns	100	100	44.0	44.0	40.5	40.4	4.45	4.96
$LSD_{0.05}$ (within fung)[3]		0.59		-	-	13		-	-	-	-	-	-

[1]HL=Hulless; W=White; Y=Yellow

[2]Treated vs untreated contrast; ***,**,*,ns represents statistical significance at p =0.001, 0.01, 0.05, and >0.05,

[3]LSD = Fisher's Least Significant Difference at p =0.05

Table 17. Managed spring oat performance in two separate trials (untreated and treated) at Ottawa in 2010.

Class[1]	Variety	Yield (t/ha)				Relative Yield Within Fungicide		Test Weight (kg/hL)		Thousand Kernel Weight (g)		Crown Rust (0-9)	
		Fungicide		Δ%	p[2]	Fungicide		Fungicide		Fungicide		Fungicide	
		no	yes			no	yes	no	yes	no	yes	no	yes
H	AC Gwen	1.93	2.22	15	-	56	57	53.1	53.6	26.3	24.6	1.4	0.0
	CFA0607	2.24	2.80	25	-	64	72	55.0	55.6	23.6	21.8	0.0	0.0
	Navaro	2.34	2.69	15	-	67	70	59.5	59.7	20.3	22.5	0.0	0.0
W	Bailey	3.98	4.53	14	-	113	117	51.8	53.6	36.1	34.7	0.0	0.0
	Bradley	3.61	4.03	12	-	103	104	48.9	52.2	35.2	35.3	0.0	0.0
	CANTAL	4.45	4.51	1	-	127	116	54.0	56.2	37.1	36.0	1.0	0.0
	CFA0908-2	3.34	3.78	13	-	95	98	49.5	51.3	38.5	38.2	0.0	0.0
	Dieter	4.41	4.60	4	-	126	119	50.3	51.8	40.5	39.6	0.6	0.0
	Lachute	3.98	4.29	8	-	113	111	47.3	48.4	34.6	35.0	0.6	0.0
	OA1174-3	3.46	4.00	16	-	99	103	52.5	52.6	38.9	38.7	0.0	0.0
	OA1228-1	3.22	3.79	18	-	92	98	48.7	50.2	32.9	33.0	0.0	0.0
	Prescott	4.38	4.39	0	-	125	113	51.6	53.5	35.0	35.1	1.0	0.0
	RC Amaze	3.18	3.28	3	-	91	85	49.6	49.4	35.7	34.9	0.0	0.0
	Robust	3.16	3.49	10	-	90	90	50.9	53.2	33.8	33.1	0.0	0.0
	SA04213	3.49	4.04	16	-	99	104	45.7	47.4	31.4	33.6	0.0	0.0
	Sherwood	3.88	4.30	11	-	110	111	51.2	52.9	39.9	39.9	0.0	0.0
	Synextra	4.37	4.51	3	-	124	116	54.4	56.5	37.0	37.8	2.5	0.0
	Vitality	3.54	4.24	20	-	101	110	52.2	54.4	40.1	41.1	1.0	0.0
Y	Manotick	3.30	3.61	9	-	94	93	44.9	46.3	36.3	38.4	1.0	0.0
	SO04278	3.55	4.35	23	-	101	112	52.7	47.8	36.0	35.0	0.0	0.0
Mean		3.49	3.87	11	-	100	100	51.2	52.3	34.5	34.4	0.5	0.0
$LSD_{0.05}$ (within fung)[3]		0.53	0.31	-	-	15	8	-	-	-	-	-	-

[1]HL=Hulless; W=White; Y=Yellow

[2]Separate Trials; treated vs untreated contrast not available.

[3]LSD = Fisher's Least Significant Difference at p =0.05

Table 18. Managed spring oat performance at St. Mary's in 2010.

