

*Study of the influence of fertilizers on corn growth and yield*

**Badanie wpływu nawozów na wzrost i plonowanie kukurydzy**

Trial season: 2023/2024  
Trial ID: PL24FERTGOUDENKORREL\_ZEAMX  
Research number: 7/2024  
Trial code: AP/24/K/7/Zł  
Location: Poland

**SPONSOR**  
GOUDENKORREL SPÓŁKA AKCYJNA  
ul. Fabryczna 5,  
87-840 Lubień Kujawski

**REPORT AUTHOR**  
Artur Strzeliński

## UP Poznań, ZD Złotniki

Ocena skuteczności nawozów w uprawie, kukurydzy

Trial ID: PL24FERTGOUDENKORREL\_ZEAMX  
 Protocol ID: PL24FERTGOUDENKORREL Location: Poland Trial Year: 2024  
 Study Director: Artur Strzeliński Sponsor Contact: Gouden Korrel  
 Investigator: Artur Strzeliński

Trt No.	Treatment Name	Description	Rate	Rate Unit
1	Untreated Check	not treated		
2	Belenus		400kg/ha	
3	Belenus		800kg/ha	

Replications: 4, Untreated treatments: 1, Design: Randomized Complete Block (RCB), Treatment units: Treated 'Plot' experimental unit size, Dry Form. Unit: %, Treated 'Plot' experimental unit size Width: 3 meters, Treated 'Plot' experimental unit size Length: 10 meters, Application amount: 200 L/ha, Mix size: 3 L, Overage: 25%, Format definitions: G-All7.def, G-All7.frm

Product quantities required for listed treatments and applications of trials included in this table:

Amount*	Unit	Treatment Name	Form Conc	Form Unit	Form Type	Lot Code
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### Trial Map Treatment Description

Trt	Code	Description
1	CHK	Untreated Check
2		Belenus 400 kg/ha
3		Belenus 800 kg/ha



Trial Comments

### General Trial Information

Study Director: Artur Strzeliński  
 Investigator: Artur Strzeliński

Discipline: D fertilizer  
 Status: F one-year/final  
 ARM Trial Created On: Nov-19-2024  
 Initiation Date: Apr-26-2024  
 Completion Date: Dec-2-2024

### Trial Location

Address (Location): UP Poznan  
 City: Złotniki Country: POL Poland  
 State/Prov.: Wielkopolskie  
 Postal Code: 62-002 Climate Zone: EPPONE Eppo North East

Latitude of LL Corner °: 52,490162 N  
 Longitude of LL Corner °: 16,818203 E

### Regulations

Test Facility: Poznan University of Life Sciences ZDD GORZYŃ  
 Conducted Under GLP: No  
 Conducted Under GEP: No

Contacts	
<b>Role:</b>	STYDIR study director
<b>Study Director:</b>	Artur Strzeński
<b>Organization:</b>	UP Poznań ZDURiR Złotniki
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<b>Postal Code:</b>	60-637
<b>Role:</b>	INVEST investigator
<b>Investigator:</b>	Artur Strzeński
<b>Organization:</b>	UP Poznań ZDD URiR Gorzyń
<b>Address 1:</b>	Wojska Polskiego 28
<b>Country:</b>	POL Poland
<b>City:</b>	Poznań
<b>E-mail:</b>	artur.strzelinski@up.poznan.pl
<b>State/Prov:</b>	30
<b>Postal Code:</b>	60-637
<b>Role:</b>	SPONSR sponsor
<b>Sponsor:</b>	Gouden Korrel

Crop Description	
<b>Crop 1:</b>	C ZEAMX Zea mays
<b>Entry Date:</b>	Nov-20-2024
<b>Variety:</b>	Farmfire
<b>Planting Date:</b>	Apr-24-2024
<b>Depth:</b>	5 cm
<b>Row Spacing:</b>	75 cm
<b>Spacing within Row:</b>	18 cm
<b>Emergence Date:</b>	May-3-2024
<b>Harvest Date:</b>	Sep-27-2024
<b>Stage Scale:</b>	BBCH
<b>Planting Rate:</b>	75000 S/ha
<b>Planting Method:</b>	DRILLE drilled
<b>Planting Equipment:</b>	SR drilling machine
<b>Harvested Width:</b>	1,5 m
<b>Harvested Length:</b>	10 m
<b>% Standard Moisture:</b>	30,0
<b>BBCH Scale:</b>	BCOR

Site and Design	
<b>Treated Plot Width:</b>	3 m
<b>Treated Plot Length:</b>	10 m
<b>Treated Plot Area:</b>	30,0 m <sup>2</sup>
<b>Replications:</b>	4
<b>Treatments:</b>	3
<b>Plots:</b>	12
<b>Distance between Blocks:</b>	0 m
<b>Distance between 'Plot' Experimental Units:</b>	0 m
<b>Site Type:</b>	FIELD field
<b>Experimental Unit:</b>	1 PLOT plot
<b>Tillage Type:</b>	CONTIL conventional-till
<b>Study Design:</b>	RACOBL Randomized Complete Block (RCB)

Previous		
No.	Crop	Year
1.	HORVS	2023

Maintenance							
No.	Date	Type	Maintenance Product Name	Form Type	Rate	Rate Unit	Comment
1.	Apr-22-2024	FERT	Polidap		150	kg/ha	N - 18; P - 46 / 100kg
2.	Apr-22-2024	FERT	Mocznik		200	kg/ha	N - 46 / 100kg
3.	Apr-26-2024	HERB	Lumax 537,5	SE	4,0	l/ha	

Soil Description	
<b>Description Name:</b>	Złotniki
<b>% Sand:</b>	66
<b>% Silt:</b>	21
<b>% Clay:</b>	13
<b>% OM:</b>	1,4
<b>Texture:</b>	LS loamy sand
<b>Fert. Level:</b>	G good
<b>pH:</b>	7

Weather Conditions			
<b>Weather Station Name:</b>	Złotniki	<b>Code:</b>	62-002
<b>Distance:</b>	1 km		

