SASKATCHEWAN ON-FARM RESEARCH TRIALS 2023

WHEAT WISE
Plotting the Future

by Sask Wheat
DEVELOPMENT COMMISSION

Overview

During the 2022 growing season, Sask Wheat launched its "On-Farm Trial" program now branded to "Wheat Wise – Plotting the Future". Through this program, producers have the opportunity to work alongside Sask Wheat, their agronomist and research experts while implementing field-scale trials under their farm conditions and management practices to get results that matter to their farm.

The overall goal of the program is to build an on-farm research network which is led and used by producers. This will allow producers to fine-tune recommendations for their specific farm conditions and assist with future management decisions. Although the work is collective, the end goal remains the same: maximize wheat yield, quality and economic return.

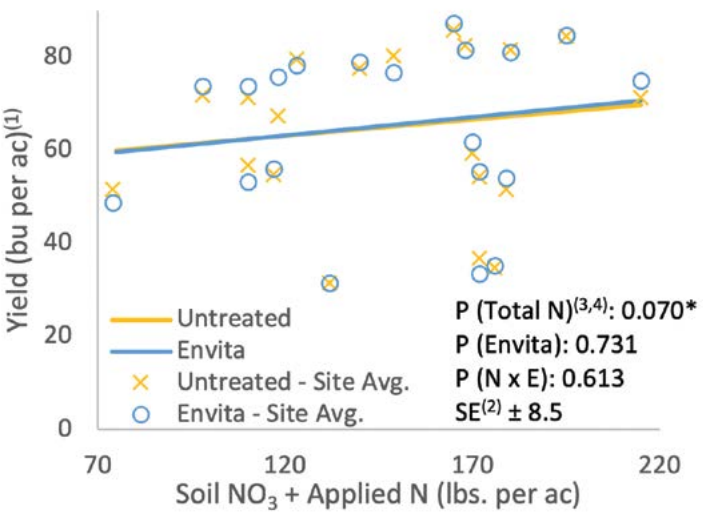
The inaugural year of trials examined wheat seeding rates while 2023 looked at biological nitrogen fixation products on wheat. Moving forward, Sask Wheat is excited to continue to listen to producer interests and offer a variety of protocols while we continue to expand the program around the province.

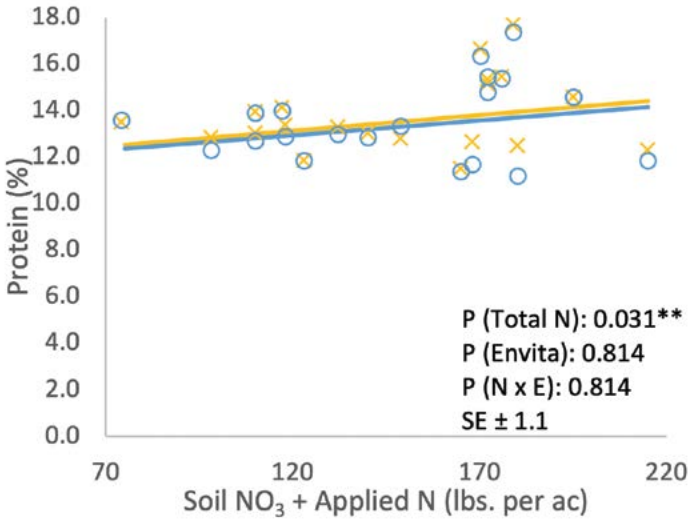
Protocol: Foliar-Applied Nitrogen-Fixing Biological Products For Wheat

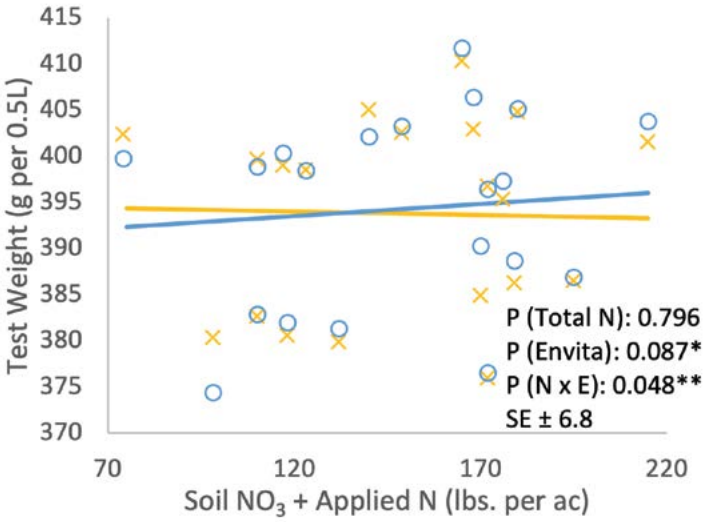
Foliar-Applied Nitrogen-Fixing Biological Products For Wheat: Results Summary

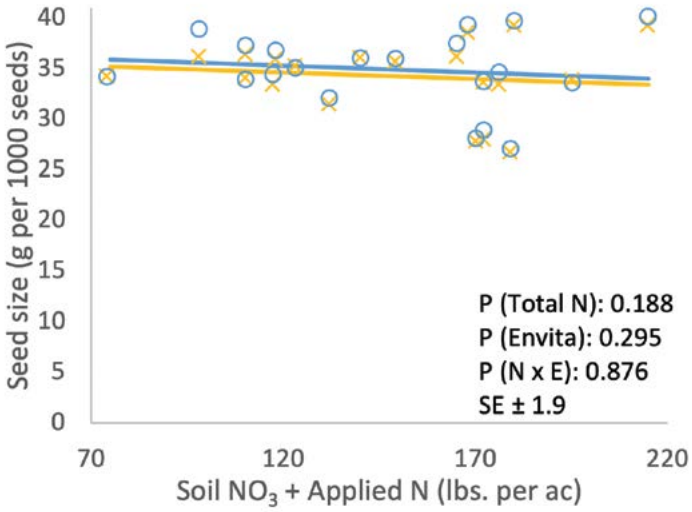
Data from all sites was combined to assess the overall effect of Envita® application and whether the effect differed with nitrogen (N) availability. The amount of applied N was added to the soil residual NO_{3-} to estimate N supply for different sites and treatments.

Overall, we were unable to detect a significant difference in yield in response to Envita® application under the conditions experienced across the trials this growing season, however N supply may have had a positive effect on yield (P<0.1). Protein increased significantly with N supply (P<0.05) but was not significantly affected by Envita® application. The effect of N supply on test weight differed when Envita® was applied (P<0.05); test weight was unaffected by N supply when untreated, but increased with N supply when Envita® was applied. Seed size was not significantly affected by Envita® application or N supply overall.









Individual site reports are provided to indicate the variability in management, environmental conditions, and responses to N supply and Envita® application that was observed across trial sites this growing season. The 2024 suggested retail price (SRP) of Envita® is $16.48 per acre.