Class[1]	Variety	Yield (t/ha)				Relative Yield Within Fungicide		Test Weight (kg/hL)		Thousand Kernel Weight (g)		Lodging (0-9)		Stem Break (0-9)		Stem Rust (0-9)	
		Fungicide		Δ%	p [2]	Fungicide		Fungicide		Fungicide		Fungicide		Fungicide		Fungicide	
		no	yes			no	yes	no	yes	no	yes	no	yes	no	yes	no	yes
H	AC Gwen	0.19	0.82	332	***	11	30	50.3	56.5	18.8	20.1	7.0	3.0	6.5	2.3	2.6	2.8
	CFA0607	1.71	2.30	35	***	94	85	60.5	59.6	20.3	23.2	2.0	0.3	2.8	0.3	0.8	2.6
W	Alcyon	1.55	2.49	61	***	86	92	39.8	47.2	24.9	27.9	8.0	3.0	7.3	1.5	2.4	2.9
	Bailey	1.76	2.83	61	***	97	105	44.4	51.7	27.7	30.4	8.0	5.0	8.0	5.8	1.4	2.0
	Bradley	2.26	3.13	38	***	125	116	42.2	47.6	29.0	31.2	0.0	0.0	0.8	0.0	1.9	2.3
	CFA0908-2	2.40	2.84	18	***	133	105	46.1	49.6	29.8	34.4	3.0	1.3	3.5	1.3	1.4	1.7
	Lachute	1.48	2.52	70	***	82	93	38.2	46.0	23.8	27.0	8.8	2.3	8.5	2.3	1.8	2.6
	OA1174-3	2.68	3.47	29	***	148	128	47.3	51.9	32.5	34.4	2.5	0.0	3.5	0.0	2.1	2.4
	OA1228-1	3.30	3.65	11	**	182	135	48.6	51.5	24.6	28.1	0.3	0.0	0.0	0.0	0.5	0.9
	OAC Markdale	1.65	2.72	65	***	91	100	43.1	48.7	23.7	27.5	7.3	0.5	8.0	1.0	1.8	1.6
	Prescott	1.29	2.72	111	***	71	101	40.7	50.2	21.7	27.6	8.0	1.8	7.3	2.0	1.7	3.2
	RC Amaze	2.15	2.86	33	***	118	106	47.6	50.3	28.2	29.3	8.0	4.8	8.0	4.3	3.3	2.3
	Robust	2.31	3.15	36	***	127	116	45.1	51.0	24.1	26.5	3.0	0.5	3.0	1.0	2.4	2.6
	Sherwood	1.30	2.17	67	***	72	80	36.0	47.1	24.1	31.2	8.3	4.0	8.0	5.0	2.6	3.1
Y	Manotick	1.14	2.95	159	***	63	109	35.5	45.4	26.1	34.1	6.8	0.3	5.8	1.0	2.1	2.3
Mean		1.81	2.71	50	***	100	100	44.4	50.3	25.3	28.9	5.4	1.8	5.4	1.8	1.9	2.4
$LSD_{0.05}$ (within fung)[3]		0.25				11		-	-	-	-	-	-	-	-	-	-

[1]HL=Hulless; W=White; Y=Yellow

[2]Treated vs untreated contrast; ***,**,*,ns represents statistical significance at p =0.001, 0.01, 0.05, and

[3]LSD = Fisher's Least Significant Difference at p =0.05

Table 19. Managed spring oat performance at Winchester in 2010.