No.	Date	Moisture Total	Unit	Min Temp	Max Temp	Temp Unit	Avg % Relative Humidity
1.	Apr-1-2024	1,5	mm	8,2	19,4	C	79,1
2.	Apr-2-2024	0	mm	9,9	13,7	C	77,4
3.	Apr-3-2024	1,7	mm	7,9	11,5	C	76,3
4.	Apr-4-2024	5,9	mm	7,1	17,2	C	84,9
5.	Apr-5-2024	3	mm	10,1	17,7	C	90,5
6.	Apr-6-2024	0	mm	12	20	C	80
7.	Apr-7-2024	0	mm	13,9	20,2	C	77,9
8.	Apr-8-2024	0	mm	13,9	21,7	C	76,3
9.	Apr-9-2024	0	mm	11,2	24,8	C	59,7
10.	Apr-10-2024	0	mm	4,4	17,2	C	69,8
11.	Apr-11-2024	0	mm	9,5	18,3	C	73,2
12.	Apr-12-2024	0	mm	12,6	19,5	C	74,1
13.	Apr-13-2024	0	mm	6,7	16,3	C	65,7
14.	Apr-14-2024	9,4	mm	6,5	11,5	C	72,1
15.	Apr-15-2024	5,7	mm	4,3	10	C	80,7
16.	Apr-16-2024	0,9	mm	2,8	9,4	C	81,5

17.	Apr-17-2024	1,7	mm	1	8	C	80,6
18.	Apr-18-2024	6,3	mm	1,8	8	C	86,6
19.	Apr-19-2024	0,9	mm	1,6	5,4	C	82,3
20.	Apr-20-2024	0	mm	-2	6	C	66,9
21.	Apr-21-2024	0,1	mm	-2	4,3	C	74
22.	Apr-22-2024	0	mm	-4	8,2	C	70,6
23.	Apr-23-2024	0	mm	2,2	10	C	58,8
24.	Apr-24-2024	0,7	mm	-1,6	10	C	76,4
25.	Apr-25-2024	0	mm	0,1	14,4	C	63,5
26.	Apr-26-2024	0	mm	3,9	20,2	C	57,7
27.	Apr-27-2024	0	mm	8	22,2	C	54,3
28.	Apr-28-2024	0	mm	10	24,2	C	59,9
29.	Apr-29-2024	0	mm	11,3	27,6	C	52,6
30.	Apr-30-2024	0	mm	11,3	27,39	C	55,8
31.	May-1-2024	0	mm	11	26	C	46,2
32.	May-2-2024	0	mm	11	26	C	45
33.	May-3-2024	0	mm	12	26	C	52,8
34.	May-4-2024	0	mm	12	27	C	65
35.	May-5-2024	3,2	mm	10,8	24,6	C	72,9
36.	May-6-2024	0	mm	9,8	18,2	C	64,6
37.	May-7-2024	0	mm	7,6	16,5	C	67,3
38.	May-8-2024	0	mm	5	17,5	C	53,4
39.	May-9-2024	0	mm	2,5	19	C	53
40.	May-10-2024	0	mm	6,3	20	C	63,8
41.	May-11-2024	0	mm	10	16	C	70,8
42.	May-12-2024	0	mm	5	20	C	45,7
43.	May-13-2024	0	mm	6	22,4	C	43,1
44.	May-14-2024	0	mm	8	23,5	C	41,4
45.	May-15-2024	0	mm	12	23,4	C	37,8
46.	May-16-2024	0	mm	12	24,4	C	39,3
47.	May-17-2024	0	mm	13	23,7	C	36
48.	May-18-2024	0	mm	10,4	21,9	C	57,2
49.	May-19-2024	24,6	mm	13,9	22,8	C	70,3
50.	May-20-2024	0	mm	11,4	23,6	C	71,8
51.	May-21-2024	0	mm	13,3	26,4	C	65
52.	May-22-2024	0,2	mm	17,3	26,5	C	65
53.	May-23-2024	11,8	mm	16,1	19,9	C	93,1
54.	May-24-2024	8	mm	13,6	22,9	C	78,2
55.	May-25-2024	0	mm	14,3	23,2	C	76,8
56.	May-26-2024	0	mm	14,8	25,8	C	69,3
57.	May-27-2024	0	mm	15,8	26,2	C	64,5
58.	May-28-2024	21	mm	14,1	25,9	C	82,9
59.	May-29-2024	0,2	mm	13,4	22,1	C	76,6
60.	May-30-2024	0	mm	13,1	24,6	C	74,4
61.	May-31-2024	4	mm	16	24,8	C	75,2
62.	Jun-1-2024	2	mm	16,3	25	C	80,4
63.	Jun-2-2024	6,2	mm	16	22,7	C	91,5
64.	Jun-3-2024	0,6	mm	14,6	20,1	C	95,9
65.	Jun-4-2024	0	mm	14,2	22,3	C	76,6
66.	Jun-5-2024	1,3	mm	11,9	24,3	C	73,7
67.	Jun-6-2024	3,1	mm	13,3	21,5	C	76,1
68.	Jun-7-2024	1,3	mm	12,2	19,6	C	79,3
69.	Jun-8-2024	0	mm	10	24	C	68,7
70.	Jun-9-2024	0	mm	14	20,6	C	71
71.	Jun-10-2024	0	mm	12,2	20,9	C	67,8
72.	Jun-11-2024	0	mm	8,2	16,4	C	68,9
73.	Jun-12-2024	0	mm	7,4	19,6	C	71,8
74.	Jun-13-2024	6,8	mm	6,9	17,9	C	85,3
75.	Jun-14-2024	0	mm	6,2	19,2	C	73,3
76.	Jun-15-2024	0	mm	11,9	24,7	C	65,5
77.	Jun-16-2024	0	mm	12,4	25,1	C	76,3
78.	Jun-17-2024	0	mm	13,3	24,6	C	76,5
79.	Jun-18-2024	0	mm	12,4	28,1	C	71,5
80.	Jun-19-2024	12,4	mm	12,2	21,1	C	71,4
81.	Jun-20-2024	0,2	mm	11,2	23,2	C	71,3
82.	Jun-21-2024	1,2	mm	12,5	28	C	71
83.	Jun-22-2024	3,6	mm	13,2	20,4	C	86,6
84.	Jun-23-2024	0	mm	11,6	24,2	C	70,8
85.	Jun-24-2024	0	mm	10,6	25,5	C	67,7
86.	Jun-25-2024	0	mm	14,8	24,6	C	75,3
87.	Jun-26-2024	0	mm	14,2	29,6	C	77,5
88.	Jun-27-2024	0	mm	16,5	32	C	68,9
89.	Jun-28-2024	0	mm	18,3	31,5	C	94,7
90.	Jun-29-2024	0	mm	14,2	31,6	C	75,4
91.	Jun-30-2024	0	mm	20,8	35,6	C	71
92.	Jul-1-2024	4,2	mm	15,7	27,8	C	91,4