The following footnotes will also be referred to in the individual site reports for this protocol:

1. Yields were adjusted to 14.5% seed moisture content
2. SE is the standard error which is in the same unit as the measurement and indicates the level of variability or uncertainty in the data.
3. The P-value indicates the statistical significance, or likelihood that the measured difference was a result of the treatment:
   P < 0.01 = Very likely; Very high probability that the difference was due to the treatment (***)
   P < 0.05 = Likely; Good probability that the difference was due to the treatment (**)
   P < 0.1 = Possibly; Moderate probability that the difference was due to the treatment (*)
   P > 0.1 = Not likely; Probability too low to confirm if the difference was due to the treatment (not significant)
   ** Where P < 0.05, treatment differences are shown in summary figures.
4. P-value (N rate) indicates the likelihood of a difference resulting from N rate treatments only;
   P-value (Envita®) indicates the likelihood of a difference resulting from Envita® application only;
   P-value (N x E) indicates the likelihood of N rate treatments having different responses to Envita® application

WHEAT WISE
Plotting the Future

Foliar-Applied Nitrogen-Fixing Biological Products In Spring Wheat (Balgonie)

Objective: To determine if there are agronomic and economic benefits of applying a commercially available, foliar-applied N-fixing bacteria product (Envita®) in wheat.

Treatments:
1. Untreated check
2. Envita® application

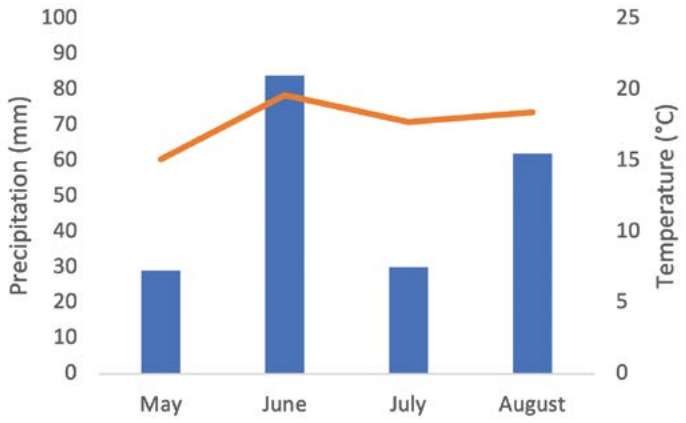
Replicates: Four

General Trial Information:	
Variety	AAC Wheatland VB
Seeding date	May 13
Previous crop	Canola
Soil organic matter	2.7%
Residual Nitrate-N (0-12")	28 lbs N ac^{-1}
Applied N	80 lbs N ac^{-1} Fall-applied + 57 lbs N ac^{-1} at seeding
Plant density / Row spacing	20 plants ft^{-2} on 10" spacing

Envita® Application:	
Date / Time	June 9 at 4:00 p.m.
Crop stage	4-5 leaf
Tank mix	No
Water volume	10 gal ac^{-1}
Weather conditions	Sunny, 23°C

In-crop pesticide applications:	
June 8	Manipulator + Simplicity + Stellar XL
July 3	Miravis Ace + Keysal 90

Weather: *Climate FieldView (precip) + Qu'Appelle 1 EC weather station (temp)*



Results:

Treatment	Yield [1] (lbs ac^{-1} / bu ac^{-1})	Protein (%)	Test weight (g 0.5L^{-1})	Seed size (g 1000 seeds^{-1})
Check	4592 (76.5)	11.5	410	36.3
Envita®	4677 (77.9)	11.4	412	37.6
SE [2]	± 63 (1.0)	± 0.3	± 0.7	± 0.9
P-value [3]	*0.27*	*0.73*	*0.14*	*0.21*

Summary:
We were unable to detect differences in yield or grain quality as a result of the application of Envita® foliar-applied N-fixing bacteria to spring wheat under these trial conditions.

Economics:
There was no significant difference in yield between treatments. Therefore, the most economical treatment is the check.

To review footnote references please refer to overall trial summary on page 103.

This trial was conducted with the agronomic support of

CORE AG INPUTS **in White Butte**

WHEAT WISE
Plotting the Future

Foliar-Applied Nitrogen-Fixing Biological Products In Spring Wheat (Craik)

Objective: To determine if there are agronomic and economic benefits of applying a commercially available, foliar-applied N-fixing bacteria product (Envita®) in wheat under varying rates of applied N fertilizer.

Treatments:

1. Normal N rate – Untreated
2. Normal N rate + Envita®
3. Reduced N rate – Untreated
4. Reduced N rate + Envita®

Replicates: Three

General Trial Information:

Variety	AAC Viewfield	
Seeding date	May 29	
Previous crop	Canola	
Soil organic matter	2.8%	
Residual Nitrate-N (0-24")	89 lbs ac^{-1}	
Applied N	UAN sideband	90 lbs N ac^{-1} (Normal) 81 lbs N ac^{-1} (Reduced)
Plant density / Row spacing	24 plants ft^{-2} on 12" spacing	

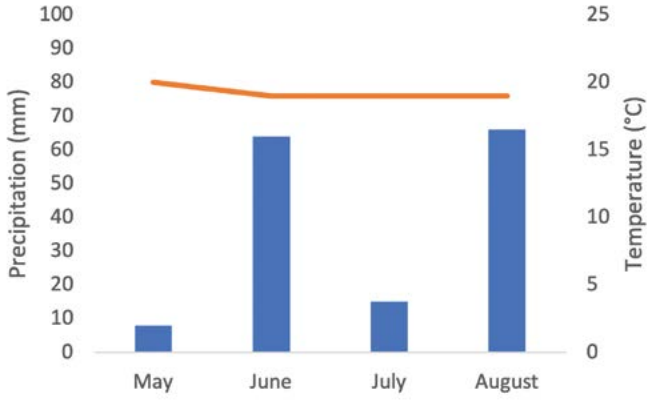
Envita® Application:

Date / Time	June 30 at 7:30 a.m.
Crop stage	5 leaf on main stem
Tank mix	HiActivate
Water volume	15 gal ac^{-1}
Weather conditions	Clear skies, 20°C

In-crop pesticide applications:

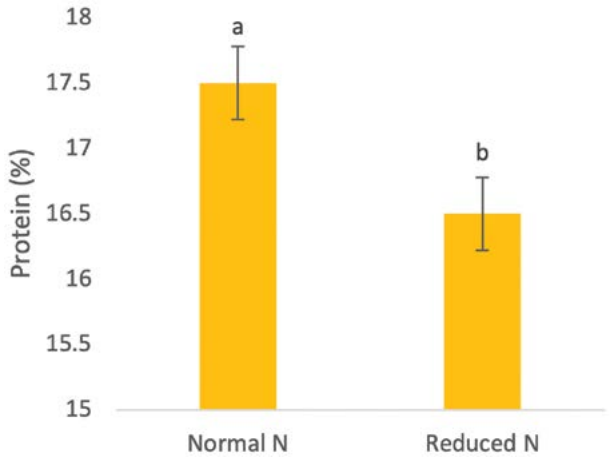
June 26	Horizon + Barricade II

Weather: *In-field or nearby weather station*



Results:

Treatment	Yield [1] (lbs ac^{-1} / bu ac^{-1})	Protein (%)	Test weight (g 0.5L^{-1})	Seed size (g 1000 seeds^{-1})
Normal N Check	1239 (20.6)	17.7	386	26.8
Normal N + Envita®	1295 (21.6)	17.4	389	27.2
Reduced N Check	1422 (23.7)	16.7	385	27.9
Reduced N + Envita®	1485 (24.8)	16.4	390	28.2
SE [2]	± 94 (1.6)	± 0.40	± 3.0	± 0.53
P-value (N rate) [3]	*0.08**	*0.04***	*0.97*	*0.08**
P-value (Envita®)	*0.53*	*0.48*	*0.23*	*0.52*
P-value (N x E) [4]	*0.97*	*0.98*	*0.65*	*0.90*



The effect of applied N rate on wheat protein content at Craik. Treatments labeled with the same letter are not significantly different.

Summary:
Protein content was significantly lower (P<0.05) with the reduced N-rate compared to the normal rate N. Rate may have also influenced yield and seed size. However, there were no differences in yield or grain quality of spring wheat resulting from application of Envita® foliar-applied N-fixing bacteria, regardless of applied N rate, under these trial conditions.

Economics:
There was no significant difference in yield resulting from Envita® application, regardless of applied N rate. Therefore, the most economical treatment in regard to Envita® application is the check.

To review footnote references please refer to overall trial summary on page 103.

This trial was conducted with the agronomic support of

Sask Wheat DEVELOPMENT COMMISSION

WHEAT WISE
Plotting the Future

Foliar-Applied Nitrogen-Fixing Biological Products In Spring Wheat (Cutknife)

Objective: To determine if there are agronomic and economic benefits of applying a commercially available, foliar-applied N-fixing bacteria product (Envita®) in wheat under varying rates of applied N fertilizer.

Treatments:

1. Normal N rate – Untreated
2. Normal N rate + Envita®
3. Reduced N rate – Untreated
4. Reduced N rate + Envita®

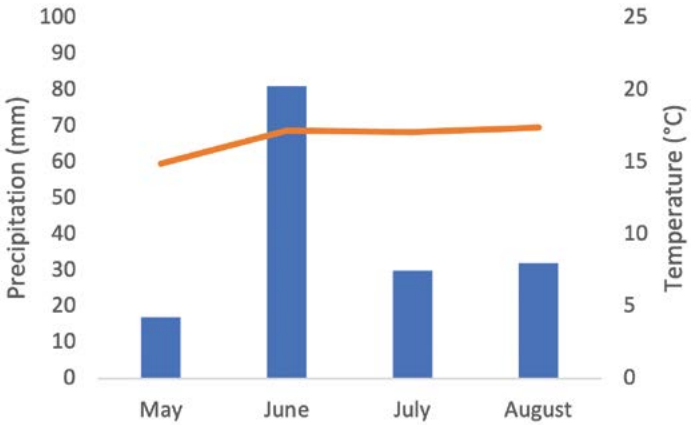
Replicates: Three

General Trial Information:		
Variety	AAC Wheatland VB	
Seeding date	May 14	
Previous crop	Wheat	
Soil organic matter	4.7%	
Residual Nitrate-N (0-24")	55 lbs ac^{-1}	
Applied N	UAN with seed	94 lbs N ac^{-1} (Normal) 85 lbs N ac^{-1} (Reduced)
Plant density / Row spacing	23 plants ft^{-2} on 12" spacing	

Envita® Application:	
Date / Time	June 1 at mid-morning
Crop stage	3 leaf
Tank mix	No
Water volume	10 gal ac^{-1}
Weather conditions	Warm morning, hot afternoon

In-crop pesticide applications:	
June 12	Velocity
June 30	Prosaro

Weather: *Scott CDA EC weather station*



Results:

Treatment	Yield [1] (lbs ac^{-1} / bu ac^{-1})	Protein (%)	Test weight (g 0.5L^{-1})	Seed size (g 1000 seeds^{-1})
Normal N Check	4296 (71.6)	12.8	403	35.7
Normal N + Envita®	4109 (68.5)	13.3	403	36.1
Reduced N Check	4158 (69.3)	13.1	405	36.2
Reduced N + Envita®	4230 (70.5)	12.9	402	36.2
SE [2]	± 93 (1.5)	± 0.45	± 2.1	± 0.7
P-value (N rate) [3]	*0.89*	*0.79*	*0.60*	*0.70*
P-value (Envita®)	*0.36*	*0.71*	*0.39*	*0.81*
P-value (N x E) [4]	*0.06**	*0.47*	*0.19*	*0.82*

Summary:
There is a moderate probability that the yield response to Envita® application may have been influenced by N rate (P<0.1). The results suggest that under these trial conditions, Envita® application may have reduced yield at the normal N rate but did not affect yield at the reduced N rate. Grain quality was not affected by either N rate or Envita® application.

Economics:
There was no significant difference in yield resulting from Envita® application, regardless of applied N rate. Therefore, the most economical treatment in regard to Envita® application is the check

To review footnote references please refer to overall trial summary on page 103.

This trial was conducted with the agronomic support of

Sask Wheat DEVELOPMENT COMMISSION

WHEAT WISE
Plotting the Future

Foliar-Applied Nitrogen-Fixing Biological Products In Spring Wheat (Davidson)

Objective: To determine if there are agronomic and economic benefits of applying a commercially available, foliar-applied N-fixing bacteria product (Envita®) in wheat under varying rates of applied N fertilizer.