Class[1]	Variety	Yield (t/ha)				Relative Yield Within Fungicide		Test Weight (kg/hL)		Thousand Kernel Weight (g)		Straw Yield (t/ha)	
		Fungicide		Δ%	p [2]	Fungicide		Fungicide		Fungicide		Fungicide	
		no	yes			no	yes	no	yes	no	yes	no	yes
H	AC Gwen	4.42	4.66	5	ns	85	84	53.4	54.9	31.1	33.3	4.06	5.64
	CFA0607	4.44	4.68	5	ns	85	84	55.6	54.4	28.5	28.1	4.71	6.12
	Navaro	4.08	4.32	6	ns	78	77	61.8	60.9	32.1	32.5	5.82	7.34
W	Bailey	5.09	5.20	2	ns	98	93	47.2	48.6	35.9	37.1	2.78	4.19
	Bradley	5.75	5.76	0	ns	111	103	48.6	47.3	38.5	38.5	4.48	6.33
	CANTAL	5.80	6.23	7	ns	112	112	49.8	50.6	38.4	38.8	4.22	5.93
	CFA0908-2	5.75	6.01	5	ns	111	108	47.8	48.3	42.6	41.2	3.54	4.88
	Dieter	5.21	6.06	16	***	100	109	47.0	47.8	38.8	36.0	3.00	4.37
	Lachute	5.15	5.77	12	**	99	103	45.6	46.0	36.5	39.2	2.73	3.64
	OA1174-3	5.32	5.80	9	*	102	104	46.7	45.5	40.8	39.3	3.29	4.45
	OA1228-1	5.86	6.11	4	ns	113	110	47.8	48.6	30.8	31.3	3.49	4.98
	Prescott	5.00	5.53	11	*	96	99	49.9	47.6	33.9	34.4	2.94	3.95
	RC Amaze	4.79	5.27	10	*	92	94	46.5	46.8	35.9	36.5	3.11	4.24
	Robust	5.57	5.76	3	ns	107	103	49.1	49.7	32.9	32.4	3.46	4.58
	SA04213	5.20	5.59	8	ns	100	100	46.0	46.5	34.3	35.4	2.90	3.21
	Sherwood	5.02	5.73	14	**	97	103	46.0	47.5	38.4	41.4	2.61	3.65
	Synextra	5.25	5.90	12	**	101	106	51.9	51.8	37.7	38.9	3.56	5.83
	Vitality	5.55	5.89	6	ns	107	106	47.6	47.3	42.2	41.0	3.37	3.48
Y	Manotick	5.34	5.56	4	ns	103	100	42.9	44.2	40.6	40.6	2.80	3.36
	SO04278	5.39	5.71	6	ns	104	102	50.9	51.9	35.7	38.0	2.70	3.19
Mean		5.20	5.58	7	*	100	100	49.1	49.3	36.3	36.7	3.48	4.67
$LSD_{0.05}$ (within fung)[3]		0.57		-	-	11		-	-	-	-	-	-

[1]HL=Hulless; W=White; Y=Yellow

[2]Treated vs untreated contrast; ***,**,*,ns represents statistical significance at p =0.001, 0.01, 0.05, and >0.05,

