



Pulse Replicated On-Farm Independent Trials

Chickpea Inoculation Trial

*Chickpeas rely on a symbiotic relationship with *Mesorhizobium ciceri* bacteria to fix atmospheric nitrogen, making inoculation a critical step in maximizing crop performance. On virgin ground with no prior history of chickpeas, these bacteria are typically absent, and without inoculation, nitrogen fixation—and consequently yield—can be severely limited. In contrast, fields previously inoculated may still harbour residual rhizobial populations. Still, their abundance and effectiveness can decline over time due to crop rotation gaps, environmental conditions, or soil disturbances. By comparing inoculated chickpeas on virgin ground versus previously inoculated ground, this trial will help determine the ongoing need and potential benefits of re-inoculation, providing valuable insights to optimize both agronomic practices and input costs for producers.*

Objective

To evaluate the effectiveness of chickpea inoculant application on virgin ground (no previous chickpea inoculation history) compared to previously inoculated ground (last inoculated in 2020), assessing nodulation, plant growth, and yield response.

Treatments

Virgin ground with no previous chickpea inoculation history

Previously inoculated ground that was last inoculated in 2020

This trial was conducted in blocks. In each block, four representative strips will be combined, for a total of eight strips. Apart from the inoculant, blocks were managed the same agronomically, including seed, fertility, and pesticide applications. Seed was sized using round hole sieves ranging from 14r to 24r.



Data Collection

- Fall or spring soil test
- Field history and management practices
- General in-season observations
- Weighed Yield
- Grain samples for analysis
- Daily precipitation and temperature

The following footnotes will be referred to for the individual site report for this protocol:

¹SED is a measure of how much variability (same units as mean) you would expect in the difference between sample means if you repeated the experiment several times. The Least Significant Difference (LSD) is approximately two times the Standard Error of Difference (SED).

²A linear regression was used to assess the effects of varieties on the response variables. The data were also analyzed using the Mixed Model procedure in JMP, with replicate considered a random effect and inoculation considered a fixed effect. Treatment means were separated using the LSD test. All treatment effects and differences between means were considered significant at $p \leq 0.05$. However, p-values of 0.05–0.1 may also be acknowledged.

$P < 0.05$: There is a 95% probability (19 out of 20 times) that the observed difference is due to the treatment rather than random variation.

$P < 0.1$: There is a 90% probability (9 out of 10 times) that the difference is due to the treatment effect.

$P > 0.1$: There is a higher likelihood that the observed difference is due to random variability rather than the treatment.





Chickpea Inoculation (Central Butte)

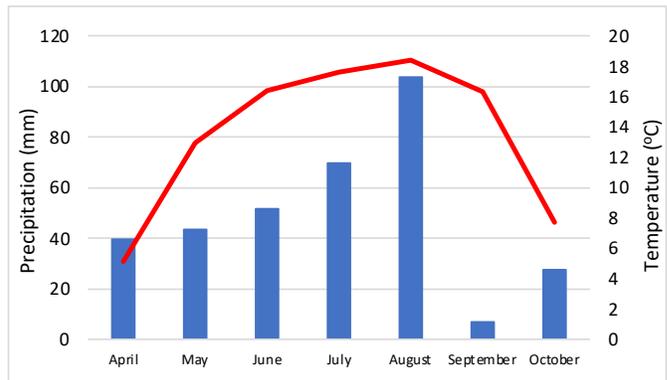
Objective: To evaluate the effects of crop history on chickpea production, this study will compare land that previously grew chickpeas in 2020 with land that has never been used for chickpea cultivation.

Trt #	Description
1	First year of chickpeas, four fungicide applications
2	First year of chickpeas, five fungicide applications
3	Second year of chickpeas, five fungicide applications
4	Second year of chickpeas, four fungicide applications

General Trial Information

Variety	CDC Pasqua (Kabuli)
Germ	92%
Seed Treatment	Vibrance® Maxx (metalaxyl, fludioxonil + sedaxane)
Inoculant	TagTeam®
Seeding Rate	160 lb/ac
Previous Crop	Canola
Soil Organic Matter	3.8%
Residual Nitrate-N (Fall 2024)	
- 0-6"	24 lb/ac
- 6-24"	53 lb/ac
Seeding Date	April 30, 2025
Seeding Equipment	Bourgault 3320/9950
Seeding Depth	1"
Seeding Speed	3.8 mph
Row Spacing	10"
Total Applied Fertilizer (lb/ac N-P-K-S)	3 – 6 – 0 – 0

Precipitation and Temperature from local weather station (May - October 23)



Crop Protection

- April 20: Authority® (sulfentrazone)
- May 9: Glyphosate + Aim® (carfentrazone)
- May 29: Solo® Ultra (imazamox + sethoxydim)
- June 12: Zetigo® (florylpicoxamid + pyraclostrobin)
- June 24: Miravis® Neo (pydiflumetofen, azoxystrobin + propiconazole)
- July 8: Revy® Pro (mefentrifluconazole + prothioconazole)
- July 24 + August 6: Bravo® ZN (chlorothalonil)
- September 15: Glyphosate
- September 22 + October 8: Bolster® (diquat)