93.	Jul-2-2024	0,4	mm	13,5	22,5	C	86,1
94.	Jul-3-2024	0	mm	11,2	21,6	C	79,1
95.	Jul-4-2024	8	mm	10,4	22,3	C	87,6
96.	Jul-5-2024	0	mm	9,7	24,3	C	73,7
97.	Jul-6-2024	2,2	mm	11,1	31,6	C	67
98.	Jul-7-2024	0,2	mm	15,1	25,4	C	70
99.	Jul-8-2024	0	mm	14,1	30,2	C	65,6
100.	Jul-9-2024	0	mm	13,6	33	C	63,9
101.	Jul-10-2024	4	mm	20,3	36,4	C	76,9
102.	Jul-11-2024	0,2	mm	17,6	30,3	C	95
103.	Jul-12-2024	20,4	mm	14,8	31,6	C	90,2
104.	Jul-13-2024	3	mm	15,1	23,6	C	91,5
105.	Jul-14-2024	3,4	mm	15,1	27,1	C	93,5
106.	Jul-15-2024	0	mm	14,2	32,7	C	74,4
107.	Jul-16-2024	0	mm	18,7	34	C	70,6
108.	Jul-17-2024	0	mm	15,4	26,9	C	73,7
109.	Jul-18-2024	0	mm	13,1	27,3	C	78,7
110.	Jul-19-2024	0	mm	12,7	29,8	C	72,3
111.	Jul-20-2024	0	mm	13,9	31,8	C	67,6
112.	Jul-21-2024	0	mm	14	34,7	C	64,1
113.	Jul-22-2024	0	mm	15,8	29,2	C	94
114.	Jul-23-2024	0,2	mm	12,5	28,9	C	72,2
115.	Jul-24-2024	9	mm	15	24,4	C	94,8
116.	Jul-25-2024	0,2	mm	11,8	25,6	C	74,5
117.	Jul-26-2024	0	mm	9,6	29,4	C	68
118.	Jul-27-2024	0,2	mm	13,3	25,9	C	86,4
119.	Jul-28-2024	7,8	mm	13,9	19,7	C	98,3
120.	Jul-29-2024	0	mm	12,2	23,4	C	79,2
121.	Jul-30-2024	0	mm	8,9	29,3	C	74,3
122.	Jul-31-2024	0	mm	11,2	30	C	70,5
123.	Aug-1-2024	0	mm	13,2	29,5	C	69,3
124.	Aug-2-2024	0,2	mm	13,5	23,2	C	93,4
125.	Aug-3-2024	0	mm	13,7	27,1	C	74,8
126.	Aug-4-2024	0	mm	11	25,1	C	89,5
127.	Aug-5-2024	0,2	mm	11	21,9	C	89,7
128.	Aug-6-2024	0	mm	7,6	27,6	C	74,7
129.	Aug-7-2024	0	mm	10,1	30,6	C	70,5
130.	Aug-8-2024	2,2	mm	15,2	24,7	C	91,5
131.	Aug-9-2024	0,2	mm	10,5	28,1	C	78,2
132.	Aug-10-2024	0,2	mm	15	26,3	C	75,3
133.	Aug-11-2024	0	mm	12,3	25,8	C	73
134.	Aug-12-2024	0	mm	10,1	28,2	C	65,7
135.	Aug-13-2024	0	mm	11,9	30,4	C	60,2
136.	Aug-14-2024	0	mm	15,2	31,5	C	40,1
137.	Aug-15-2024	4,8	mm	19,1	32,7	C	53,6
138.	Aug-16-2024	0	mm	16,8	31,7	C	80,3
139.	Aug-17-2024	0	mm	15,7	32,8	C	76,6
140.	Aug-18-2024	0	mm	17,2	33	C	75,6
141.	Aug-19-2024	0	mm	15	25,9	C	82,6
142.	Aug-20-2024	0	mm	12,8	28,1	C	84,3
143.	Aug-21-2024	22,2	mm	13,6	22,8	C	71,8
144.	Aug-22-2024	0	mm	10,9	20,9	C	76,4
145.	Aug-23-2024	0	mm	13,4	27,3	C	62,9
146.	Aug-24-2024	0	mm	13,5	31,3	C	59,4
147.	Aug-25-2024	0	mm	14,8	26,4	C	48,6
148.	Aug-26-2024	0	mm	13	25	C	78,4
149.	Aug-27-2024	0	mm	9,8	26,3	C	89,1
150.	Aug-28-2024	0	mm	14,9	29,1	C	62,4
151.	Aug-29-2024	0	mm	18,2	32	C	75
152.	Aug-30-2024	0	mm	16,5	33,9	C	69,9
153.	Aug-31-2024	2,4	mm	12,8	23,7	C	84,4
154.	Sep-1-2024	0	mm	10,4	24,3	C	63,4
155.	Sep-2-2024	0	mm	10,3	26,8	C	82
156.	Sep-3-2024	0	mm	15,5	31,9	C	69
157.	Sep-4-2024	0	mm	18,3	31,9	C	45,1
158.	Sep-5-2024	0	mm	17,4	30,2	C	42,7
159.	Sep-6-2024	0	mm	15,9	29,9	C	41,6
160.	Sep-7-2024	0	mm	16,3	31,8	C	44,9
161.	Sep-8-2024	0	mm	17,8	31,7	C	50,6
162.	Sep-9-2024	7,2	mm	16,1	22,9	C	83,9
163.	Sep-10-2024	0,2	mm	10,8	20,7	C	94,3
164.	Sep-11-2024	0,4	mm	9,8	19,5	C	92,6
165.	Sep-12-2024	4,6	mm	10,7	13,2	C	100
166.	Sep-13-2024	15,8	mm	9,4	10,8	C	100
167.	Sep-14-2024	0	mm	10,8	16,8	C	89,6
168.	Sep-15-2024	3,6	mm	13,2	16	C	95,2