[3]LSD = Fisher's Least Significant Difference at p =0.05

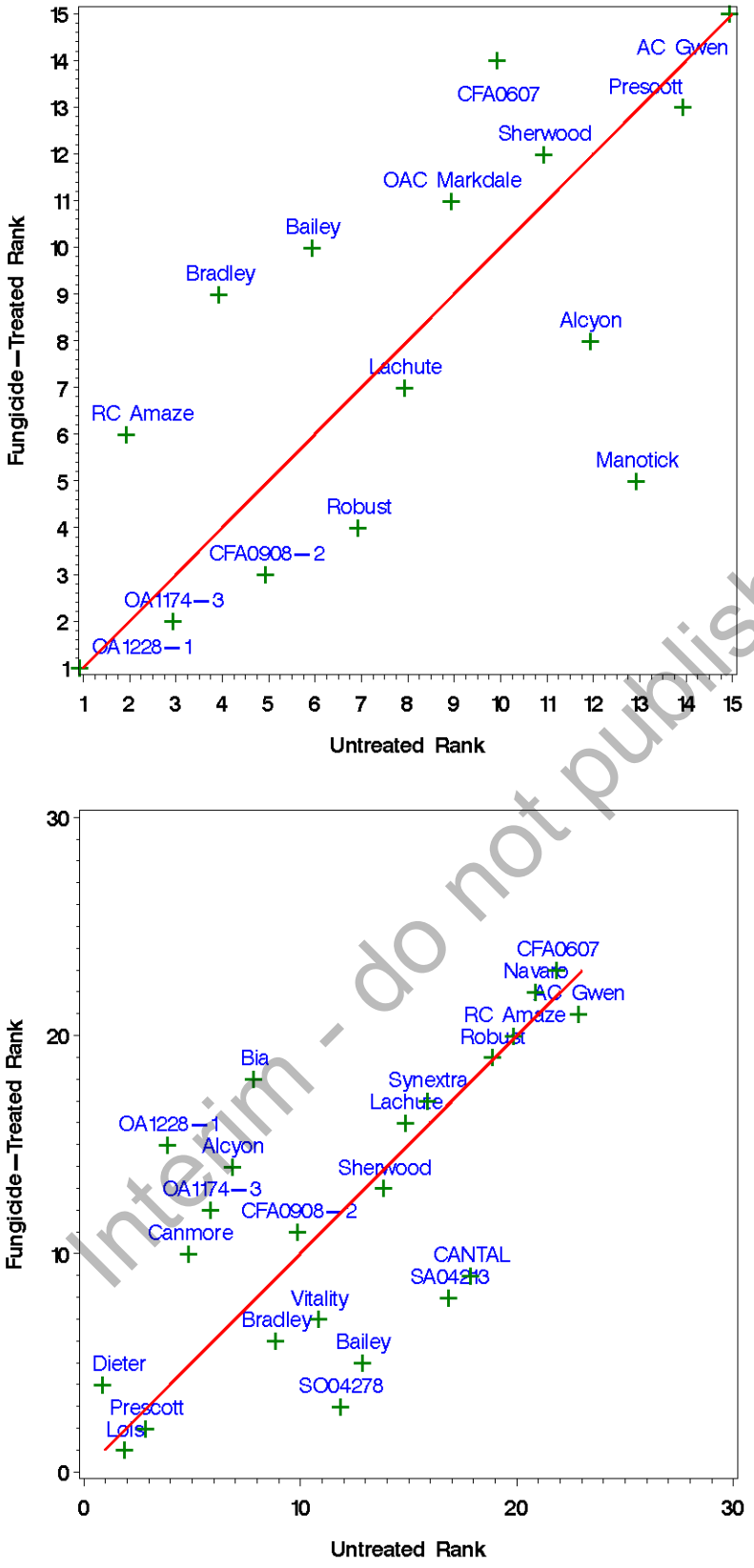


Figure 4a. Rank order of spring oat varieties from highest to lowest grain yields within fungicide and untreated treatments at Harriston (upper) and New Liskeard (lower), 2010.