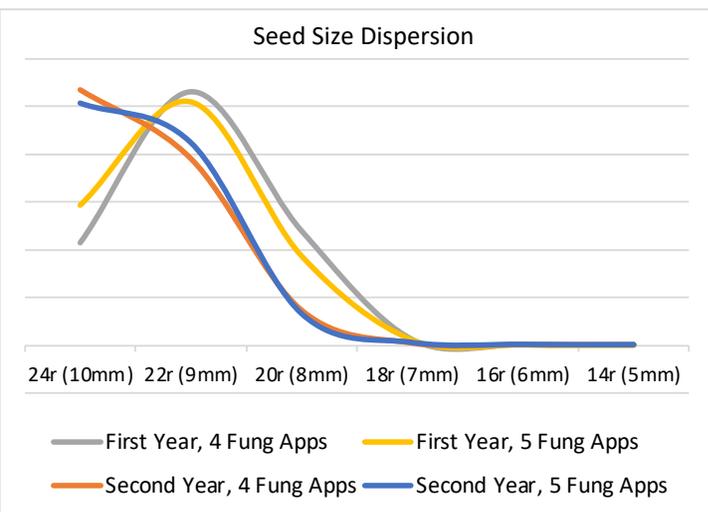
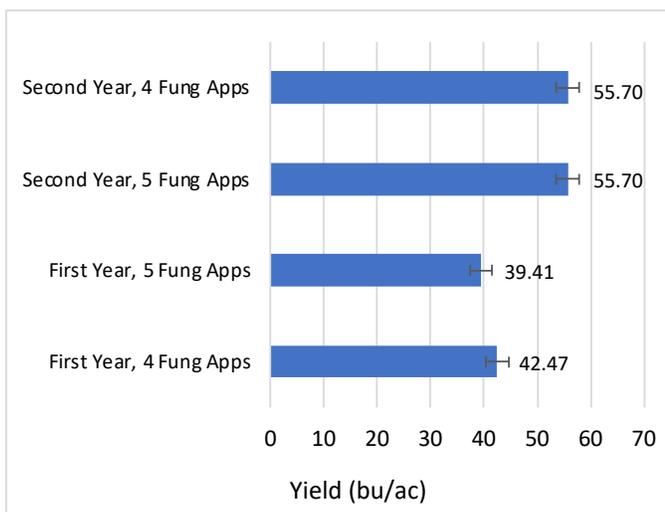
Note: The lack of true replication in this trial imposes certain constraints on statistical analysis and interpretation. Nonetheless, several analytical methods were applied and consistently led to the conclusions reported.

1	2	3	4	5	6	7	8	9	10	11	12
1	1	1	1	2	2	3	3	3	3	4	4
Second Year, 5 Fung Apps	Second Year, 4 Fung Apps	Second Year, 4 Fung Apps	First Year, 5 Fung Apps	First Year, 5 Fung Apps							

Results

	Yield (bu/ac)	Thousand Kernel Weight (TKW) (g/1000)	Test Weight (TW) (kg/hL)	Protein (%)	Moisture (%)
First year, four fungicide applications	42.47 b	441.42 c	79.45 ab	18.76 b	15.04 a
First year, five fungicide applications	39.41 b	457.33 b	80.81 a	18.98 b	15.00 a
Second year, five fungicide applications	55.70 a	495.92 a	78.80 b	20.73 a	14.96 a
Second year, four fungicide applications	55.70 a	508.67 a	79.03 ab	20.73 a	15.38 a
SED ¹	2.10	6.40	0.860	0.203	0.348
p-value ²	<0.0001	<0.0001	0.208	<0.0001	0.691

	24r(g)	22r(g)	20r(g)	18r(g)	16r(g)	14r(g)
First year, four fungicide applications	53.66 b	132.76 a	59.88 a	2.99 a	0.35 a	0.06 a
First year, five fungicide applications	73.08 b	127.00 a	46.53 a	2.68 a	0.13 a	0.00 a
Second year, five fungicide applications	126.31 a	105.64 b	16.24 b	1.18 a	0.18 a	0.06 a
Second year, four fungicide applications	133.28 a	97.28 b	18.00 b	0.83 a	0.08 a	0.05 a
SED ¹	8.55	7.53	7.87	1.53	0.227	0.077
p-value ²	<0.0001	0.003	0.001	0.406	0.608	0.851



Summary

Land that previously grew chickpeas in 2020 produced significantly higher yields and protein levels than chickpea-virgin land, regardless of fungicide application frequency. TKW was also markedly greater on the previously cropped land, while TW and moisture did not differ significantly among treatments. In addition, fields with a 2020 chickpea history had substantially large seed fractions (24r) and fewer small fractions (22r, 20r), indicating improved overall seed size and quality compared with virgin land. Differences between four and five fungicide applications were minimal, showing that crop history had a much stronger effect on yield and seed characteristics than fungicide frequency. Overall, prior chickpea production exerted a greater influence on performance than adding an extra fungicide application.



✳ To review footnote references please refer to overall trial summary on page 139.



This trial was conducted with the agronomic support of