169.	Sep-16-2024	12,6	mm	14,9	23,1	C	95,4
170.	Sep-17-2024	0	mm	12,6	24,9	C	84,4
171.	Sep-18-2024	0	mm	10,5	25,5	C	83,9
172.	Sep-19-2024	0	mm	10,2	23,4	C	82,9
173.	Sep-20-2024	0	mm	7,2	23,4	C	70,7
174.	Sep-21-2024	0	mm	4,4	24	C	74,4
175.	Sep-22-2024	0	mm	5,5	25,2	C	76,9
176.	Sep-23-2024	0	mm	8,3	21,7	C	83,1
177.	Sep-24-2024	0,8	mm	8,1	23	C	90,2
178.	Sep-25-2024	0	mm	10,8	21	C	90,9
179.	Sep-26-2024	0,6	mm	11,1	17,4	C	98,6
180.	Sep-27-2024	1,8	mm	14	21,6	C	76,4
181.	Sep-28-2024	0	mm	8,6	17,2	C	63,6
182.	Sep-29-2024	0,2	mm	3,5	15,7	C	88,4
183.	Sep-30-2024	0,2	mm	-0,3	14,9	C	81,6

#### Application Description

	A
Date	Apr-24-2024
Start Time	10:00 AM
Stop Time	10:25 AM
Method	SPREAD
Timing	00
Placement	SOIL
Applied By	Dawid Wadziński
Entry Date	Nov-20-2024
Air Temperature Start, Stop	8,8; 8,8 C
% Relative Humidity Start, Stop	63; -
Wind Velocity+Dir. Start	0,8 MPS; SW
Wind Velocity+Dir. Stop	0,8 MPS; SW
Wind Velocity+Dir. Max	0,8 MPS; SW
Soil Temperature	7,8 C
Soil Moisture	FINE
% Cloud Cover	100
First Moisture Occurred On	Apr-24-2024
Time to First Moisture	7,0 HR
Amount of First Moisture	0,1 mm
Moisture 1 Week Before Appl.	9 mm
Moisture 6 Hours After Appl.	0 mm
Moisture 24 Hours After Appl.	0,7 mm
Moisture 1 Week After Appl.	0,7 mm
Problems with Application?	N; no

#### Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale	ZEAMX; BCOR
Days after Emergence	-9
Stage Majority, Percent	00; 100
Stage Minimum, Percent	00; 0
Stage Maximum, Percent	00; 0

#### Application Equipment

	A
Equipment Type	MANSR
% Coverage	100

RESULTS:							
Assessed By	Strzeliński	Strzeliński	Strzeliński	Strzeliński	Strzeliński	Strzeliński	Strzeliński
Rating Date	May-10-2024	May-10-2024	May-23-2024	May-23-2024	Jun-3-2024	Jun-3-2024	Jun-10-2024
Rating Time							
SE Name							
SE Description							
Part Rated							
Rating Type	PHYGEN	VIGOR	PHYGEN	VIGOR	PHYGEN	VIGOR	PHYGEN
Rating Unit	%	%	%	%	%	%	%
Rating Min/Max/Interval	0; 100; -	0; 100; -	0; 100; -	0; 100; -	0; 100; -	0; 100; -	0; 100; -
Sample Size	1 PLOT	1 PLOT	1 PLOT	1 PLOT	- PLOT	1 PLOT	1 PLOT
Collection Basis							
Reporting Basis							
Calculation							
Number of Subsamples	1	1	1	1	1	1	1
Crop Type, Code	C; ZEAMX	C; ZEAMX	C; ZEAMX	C; ZEAMX	C; ZEAMX	C; ZEAMX	C; ZEAMX
BBCH Scale	BCOR	BCOR	BCOR	BCOR	BCOR	BCOR	BCOR
Crop Scientific Name	Zea mays	Zea mays	Zea mays	Zea mays	Zea mays	Zea mays	Zea mays
Crop Name	Corn	Corn	Corn	Corn	Corn	Corn	Corn
Crop Variety	Farmfire	Farmfire	Farmfire	Farmfire	Farmfire	Farmfire	Farmfire
Crop Stage Scale	BBCH	BBCH	BBCH	BBCH	BBCH	BBCH	BBCH
Crop Stage Majority/Min/Max	11; 11; 12	11; 11; 12	14; 12; 16	14; 12; 16	16; 15; 16	16; 15; 16	18; 16; 18
Days After First/Last Applic.	16; 16	16; 16	29; 29	29; 29	40; 40	40; 40	47; 47
Trt-Eval Interval	16 DA-A	16 DA-A	29 DA-A	29 DA-A	40 DA-A	40 DA-A	47 DA-A
Plant-Eval Interval	16 DP-1	16 DP-1	29 DP-1	29 DP-1	40 DP-1	40 DP-1	47 DP-1
Days After Emergence	7 DE-1	7 DE-1	20 DE-1	20 DE-1	31 DE-1	31 DE-1	38 DE-1
ARM Action Codes							
Number of Decimals							
Trt Treatment	1	2	3	4	5	6	7
No. Name							
Rate							
Rate Unit							
1 Untreated Check	0,0na	100,0na	0,0na	100,0na	0,0na	100,0na	0,0na
2 Belenus 400kg/ha	0,0na	100,0na	0,0na	100,0na	0,0na	100,0na	0,0na
3 Belenus 800kg/ha	0,0na	100,0na	0,0na	100,0na	0,0na	100,0na	0,0na
LSD P=.05							
Standard Deviation	0,00	0,00	0,00	0,00	0,00	0,00	0,00
CV	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Grand Mean	0,00	100,00	0,00	100,00	0,00	100,00	0,00
Levene's F	0,00*	0,00*	0,00*	0,00*	0,00*	0,00*	0,00*
Rank X2	.	.	.	.	.	.	.
P(Rank X2)	.	.	.	.	.	.	.
Skewness	.	.	.	.	.	.	.
Kurtosis	.	.	.	.	.	.	.