Treatments:

1. Normal N rate – Untreated
2. Normal N rate + Envita®
3. Reduced N rate – Untreated
4. Reduced N rate + Envita®
5. Low N rate – Untreated
6. Low N rate + Envita®

Replicates: Three

General Trial Information:

Variety	AAC Hodge VB	
Seeding date	May 2	
Previous crop	Canola	
Soil organic matter	3.0%	
Residual Nitrate-N (0-24")	40 lbs ac^{-1}	
Applied N	Granular side-band	77 lbs N ac^{-1} (Normal) 70 lbs N ac^{-1} (Reduced) 34 lbs N ac^{-1} (Low)
Plant density / Row spacing	23 plants ft^{-2} on 12" spacing	

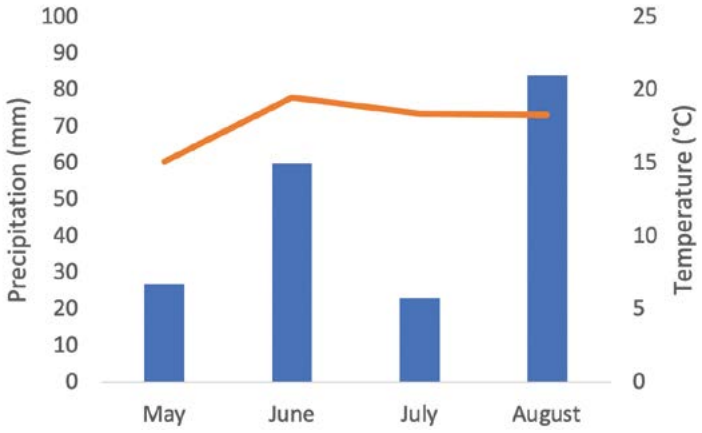
Envita® Application:

Date / Time	June 5
Crop stage	5-6 leaf, 2-3 tillers
Tank mix	No
Water volume	14.5 gal ac^{-1}
Weather conditions	Sunny, 25°C

In-crop pesticide applications:

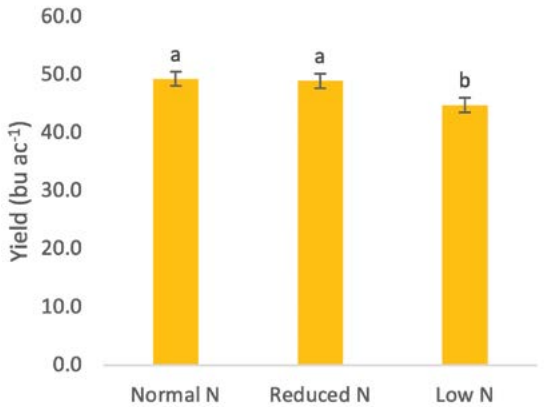
May 22	OnDeck + Horizon
June 7	2,4-D

Weather: *in-field weather station*



Results:

Treatment	Yield [1] (lbs ac^{-1} / bu ac^{-1})	Protein (%)	Test weight (g 0.5L^{-1})	Seed size (g 1000 seeds^{-1})
Normal N Check	2930 (48.8)	14.1	399	33.5
Normal N + Envita®	2997 (50.0)	14.0	400	34.5
Reduced N Check	3040 (50.7)	14.0	400	34.1
Reduced N + Envita®	2847 (47.5)	13.9	399	34.0
Low N Check	2769 (46.1)	13.5	402	34.4
Low N + Envita®	2612 (43.5)	13.6	400	34.3
SE [2]	± 106 (1.8)	± 0.45	± 2.3	± 0.71
P-value (N rate) [3]	*0.04***	*0.44*	*0.68*	*0.87*
P-value (Envita®)	*0.30*	*0.96*	*0.71*	*0.63*
P-value (N x E) [4]	*0.44*	*0.97*	*0.66*	*0.66*



The effect of applied N rate on wheat yield at Davidson. Treatments labeled with the same letter are not significantly different.

Summary:
Yield was significantly lower with the low N rate compared to the normal and reduced N rates. We were unable to detect a difference in yield as a result of the application of Envita® foliar-applied N-fixing bacteria to spring wheat, regardless of N rate. Grain quality was not affected by either N rate or Envita® application.

Economics:
There was no significant difference in yield resulting from Envita® application, regardless of applied N rate. Therefore, the most economical treatment in regard to Envita® application is the check.

To review footnote references please refer to overall trial summary on page 103.

This trial was conducted with the agronomic support of

WAgS
WARKENTIN AG SERVICES

WHEAT WISE
Plotting the Future

Foliar-Applied Nitrogen-Fixing Biological Products In Spring Wheat (Delisle)

Objective: To determine if there are agronomic and economic benefits of applying a commercially available, foliar-applied N-fixing bacteria product (Envita®) in wheat.

Treatments:
1. Untreated check
2. Envita® application

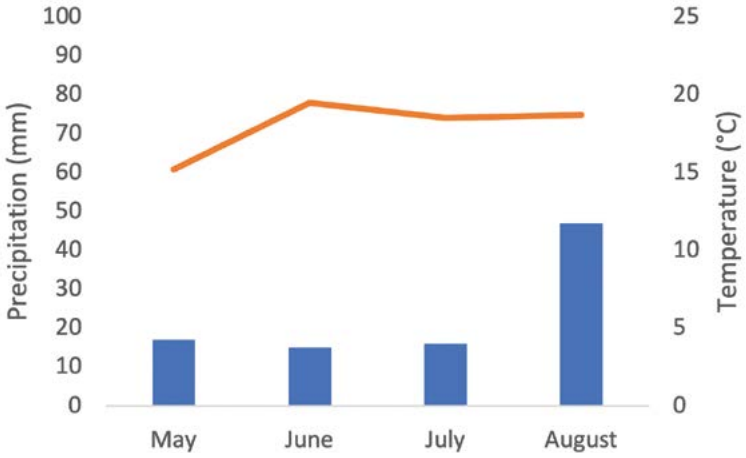
Replicates: Three

General Trial Information:	
Variety	AAC Starbuck VB
Seeding date	May 6
Previous crop	Lentil
Soil organic matter	3.4%
Residual Nitrate-N (0-24")	67 lbs N ac^{-1}
Applied N	105 lbs N ac^{-1} mid-row band urea in a granular blend
Plant density / Row spacing	24 plants ft^{-2} on 10" spacing

Envita® Application:	
Date / Time	June 6 at 6:20 p.m.
Crop stage	4 leaf, 2 tillers
Tank mix	Thumper + Axial
Water volume	10 gal ac^{-1}
Weather conditions	23°C

In-crop pesticide applications:	
June 6	Thumper + Axial

Weather: *Outlook EC station*



Results:

Treatment	Yield [1] (lbs ac^{-1} / bu ac^{-1})	Protein (%)	Test weight (g 0.5L^{-1})	Seed size (g 1000 seeds^{-1})
Check	3005 (50.1)	15.1	377.0	28.3
Envita®	2969 (49.5)	14.8	376.5	29.0
SE [2]	± 155 (2.6)	± 0.21	± 2.4	± 0.60
P-value [3]	*0.69*	*0.36*	*0.54*	*0.40*

Summary:
We were unable to detect differences in yield or grain quality as a result of the application of Envita® foliar-applied N-fixing bacteria to spring wheat under these trial conditions.

Economics:
There was no significant difference in yield between treatments. Therefore, the most economical treatment is the check.

To review footnote references please refer to overall trial summary on page 103.