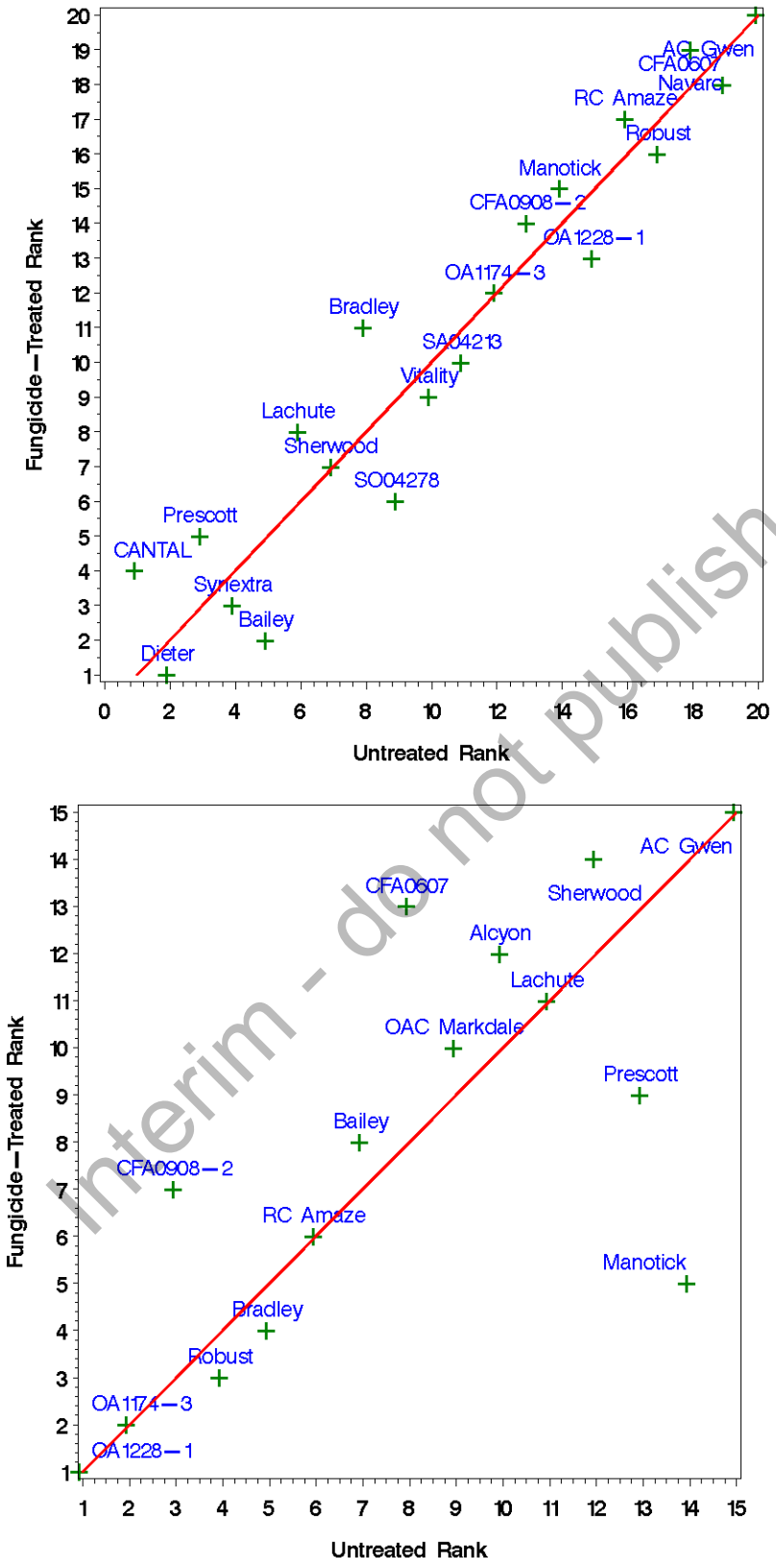


Figure 4b. Rank order of spring oat varieties from highest to lowest grain yields within fungicide and untreated treatments at Ottawa (upper) and St. Mary's (lower), 2010.

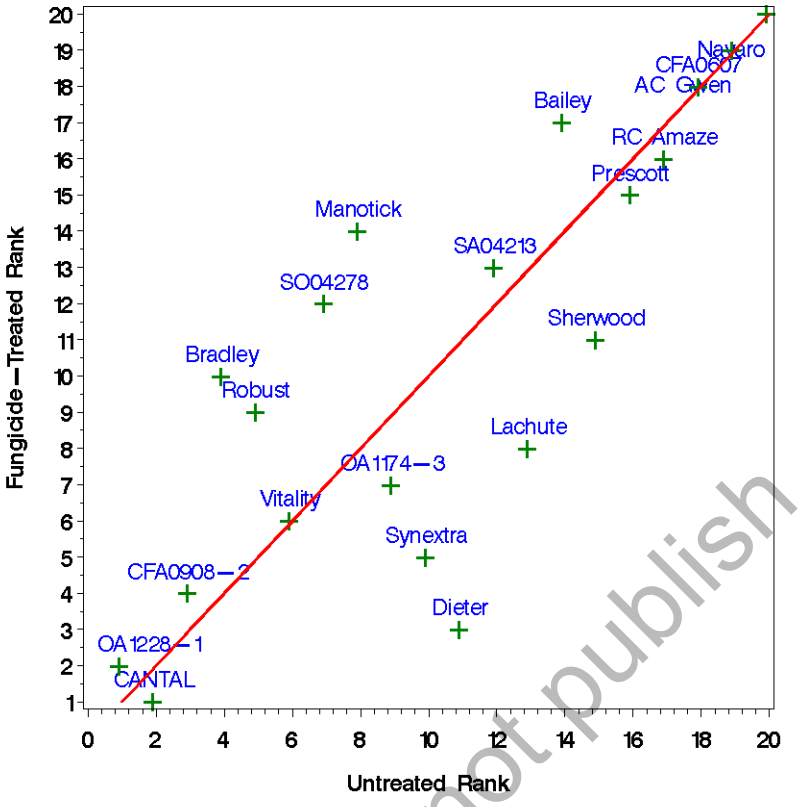


Figure 4c. Rank order of spring oat varieties from highest to lowest grain yields within fungicide and untreated treatments at Winchester, 2010.