Means followed by same letter or symbol do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Could not calculate LSD (% mean diff) or mean separation letters for columns 1,2,3,4,5,6,7,8,9,10 because error variance is 0.

Mean separation letters are 'na' (not applicable) when error variance is 0

Assessed By	Strzeński Jun-10-2024	Strzeński Jul-17-2024	Strzeński Jul-17-2024	Strzeński Jul-17-2024	Strzeński Jul-17-2024	Strzeński Jul-17-2024	Strzeński May-23-2024 10:00 PM	Strzeński May-23-2024	Strzeński Jun-10-2024
Rating Date									
Rating Time									
SE Name					ZUSX007	ZUSX007			
SE Description					Plant Height	Plant Height	NDVI	NDVI	NDVI
Part Rated					PLANT; -	PLANT; -			
Rating Type	VIGOR	PHYGEN	VIGOR	VIGOR	PLANT; -	PLANT; -			
Rating Unit	%	%	%	%	HEIGHT	HEIGHT			
Rating Min/Max/Interval	0; 100; -	0; 100; -	0; 100; -	0; 100; -	CM	CM			
Sample Size	1 PLOT	1 PLOT	1 PLOT	1 PLOT			1 PLOT	1 PLOT	1 PLOT
Collection Basis					10 PLANT	10 PLANT			
Reporting Basis					1 PLOT	1 PLOT			
Calculation					10 PLANT	10 PLANT			
Number of Subsamples	1	1	1	1	IN	IN			
Crop Type, Code	C; ZEAMX	C; ZEAMX	C; ZEAMX	C; ZEAMX	C; ZEAMX	C; ZEAMX	C; ZEAMX	C; ZEAMX	C; ZEAMX
BBCH Scale	BCOR	BCOR	BCOR	BCOR	BCOR	BCOR	BCOR	BCOR	BCOR
Crop Scientific Name	Zea mays	Zea mays	Zea mays	Zea mays	Zea mays	Zea mays	Zea mays	Zea mays	Zea mays
Crop Name	Corn	Corn	Corn	Corn	Corn	Corn	Corn	Corn	Corn
Crop Variety	Farmfire	Farmfire	Farmfire	Farmfire	Farmfire	Farmfire	Farmfire	Farmfire	Farmfire
Crop Stage Scale	BBCH	BBCH	BBCH	BBCH	BBCH	BBCH	BBCH	BBCH	BBCH
Crop Stage Majority/Min/Max	18; 16; 18	53; 51; 55	53; 51; 55	53; 51; 55	53; 51; 55	53; 51; 55	14; 12; 16	14; 12; 16	18; 16; 18
Days After First/Last Applic.	47; 47	84; 84	84; 84	84; 84	84; 84	84; 84	29; 29	29; 29	47; 47
Trt-Eval Interval	47 DA-A	84 DA-A	84 DA-A	84 DA-A	84 DA-A	84 DA-A	29 DA-A	29 DA-A	47 DA-A
Plant-Eval Interval	47 DP-1	84 DP-1	84 DP-1	84 DP-1	84 DP-1	84 DP-1	29 DP-1	29 DP-1	47 DP-1
Days After Emergence	38 DE-1	75 DE-1	75 DE-1	75 DE-1	75 DE-1	75 DE-1	20 DE-1	20 DE-1	38 DE-1
ARM Action Codes						@UPOC[11]		@UPOC[13]	
Number of Decimals						2	2	2	2
Trt Treatment	8	9	10	11	12	13	14	15	
No. Name									
Rate									
Rate Unit									
1 Untreated Check	100,0na	0,0na	100,0na	270,45a	100,00a	0,26a	100,00a	0,45a	
2 Belenus 400kg/ha	100,0na	0,0na	100,0na	272,25a	100,67a	0,27a	101,04a	0,45a	
3 Belenus 800kg/ha	100,0na	0,0na	100,0na	273,93a	101,29a	0,27a	102,96a	0,45a	
LSD P=.05									
Standard Deviation	0,00	0,00	0,00	3,061	1,149	0,010	4,054	0,010	
CV	0,0	0,0	0,0	1,769	0,664	0,006	2,343	0,006	
Grand Mean	100,00	0,00	100,00	272,208	100,654	0,266	101,332	0,451	
Levene's F	0,00*	0,00*	0,00*	0,168	3,738	7,00*	4,472*	0,273	
Rank X2									
P(Rank X2)									
Skewness									
Kurtosis				-0,3366	0,7229	-1,4552*	0,7839	-0,0862	
				0,1098	-0,4828	1,3879	1,0471	-0,1896	

Means followed by same letter or symbol do not significantly differ (P=.05, Student-Newman-Keuls).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
 Could not calculate LSD (% mean diff) or mean separation letters for columns 1,2,3,4,5,6,7,8,9,10 because error variance is 0.  
 Mean separation letters are 'na' (not applicable) when error variance is 0