This trial was conducted with the agronomic support of

Sask Wheat DEVELOPMENT COMMISSION

WHEAT WISE
Plotting the Future

Foliar-Applied Nitrogen-Fixing Biological Products In Spring Wheat (Hepburn)

Objective: To determine if there are agronomic and economic benefits of applying a commercially available, foliar-applied N-fixing bacteria product (Envita®) in wheat under varying rates of applied N fertilizer.

Treatments:

1. Normal N rate – Untreated
2. Normal N rate + Envita®
3. Reduced N rate – Untreated
4. Reduced N rate + Envita®

Replicates: Three

General Trial Information:

Variety	AAC Starbuck VB	
Seeding date	May 13	
Previous crop	Canola	
Soil organic matter	5.1%	
Residual Nitrate-N (0-24")	141 lbs ac^{-1}	
Applied N	70 Urea:30 ESN + granular blend	80 lbs N ac^{-1} (Normal) 74 lbs N ac^{-1} (Reduced)
Plant density / Row spacing	26 plants ft^{-2} on 12" spacing	

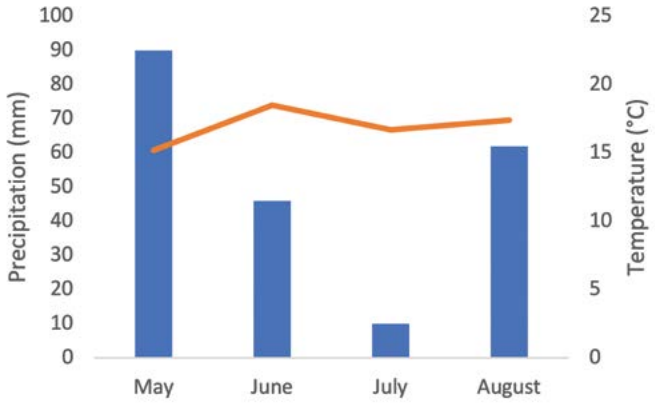
Envita® Application:

Date / Time	June 7
Crop stage	3 leaf
Tank mix	No
Water volume	20 gal ac^{-1}
Weather conditions	20-23°C, ~40% RH

In-crop pesticide applications:

June 6	Simplicity GoDri + Stellar

Weather: *In-field and nearby weather station*



Results:

Treatment	Yield [1] (lbs ac^{-1} / bu ac^{-1})	Protein (%)	Test weight (g 0.5L^{-1})	Seed size (g 1000 seeds^{-1})
Normal N Check	4190 (69.8)	11.8	403	39.2
Normal N + Envita®	4177 (69.6)	12.0	405	40.3
Reduced N Check	3817 (63.6)	12.3	402	39.3
Reduced N + Envita®	4017 (66.9)	11.9	404	40.3
SE [2]	± 128 (2.1)	± 0.43	± 1.8	± 0.48
P-value (N rate) [3]	*0.07**	*0.63*	*0.51*	*0.96*
P-value (Envita®)	*0.49*	*0.80*	*0.25*	*0.09**
P-value (N x E) [4]	*0.43*	*0.49*	*0.90*	*0.90*

Summary:
There is a moderate probability that yield was lower with the reduced N rate compared to the normal N rate (P<0.1). There was no significant difference in yield as a result of the application of Envita® foliar-applied N-fixing bacteria to spring wheat, regardless of N rate. Grain quality was not affected by N rate. There was also a moderate probability that increased seed size was a result of Envita® application (P<0.1). Protein and test weight were not affected by Envita® application.

Economics:
There was no significant difference in yield resulting from Envita® application, regardless of applied N rate. Therefore, the most economical treatment in regard to Envita® application is the check.

To review footnote references please refer to overall trial summary on page 103.

This trial was conducted with the agronomic support of

CO-OP® LAKE COUNTRY

WHEAT WISE
Plotting the Future

Foliar-Applied Nitrogen-Fixing Biological Products In Spring Wheat
(Indian Head - IHARF)

Objective: To determine if there are agronomic and economic benefits of applying a commercially available, foliar-applied N-fixing bacteria product (Envita®) in wheat.

Treatments:
1. Untreated check
2. Envita® application

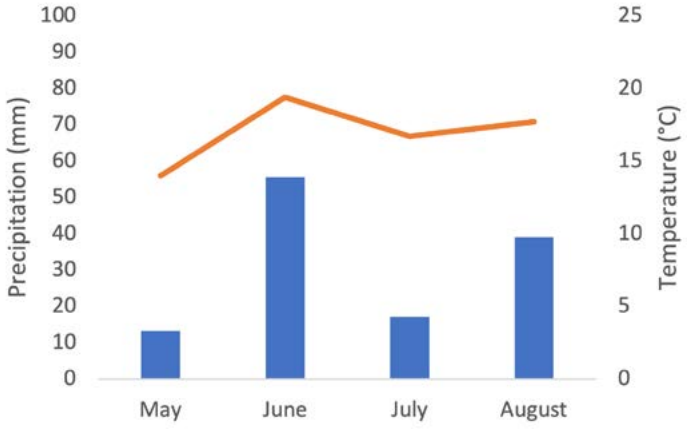
Replicates: Four

General Trial Information:	
Variety	AAC Wheatland VB
Seeding date	May 14
Previous crop	Canola
Soil organic matter	5.2%
Residual Nitrate-N (0-24")	13 lbs ac^{-1}
Applied N	110 lbs. ac^{-1}
Plant density / Row spacing	25-30 plants ft^{-2} on 12" spacing

Envita® Application:	
Date / Time	June 19
Crop stage	5.5 leaf
Tank mix	Agral 90
Water volume	13 gal ac^{-1}
Weather conditions	Light rain overnight, Max 23°C, Daytime RH 43-68%

In-crop pesticide applications:	
June 10	Varro + OcTTain XL + Ammonium sulfate
July 5	Prosaro Pro

Weather: *In-field precip + Environment Canada Temps (Indian Head CDA)*



Results:

Treatment	Yield [1] (lbs ac^{-1} / bu ac^{-1})	Protein (%)	Test weight (g 0.5L^{-1})	Seed size (g 1000 seeds^{-1})
Check	4258 (71.0)	11.9	398.6	35.3
Envita®	4195 (69.9)	11.9	398.5	35.1
SE [2]	± 54 (0.9)	± 0.1	± 0.8	± 0.2
P-value [3]	*0.19*	*0.75*	*0.87*	*0.64*

Summary:
We were unable to detect differences in yield or grain quality as a result of the application of Envita® foliar-applied N-fixing bacteria to spring wheat under these trial conditions.

Economics:
There was no significant difference in yield between treatments. Therefore, the most economical treatment is the check.

To review footnote references please refer to overall trial summary on page 103.

This trial was conducted with the agronomic support of

IHARF INDIAN HEAD AGRICULTURAL RESEARCH FOUNDATION

and AAFC Indian head

WHEAT WISE
Plotting the Future

Foliar-Applied Nitrogen-Fixing Biological Products In Spring Wheat
(Indian Head)

Objective: To determine if there are agronomic and economic benefits of applying a commercially available, foliar-applied N-fixing bacteria product (Envita®) in wheat.