Assessed By	Strzeliński	Strzeliński	Strzeliński	Strzeliński	Strzeliński	Strzeliński
Rating Date	Jun-10-2024	Jun-26-2024	Jun-26-2024	Jun-26-2024	Jun-26-2024	Oct-2-2024
Rating Time						
SE Name				Y240	Y240	O168_C3
SE Description	NDVI	NDVI	NDVI	chlorophyll con>	chlorophyll con>	Number of cobs >
Part Rated				LEAF: -	LEAF: -	COB; -
Rating Type				CONCHL	CONCHL	COPLPA
Rating Unit				UNIT	%UNCK	NUMBER
Rating Min/Max/Interval						
Sample Size	1 PLOT	1 PLOT	1 PLOT	30 LEAF	30 LEAF	20 PLANT
Collection Basis				1 PLOT	1 PLOT	1 PLOT
Reporting Basis				1 LEAF	1 LEAF	1 PLANT
Calculation				NC	NC	IN
Number of Subsamples	1	1	1	1	1	1
Crop Type, Code	C; ZEAMX	C; ZEAMX	C; ZEAMX	C; ZEAMX	C; ZEAMX	C; ZEAMX
BBCH Scale	BCOR	BCOR	BCOR	BCOR	BCOR	BCOR
Crop Scientific Name	Zea mays	Zea mays	Zea mays	Zea mays	Zea mays	Zea mays
Crop Name	Corn	Corn	Corn	Corn	Corn	Corn
Crop Variety	Farmfire	Farmfire	Farmfire	Farmfire	Farmfire	Farmfire
Crop Stage Scale	BBCH	BBCH	BBCH	BBCH	BBCH	BBCH
Crop Stage Majority/Min/Max	18; 16; 18	31; 30; 32	31; 30; 32	31; 30; 32	31; 30; 32	99; -; -
Days After First/Last Applic.	47; 47	63; 63	63; 63	63; 63	63; 63	161; 161
Trt-Eval Interval	47 DA-A	63 DA-A	63 DA-A	63 DA-A	63 DA-A	161 DA-A
Plant-Eval Interval	47 DP-1	63 DP-1	63 DP-1	63 DP-1	63 DP-1	161 DP-1
Days After Emergence	38 DE-1	54 DE-1	54 DE-1	54 DE-1	54 DE-1	152 DE-1
ARM Action Codes	@UPOC[15]		@UPOC[17]		@UPOC[19]	
Number of Decimals	2	2	2	2	2	2
Trt Treatment	16	17	18	19	20	21
No. Name						
Rate Unit						
1 Untreated Check	100,00a	0,65a	100,00a	680,8a	100,00a	1,420a
2 Belenus 400kg/ha	100,01a	0,66a	101,15a	686,8a	100,92a	1,378a
3 Belenus 800kg/ha	100,57a	0,67a	102,31a	699,0a	102,71a	1,418a
LSD P=.05	2,124	0,012	1,829	25,49	3,738	0,0847
Standard Deviation	1,228	0,007	1,057	14,73	2,160	0,0490
CV	1,23	1,04	1,05	2,14	2,13	3,48
Grand Mean	100,193	0,660	101,154	688,83	101,209	1,4050
Levene's F	1,249	3,50	5,571*	0,293	7,381*	0,424
Rank X2						
P(Rank X2)						
Skewness	0,2925	1,0553	1,3189*	-0,1162	0,4489	0,7056
Kurtosis	2,1491	1,925	1,4082	0,1712	-0,3902	0,0134

Means followed by same letter or symbol do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Could not calculate LSD (% mean diff) or mean separation letters for columns 1,2,3,4,5,6,7,8,9,10 because error variance is 0.

Mean separation letters are 'na' (not applicable) when error variance is 0

Assessed By	Strzeński	Strzeński	Strzeński	Strzeński	Strzeński
Rating Date	Oct-2-2024	Oct-2-2024	Oct-2-2024	Oct-2-2024	Oct-2-2024
Rating Time					
SE Name	O168_C3	O168_C3	O168_C3	O168_C3	O168_C3
SE Description	Number of cobs >	Number of rows >	Number of rows >	Number of floor>	Number of floor >
Part Rated	COB; -	COB; -	COB; -	COB; -	COB; -
Rating Type	COPLPA	COPLPA	COPLPA	COPLPA	COPLPA
Rating Unit	NUMBER	NUMBER	NUMBER	NUMBER	NUMBER
Rating Min/Max/Interval					
Sample Size	20 PLANT	20 COB	20 COB	20 COB	20 COB
Collection Basis	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT
Reporting Basis	1 PLANT	1 PLANT	1 PLANT	1 PLANT	1 PLANT
Calculation	IN	IN	IN	IN	IN
Number of Subsamples	1	1	1	1	1
Crop Type, Code	C; ZEAMX	C; ZEAMX	C; ZEAMX	C; ZEAMX	C; ZEAMX
BBCH Scale	BCOR	BCOR	BCOR	BCOR	BCOR
Crop Scientific Name	Zea mays	Zea mays	Zea mays	Zea mays	Zea mays
Crop Name	Corn	Corn	Corn	Corn	Corn
Crop Variety	Farmfire	Farmfire	Farmfire	Farmfire	Farmfire
Crop Stage Scale	BBCH	BBCH	BBCH	BBCH	BBCH
Crop Stage Majority/Min/Max	99; -; -	99; -; -	99; -; -	99; -; -	99; -; -
Days After First/Last Applic.	161; 161	161; 161	161; 161	161; 161	161; 161
Trt-Eval Interval	161 DA-A	161 DA-A	161 DA-A	161 DA-A	161 DA-A
Plant-Eval Interval	161 DP-1	161 DP-1	161 DP-1	161 DP-1	161 DP-1
Days After Emergence	152 DE-1	152 DE-1	152 DE-1	152 DE-1	152 DE-1
ARM Action Codes	@UPOC[21]		@UPOC[23]		@UPOC[25]
Number of Decimals	2		2		2
Trt Treatment					
No. Name	22	23	24	25	26
Rate					
Rate Unit					
1 Untreated Check	100,00a	15,95a	100,00a	37,53a	100,00a
2 Belenus 400kg/ha	97,10a	16,20a	101,61a	37,95a	101,14a
3 Belenus 800kg/ha	99,98a	16,40a	102,84a	38,33a	102,15a
LSD P=.05	5,853	0,346	2,235	0,618	1,680
Standard Deviation	3,383	0,200	1,292	0,357	0,971
CV	3,42	1,24	1,27	0,94	0,96
Grand Mean	99,028	16,183	101,484	37,933	101,098
Levene's F	2,508	0,973	1,935	2,161	2,004
Rank X2					
P(Rank X2)					
Skewness	-0,6776	-1,2372	0,944	-1,018	1,2379
Kurtosis	0,3078	4,0143*	-0,3227	0,3301	1,429

Means followed by same letter or symbol do not significantly differ (P=.05, Student-Newman-Keuls).  
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) or mean separation letters for columns 1,2,3,4,5,6,7,8,9,10 because error variance is 0.  
Mean separation letters are 'na' (not applicable) when error variance is 0

Assessed By	Strzeliński	Strzeliński	Strzeliński	Strzeliński	Strzeliński	Strzeliński	Strzeliński	Strzeliński
Rating Date	Oct-2-2024	Oct-2-2024	Oct-2-2024	Oct-2-2024	Oct-2-2024	Oct-2-2024	Oct-2-2024	Oct-7-2024
Rating Time								
SE Name	O168_C3	O168_C3						
SE Description	Number of grain>	Number of grain>						
Part Rated	COB; -	COB; -						
Rating Type	COPLPA	COPLPA	WEIFRE	MOICON	YIELD	YIELD	TKW	
Rating Unit	NUMBER	NUMBER	kg	%	T-MET	T-MET	g	
Rating Min/Max/Interval				0; 100; -				
Sample Size	20 COB	20 COB	15 m2	1 PLOT	1 ha	1 ha	1000 GRAIN	
Collection Basis	1 PLOT	1 PLOT						
Reporting Basis	1 PLANT	1 PLANT						
Calculation	IN	IN						
Number of Subsamples	1	1	1	1	1	1	1	1
Crop Type, Code	C; ZEAMX	C; ZEAMX	C; ZEAMX	C; ZEAMX	C; ZEAMX	C; ZEAMX	C; ZEAMX	C; ZEAMX
BBCH Scale	BCOR	BCOR	BCOR	BCOR	BCOR	BCOR	BCOR	BCOR
Crop Scientific Name	Zea mays	Zea mays	Zea mays	Zea mays	Zea mays	Zea mays	Zea mays	Zea mays
Crop Name	Corn	Corn	Corn	Corn	Corn	Corn	Corn	Corn
Crop Variety	Farmfire	Farmfire	Farmfire	Farmfire	Farmfire	Farmfire	Farmfire	Farmfire
Crop Stage Scale	BBCH	BBCH	BBCH	BBCH	BBCH	BBCH	BBCH	BBCH
Crop Stage Majority/Min/Max	99; -; -	99; -; -						
Days After First/Last Applic.	161; 161	161; 161	161; 161	161; 161	161; 161	161; 161	161; 161	166; 166
Trt-Eval Interval	161 DA-A	161 DA-A	161 DA-A	161 DA-A	161 DA-A	161 DA-A	161 DA-A	166 DA-A
Plant-Eval Interval	161 DP-1	161 DP-1	161 DP-1	161 DP-1	161 DP-1	161 DP-1	161 DP-1	166 DP-1
Days After Emergence	152 DE-1	152 DE-1	152 DE-1	152 DE-1	152 DE-1	152 DE-1	152 DE-1	157 DE-1
ARM Action Codes		@UPOC[27]			TY1	@UPOC[31]		
Number of Decimals		2	1	1	1	1	1	1
Trt Treatment	27	28	29	30	31	32	33	
No. Name								
Rate Unit								
1 Untreated Check	574,085b	100,00b	16,0b	28,6a	12,2b	100,0b	377,7a	
2 Belenus 400kg/ha	588,428ab	102,61ab	16,5b	28,6a	12,6b	103,3b	377,7a	
3 Belenus 800kg/ha	617,608a	107,68a	17,2a	28,6a	13,2a	107,8a	380,6a	
LSD P=.05	30,9424	5,507	0,56	0,30	0,45	3,70	10,84	
Standard Deviation	17,8834	3,183	0,33	0,17	0,26	2,14	6,27	
CV	3,01	3,08	1,97	0,61	2,03	2,06	1,65	
Grand Mean	593,3734	103,433	16,57	28,58	12,68	103,70	378,67	
Levene's F	0,34	70,014*	1,336	2,657	0,855	2,711	0,259	
Rank X2								
P(Rank X2)								
Skewness	0,4414	0,9838	0,4641	0,4994	0,4066	0,7652	-0,2225	
Kurtosis	0,4521	-0,2593	-0,842	0,2275	-1,0176	-0,981	-1,4525	

Means followed by same letter or symbol do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Could not calculate LSD (% mean diff) or mean separation letters for columns 1,2,3,4,5,6,7,8,9,10 because error variance is 0.

Mean separation letters are 'na' (not applicable) when error variance is 0

Assessed By	Strzeński	Strzeński	Strzeński
Rating Date	Oct-7-2024	Oct-7-2024	Oct-7-2024
Rating Time			
SE Name			
SE Description			
Part Rated			
Rating Type	TKW	HLW	HLW
Rating Unit	g	kg	kg
Rating Min/Max/Interval			
Sample Size	1000 GRAIN	100 L	100 L
Collection Basis			
Reporting Basis			
Calculation			
Number of Subsamples	1	1	1
Crop Type, Code	C; ZEAMX	C; ZEAMX	C; ZEAMX
BBCH Scale	BCOR	BCOR	BCOR
Crop Scientific Name	Zea mays	Zea mays	Zea mays
Crop Name	Corn	Corn	Corn
Crop Variety	Farmfire	Farmfire	Farmfire
Crop Stage Scale	BBCH	BBCH	BBCH
Crop Stage Majority/Min/Max			
Days After First/Last Applic.	166; 166	166; 166	166; 166
Trt-Eval Interval	166 DA-A	166 DA-A	166 DA-A
Plant-Eval Interval	166 DP-1	166 DP-1	166 DP-1
Days After Emergence	157 DE-1	157 DE-1	157 DE-1
ARM Action Codes	@UPOC[33]		@UPOC[35]
Number of Decimals	1	1	1
Trt Treatment			
No. Name	Rate	Rate	Rate
	Rate Unit	Rate Unit	Rate Unit
1 Untreated Check	100,0a	66,8a	100,0a
2 Belenus 400kg/ha	100,0a	67,6a	101,3a
3 Belenus 800kg/ha	100,8a	66,9a	100,2a
LSD P=.05	2,87	2,83	4,23
Standard Deviation	1,66	1,63	2,44
CV	1,65	2,44	2,43
Grand Mean	100,27	67,10	100,49
Levene's F	1,573	1,065	3,443
Rank X2			
P(Rank X2)			
Skewness	-0,4686	-0,6207	-0,195
Kurtosis	1,5771	-0,7931	0,629

Means followed by same letter or symbol do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Could not calculate LSD (% mean diff) or mean separation letters for columns 1,2,3,4,5,6,7,8,9,10 because error variance is 0.