Treatments:
1. Untreated check
2. Envita® application

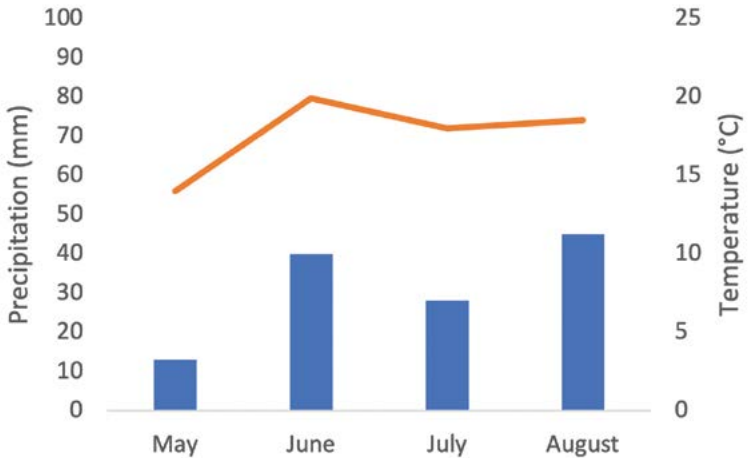
Replicates: Four

General Trial Information:	
Variety	AAC Elie
Seeding date	May 14
Previous crop	Lentil
Soil organic matter	3.0%
Residual Nitrate-N (0-24")	74 lbs N ac^{-1}
Applied N	121 lbs N ac^{-1} urea side-band
Plant density / Row spacing	28 plants ft^{-2} on 7" spacing

Envita® Application:	
Date / Time	June 15 at 8:00 a.m.
Crop stage	Tiller
Tank mix	Agral 90
Water volume	10 gal ac^{-1}
Weather conditions	High humidity, 16°C

In-crop pesticide applications:	
June 9	Varro + MCPA + Audible
July 5	Prosaro Pro (Aerial)

Weather: *In-field weather station*



Results:

Treatment	Yield [1] (lbs ac^{-1} / bu ac^{-1})	Protein (%)	Test weight (g 0.5L^{-1})	Seed size (g 1000 seeds^{-1})
Check	4529 (75.5)	14.6	386.5	33.9
Envita®	4540 (75.7)	14.6	387.0	33.7
SE [2]	± 71 (1.2)	± 0.1	± 0.9	± 0.5
P-value [3]	*0.92*	*0.64*	*0.68*	*0.73*

Summary:
We were unable to detect differences in yield or grain quality as a result of the application of Envita® foliar-applied N-fixing bacteria to spring wheat under these trial conditions.

Economics:
There was no significant difference in yield between treatments. Therefore, the most economical treatment is the check.

To review footnote references please refer to overall trial summary on page 103.

This trial was conducted with the agronomic support of

IHARF
INDIAN HEAD AGRICULTURAL RESEARCH FOUNDATION

WHEAT WISE
Plotting the Future

Foliar-Applied Nitrogen-Fixing Biological Products In Spring Wheat (Kipling)

Objective: To determine if there are agronomic and economic benefits of applying a commercially available, foliar-applied N-fixing bacteria product (Envita®) in wheat.

Treatments:
1. Untreated check
2. Envita® application

Replicates: Four

General Trial Information:

Variety	SY Torach
Seeding date	May 27
Previous crop	Canola
Soil organic matter	3.3%
Residual Nitrate-N (0-24")	42 lbs N ac^{-1}
Applied N	90 lbs N ac^{-1} urea (granular blend) side-band
Plant density / Row spacing	25 plants ft^{-2} on 12" spacing

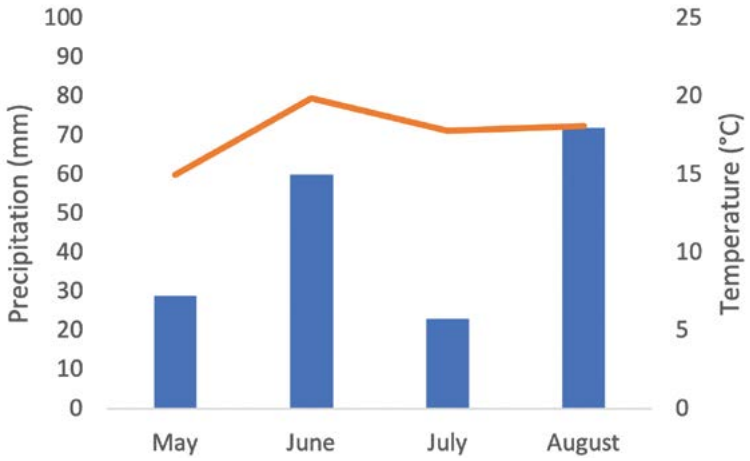
Envita® Application:

Date / Time	June 27 at 8:00 a.m.
Crop stage	3 leaf
Tank mix	Velocity
Water volume	10 gal ac^{-1}
Weather conditions	Dry, warm

In-crop pesticide applications:

June 27	Velocity

Weather: *Kipling EC station*



Results:

Treatment	Yield [1] (lbs ac^{-1} / bu ac^{-1})	Protein (%)	Test weight (g 0.5L^{-1})	Seed size (g 1000 seeds^{-1})
Check	1682 (28.0)	13.3	380.0	31.6
Envita®	1684 (28.1)	13.0	381.3	32.1
SE [2]	± 129 (2.1)	± 0.2	± 2.1	± 0.2
P-value [3]	*0.99*	*0.05***	*0.30*	*0.11*

Summary:
We were unable to detect differences in yield as a result of the application of Envita® foliar-applied N-fixing bacteria to spring wheat under these trial conditions. Protein was significantly lower with Envita® application than in untreated wheat (P<0.05). Test weight and seed size were unaffected by Envita® application.

Economics:
There was no significant difference in yield between treatments. Therefore, the most economical treatment is the check.

To review footnote references please refer to overall trial summary on page 103.

This trial was conducted with the agronomic support of

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WHEAT WISE
Plotting the Future

Foliar-Applied Nitrogen-Fixing Biological Products In Durum Wheat (Milestone)

Objective: To determine if there are agronomic and economic benefits of applying a commercially available, foliar-applied N-fixing bacteria product (Envita®) in wheat under varying rates of applied N fertilizer.