Mean separation letters are 'na' (not applicable) when error variance is 0

Part Rated

PLANT = plant  
LEAF = leaf  
COB = cob

Rating Type

PHYGEN = phytotoxicity - general / injury  
VIGOR = vigor  
HEIGHT = height  
CONCHL = content - chlorophyll  
COPLPA = count - plant part  
WEIFRE = weight - fresh  
MOICON = moisture content  
YIELD = yield  
TKW = weight thousand kernel  
HLW = weight 100 Ltr (hl)

Rating Unit

%, 0, 100, = percent  
CM, , , = centimeter  
%UNCK, , , = percent of untreated check  
NUMBER, , , = number  
kg, , , = kilogram  
T-MET, , , = ton (metric=1000 kg)  
g, , , = gram

PLOT = total plot  
PLANT = plant/plant biomass/shrub  
LEAF = leaf  
COB = cob  
m2 = square meter  
ha = hectare  
GRAIN = grain  
L = liter

PLOT = total plot

PLANT = plant/plant biomass/shrub  
LEAF = leaf

Calculation

IN = increase  
NC = no calculation

Crop Type, Code

C = EPPO species (Bayer) codes  
ZEAMX, BCOR, Zea mays, Corn = US

Crop Stage Scale

BBCH = BBCH uniform plant stages

Crop Stage Majority/Min/Max

11 = First leaf unfolded (V1 = First Leaf)  
14 = 4 leaves unfolded (V4 = Fourth Leaf)  
16 = 6 leaves unfolded (V6 = Sixth Leaf)  
18 = 8 leaves unfolded (V8 = Eighth Leaf)  
53 = Tip of tassel visible  
31 = First node detectable  
99 = Harvested product  
12 = 2 leaves unfolded (V2= Second Leaf)  
15 = 5 leaves unfolded (V5 = Fifth Leaf)  
51 = Beginning of tassel emergence: tassel detectable at tip of stem (VT = Tassle)  
30 = Beginning of stem elongation  
55 = Middle of tassel emergence: middle of tassel begins to separate  
32 = 2 nodes detectable

Plant-Eval Interval

16 DP-1 = 1 ZEAMX Apr-24-2024  
29 DP-1 = 1 ZEAMX Apr-24-2024  
40 DP-1 = 1 ZEAMX Apr-24-2024  
47 DP-1 = 1 ZEAMX Apr-24-2024  
84 DP-1 = 1 ZEAMX Apr-24-2024  
63 DP-1 = 1 ZEAMX Apr-24-2024  
161 DP-1 = 1 ZEAMX Apr-24-2024  
166 DP-1 = 1 ZEAMX Apr-24-2024

ARM Action Codes

@UPOC[11] = &100\*@AvgSub([11])/[TUC11]  
@UPOC[13] = &100\*@AvgSub([13])/[TUC13]  
@UPOC[15] = &100\*@AvgSub([15])/[TUC15]  
@UPOC[17] = &100\*@AvgSub([17])/[TUC17]  
@UPOC[19] = &100\*@AvgSub([19])/[TUC19]  
@UPOC[21] = &100\*@AvgSub([21])/[TUC21]  
@UPOC[23] = &100\*@AvgSub([23])/[TUC23]  
@UPOC[25] = &100\*@AvgSub([25])/[TUC25]

@UPOC[27] = &100\*@AvgSub([27])/[TUC27]  
TY1 = 0.75\*[C29]\*(100-[C30])/70  
@UPOC[31] = &100\*@AvgSub([31])/[TUC31]  
@UPOC[33] = &100\*@AvgSub([33])/[TUC33]  
@UPOC[35] = &100\*@AvgSub([35])/[TUC35]

## Conclusions:

### General observations

Location: west part of Poland with continental climate. Weather conditions during the trial period were typical for the trial region. No effects on non-target organisms were observed.

We do not observed phytotoxicity.

The experiment was set up in a field where no fertilization had been applied in previous years.

After applying the Belenus fertilizer at a dose of 400 kg/ha, an increase in the number of grains in cobs by 2.61% was observed, while after applying the Belenus fertilizer at a dose of 800 kg/ha, an increase in the number of grains in cobs by 7.68% was observed.

Belenus used in dose 400 kg/ha resulted in an increase in yield by 3,3% and Belenus used in dose 800 kg/ha resulted in an increase in yield by 7,8%.

### Statement of compliance

All data in this ARM file represent a true and accurate record of the results obtained.

This report is created electronically using the original data and valid without signature.

### Ogólne obserwacje

Położenie: zachodnia część Polski o klimacie kontynentalnym. Warunki pogodowe w okresie trwania doświadczenia były typowe dla regionu badawczego.

Nie zaobserwowano żadnego wpływu na organizmy inne niż docelowe.

Nie zaobserwowano fitotoksyczności.

Doświadczenie zostało założone na polu, na którym w poprzednich latach nie stosowano nawożenia.

Po zastosowaniu nawozu Belenus w dawce 400 kg/ha zaobserwowano wzrost ilości ziaren w kolbach o 2,61%, natomiast po zastosowaniu nawozu Belenus w dawce 800 kg/ha zaobserwowano wzrost ilości ziaren w kolbach o 7,68%.

Belenus zastosowany w dawce 400 kg/ha spowodował wzrost plonów o 3,3% natomiast Belenus zastosowany w dawce 800 kg/ha spowodował wzrost plonów o 7,8%.

### Oświadczenie o zgodności

Wszystkie dane w tym pliku ARM stanowią prawdziwy i dokładny zapis uzyskanych wyników.

Niniejszy raport tworzony jest w formie elektronicznej z wykorzystaniem oryginalnych danych i jest ważny bez podpisu.

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