Treatments:

1. Normal N rate – Untreated
2. Normal N rate + Envita®
3. Reduced N rate – Untreated
4. Reduced N rate + Envita®

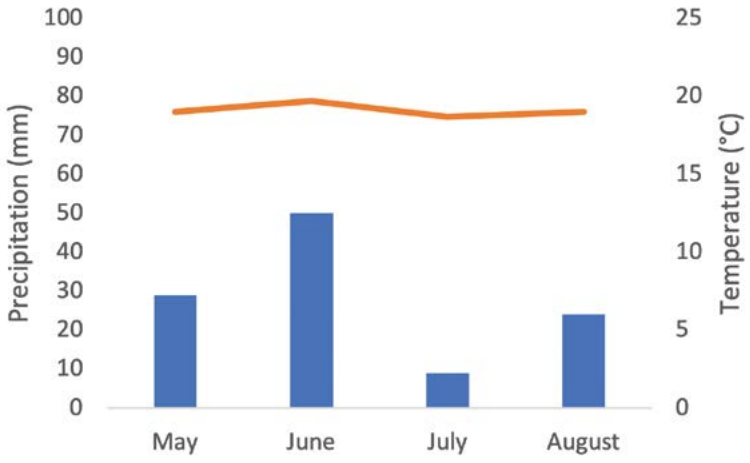
Replicates: Three

General Trial Information:		
Variety	AAC Congress Durum	
Seeding date	May 21	
Previous crop	Canola	
Soil organic matter	4.9%	
Residual Nitrate-N (0-24")	61 lbs ac^{-1}	
Applied N	Urea mid-row band	119 lbs N ac^{-1} (Normal) 107 lbs N ac^{-1} (Reduced)
Plant density / Row spacing	22 plants ft^{-2} on 10" spacing	

Envita® Application:	
Date / Time	June 22, 5:30 a.m.
Crop stage	6 leaf, 2 tillers
Tank mix	No
Water volume	10 gal ac^{-1}
Weather conditions	12°C, Wind 11 km hr^{-1}, High humidity

In-crop pesticide applications:	
June 9	Traxos + Stellar
July 15	Miravis Ace

Weather: *In-field weather station*



Results:

Treatment	Plant tissue (% N)[5]	Yield [1] (lbs ac^{-1} / bu ac^{-1})	Protein (%)	Test weight (g 0.5L^{-1})	Seed size (g 1000 seeds^{-1})
Normal N Check	4.86	4368 (72.8)	12.5	405	39.3
Normal N + Envita®	4.74	4316 (71.9)	11.2	405	39.8
Reduced N Check	4.70	4412 (73.5)	12.7	403	38.6
Reduced N + Envita®	4.66	4373 (72.9)	11.7	406	39.4
SE [2]	-	± 178 (3.0)	± 0.9	± 1.5	± 0.8
P-value (N rate) [3]	-	*0.72*	*0.72*	*0.83*	*0.42*
P-value (Envita®)	-	*0.75*	*0.20*	*0.17*	*0.37*
P-value (N x E) [4]	-	*0.96*	*0.85*	*0.26*	*0.82*

(5) Composite samples were submitted; statistical likelihood of treatment effect can not be determined.

Summary:
We were unable to detect differences in yield or grain quality as a result of the application of Envita® foliar-applied N-fixing bacteria to durum wheat, regardless of applied N rate, under these trial conditions.

Economics:
There was no significant difference in yield resulting from Envita® application, regardless of applied N rate. Therefore, the most economical treatment in regard to Envita® application is the check.

To review footnote references please refer to overall trial summary on page 103.

This trial was conducted with the agronomic support of

KAV **Kessler Ag Ventures**

WHEAT WISE
Plotting the Future

Foliar-Applied Nitrogen-Fixing Biological Products In Spring Wheat (Plenty)

Objective: To determine if there are agronomic and economic benefits of applying a commercially available, foliar-applied N-fixing bacteria product (Envita®) in wheat under varying rates of applied N fertilizer.

Treatments:

1. Normal N rate – Untreated
2. Normal N rate + Envita®
3. Reduced N rate – Untreated
4. Reduced N rate + Envita®

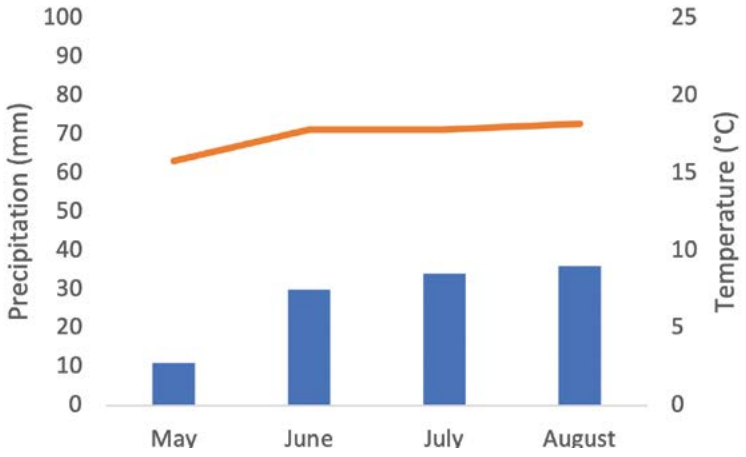
Replicates: Three

General Trial Information:		
Variety	AAC Brandon	
Seeding date	May 10	
Previous crop	Flax	
Soil organic matter	3.7%	
Residual Nitrate-N (0-24")	134 lbs ac^{-1}	
Applied N	Variable Rate UAN	Average 42 lbs N ac^{-1} (Normal) Average 38 lbs N ac^{-1} (Reduced)
Plant density / Row spacing	34 plants ft^{-2} on 12" spacing	

Envita® Application:	
Date / Time	June 9 in the morning
Crop stage	4-5 leaf
Tank mix	Barricade + Simplicity
Water volume	10 gal ac^{-1}
Weather conditions	Low 10°C, High 25°C

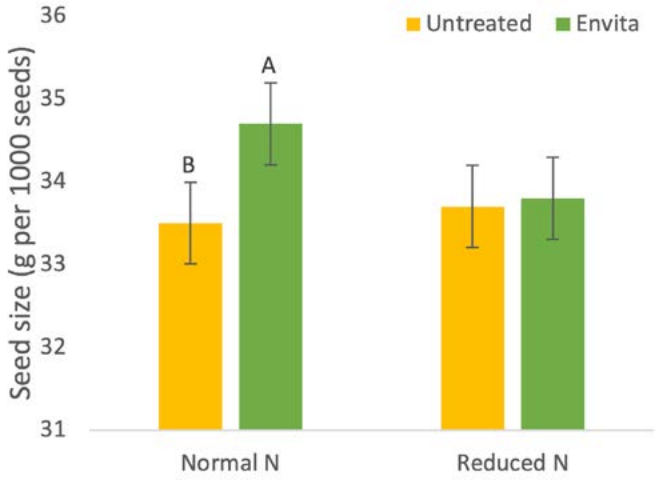
In-crop pesticide applications:	
June 9	Barricade + Simplicity (on untreated)

Weather: *Local station (precip)*
+ Kindersley Airport EC station (temps)



Results:

Treatment	Yield [1] (lbs ac^{-1} / bu ac^{-1})	Protein (%)	Test weight (g 0.5L^{-1})	Seed size (g 1000 seeds^{-1})
Normal N Check	1857 (31.0)	15.5	395	33.5
Normal N + Envita®	1884 (31.4)	15.4	397	34.7
Reduced N Check	1969 (32.8)	15.3	397	33.7
Reduced N + Envita®	1785 (29.7)	15.5	397	33.8
SE [2]	± 53 (0.9)	± 0.2	± 2.7	± 0.5
P-value (N rate) [3]	*0.90*	*0.83*	*0.79*	*0.16*
P-value (Envita®)	*0.17*	*0.95*	*0.49*	*0.03***
P-value (N x E) [4]	*0.08**	*0.31*	*0.36*	*0.07**



The effect of Envita® on seed size of wheat at two different applied N rates at Plenty. Note the seed size axis has been abbreviated. Treatments labeled with the same letter are not significantly different.

Summary:

There was a moderate probability (P<0.1) that the effect of Envita® may have differed with applied N rate. We were unable to detect a difference in protein or test weight as a result of the application of Envita®, however there was a significant effect of Envita® on seed size (P<0.05). Seed size was significantly higher with Envita® application at the normal N rate, but seed size was not affected by Envita® application at the reduced N rate.

Economics:

There was no significant difference in yield resulting from Envita® application, regardless of applied N rate. Therefore, the most economical treatment in regard to Envita® application is the check.

To review footnote references please refer to overall trial summary on page 103.

This trial was conducted with the agronomic support of

MAX AG CONSULTING Ltd.

WHEAT WISE
Plotting the Future

Foliar-Applied Nitrogen-Fixing Biological Products In Spring Wheat (Wynyard)

Objective: To determine if there are agronomic and economic benefits of applying a commercially available, foliar-applied N-fixing bacteria product (Envita®) in wheat under varying rates of applied N fertilizer.

Treatments:

1. Normal N rate – Untreated
2. Normal N rate + Envita®
3. Reduced N rate – Untreated
4. Reduced N rate + Envita®
5. Low N rate – Untreated
6. Low N rate + Envita®

Replicates: Three

General Trial Information:

Variety	AAC Starbuck VB	
Seeding date	May 14	
Previous crop	Canola	
Soil organic matter	3.8%	
Residual Nitrate-N (0-24")	36 lbs ac^{-1}	
Applied N	Urea (31 lbs N ac^{-1} for all treatments) + N-lock treated urea (VR) to total:	82 lbs. N ac^{-1} (Normal) 74 lbs. N ac^{-1} (Reduced) 62 lbs. N ac^{-1} (Low)
Plant density / Row spacing	Moderate density 12" spacing	

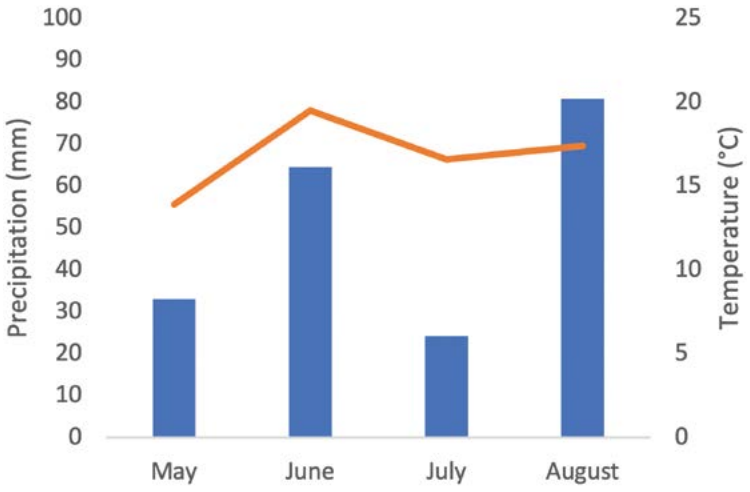
Envita® Application:

Date / Time	June 7 at 11:43 a.m.
Crop stage	Late herbicide timing (5-6 leaf)
Tank mix	Agral 90
Water volume	12 gal ac^{-1}
Weather conditions	26°C, RH 60%, wind 7 km hr^{-1}

In-crop pesticide applications:

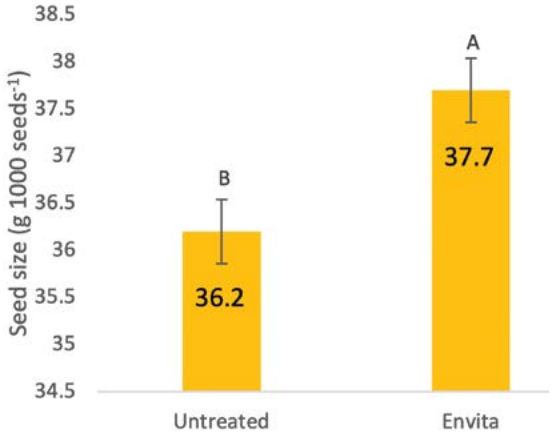
June 7	Rexade

Weather: *Environment Canada Station - Wynyard*



Results:

Treatment	Yield [1] (lbs ac^{-1} / bu ac^{-1})	Protein (%)	Test weight (g 0.5L^{-1})	Seed size (g 1000 seeds^{-1})
Normal N Check	3605 (60.1)	13.4	381	35.9
Normal N + Envita®	4081 (68.0)	12.9	382	36.8
Reduced N Check	3821 (63.7)	13.1	383	36.4
Reduced N + Envita®	3957 (65.9)	12.7	383	37.4
Low N Check	3851 (64.2)	12.9	380	36.2
Low N + Envita®	3952 (65.9)	12.3	374	39.0
SE [2]	± 107 (1.8)	± 0.3	± 5	± 0.7
P-value (N rate) [3]	*0.81*	*0.20*	*0.45*	*0.15*
P-value (Envita®)	*0.06**	*0.07**	*0.71*	*0.01***
P-value (N x E) [4]	*0.16*	*0.92*	*0.69*	*0.21*



The effect of Envita® application on harvested wheat seed size at Wynyard, averaged across N rates. Note the seed size axis has been abbreviated. Treatments labeled with the same letter are not significantly different.

Summary:
Wheat yield and quality were not significantly affected by N rate, regardless of Envita application, under these trial conditions. Averaged across N rates, Envita application significantly increased seed size ($P<0.01$), and may have increased yield ($P<0.1$) and decreased protein ($P<0.1$).

Economics:
There was no significant ($P<0.05$) difference in yield resulting from Envita® application, regardless of applied N rate. Therefore, the most economical treatment in regard to Envita® application is the check.

To review footnote references please refer to overall trial summary on page 103.

This trial was conducted with the agronomic support of

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