

Study of the influence of fertilizers on sugar beet growth and yield

Badanie wpływu nawozów na wzrost i plonowanie buraka cukrowego

Trial season: 2023/2024
Trial ID: PL24FERTGOUDENKORREL_BEAVA
Research number: 7/2024
Trial code: AP/24/BC/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 buraka cukrowego

Trial ID: PL24FERTGOUDENKORREL_BEAVA
 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	Unit
1	Untreated Check	not treated		
2	Belenus		400kg/ha	
3	Belenus		800kg/ha	

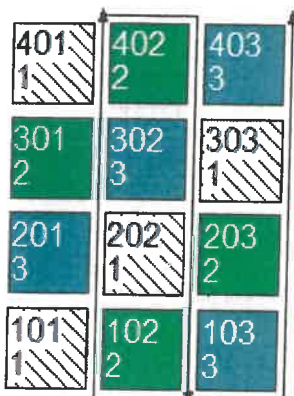
Replications: 4, Untreated treatments: 1, Design: Randomized Complete Block (RCB), Treatment units: Treated 'Plot' experimental unit size, Dry Form. Unit: %, Treated 'Plot' experimental unit size Width: 3 meters, Treated 'Plot' experimental unit size Length: 10 meters, Application amount: 200 L/ha, Mix 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-9-2024
 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

Role: STYDIR study director
Study Director: Artur Strzeliński
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Address 1: Wojska Polskiego 28
Country: POL Poland
City: Poznań
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Role: INVEST investigator
Investigator: Artur Strzeliński
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Address 1: Wojska Polskiego 28
Country: POL Poland
City: Poznań
E-mail: artur.strzelinski@up.poznan.pl
State/Prov: 30 **Postal Code:** 60-637
Role: SPONSR sponsor
Sponsor: Gouden Korrel

Crop Description

Crop 1: C BEAVA Beta vulgaris vulg. altissima
Entry Date: Nov-20-2024
Variety: Klara
Planting Date: Apr-9-2024
Depth: 2 cm
Row Spacing: 45 cm
Emergence Date: Apr-19-2024
Harvest Date: Sep-11-2024
Sugarbeet
Stage Scale: BBCH
BBCH Scale: BSUG
Planting Rate: 110000 S/ha
Planting Method: DRILLE drilled
Planting Equipment: SR drilling machine
Seed Bed: FINE fine
Soil Moisture: GOOD good
Harvested Width: 0,9 m
Harvested Length: 10 m

Site and Design

Treated Plot Width: 3 m
Treated Plot Length: 10 m
Treated Plot Area: 30,0 m²
Replications: 4 **Treatments:** 3 **Plots:** 12
Distance between Blocks: 0 m
Distance between 'Plot' Experimental Units: 0 m
Site Type: FIELD field
Experimental Unit: 1 PLOT plot
Tillage Type: CONTIL conventional-till
Study Design: RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	HORVS	2023

Maintenance

No.	Date	Type	Maintenance Product Name	Rate	Rate Unit	Comment
1.	Apr-3-2024	FERT	Polidap	150	kg/ha	N - 18; P - 46 / 100kg
2.	Apr-3-2024	FERT	Saletra amonowa	200	kg/ha	N - 34 / 100kg
3.	Apr-19-2024	HERB	Goltix Titan	1,5	l/ha	
4.	Apr-19-2024	HERB	Powertwin	1,0	l/ha	
5.	Apr-19-2024	ADJ	Insert	0,1	l/ha	
6.	Apr-28-2024	HERB	Goltix Titan	1,5	l/ha	
7.	Apr-28-2024	HERB	Powertwin	1,0	l/ha	
8.	Apr-28-2024	ADJ	Insert	0,1	l/ha	
9.	May-16-2024	HERB	Goltix Titan	1,5	l/ha	
10.	May-16-2024	HERB	Powertwin	1,0	l/ha	
11.	May-16-2024	ADJ	Insert	0,1	l/ha	
12.	May-24-2024	INSE	Mospilan	0,2	kg/ha	
13.	Jul-3-2024	FUNG	Spyrale	1,0	l/ha	
14.	Aug-5-2024	FUNG	Spyrale	1,0	l/ha	

Soil Description

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

Weather Conditions

Weather Station Name: Złotniki **Code:** 62-002 **Distance:** 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-9-2024
Start Time	11:20 AM
Stop Time	11:40 AM
Method	SPREAD
Timing	00
Placement	SOIL
Applied By	Dawid Wadziński
Entry Date	Nov-20-2024
Air Temperature Start, Stop	19,1; 19,1 C
% Relative Humidity Start, Stop	54; 54
Wind Velocity+Dir. Start	0,6 MPS; NW
Wind Velocity+Dir. Stop	0,6 MPS; NW
Wind Velocity+Dir. Max	0,6 MPS; NW
Soil Temperature	21,7 C
Soil Moisture	NORMAL
% Cloud Cover	75
First Moisture Occurred On	Apr-14-2024
Time to First Moisture	5,0 DAY
Amount of First Moisture	9,4 mm
Moisture 1 Week Before Appl.	10,6 mm
Moisture 6 Hours After Appl.	0 mm
Moisture 24 Hours After Appl.	0 mm
Moisture 1 Week After Appl.	15,1 mm
Problems with Application?	N; no

Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale	BEAVA; BSUG
Days after Emergence	-10
Stage Majority, Percent	00; 100
Stage Minimum, Percent	00; 0
Stage Maximum, Percent	00; 0

Application Equipment

	A
Equipment Type	MANSPR
% Coverage	100

RESULTS:						
Assessed By	Strzeleński	Strzeleński	Strzeleński	Strzeleński	Strzeleński	Strzeleński
Rating Date	Apr-22-2024	Apr-22-2024	May-20-2024	May-20-2024	May-20-2024	May-20-2024
SE Name						
SE Description					NDVI	NDVI
Part Rated						
Rating Type	PHYGEN	VIGOR	PHYGEN	VIGOR		
Rating Unit	%	%	%	%		
Rating Min/Max/Interval	0; 100; -	0; 100; -	0; 100; -	0; 100; -		
Sample Size	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT
Collection Basis						
Reporting Basis						
Calculation						
Number of Subsamples	1	1	1	1	1	1
Crop Type, Code	C; BEAVA	C; BEAVA	C; BEAVA	C; BEAVA	C; BEAVA	C; BEAVA
BBCH Scale	BSUG	BSUG	BSUG	BSUG	BSUG	BSUG
Crop Scientific Name	Beta vulgaris v>	Beta vulgaris v>	Beta vulgaris v>	Beta vulgaris v>	Beta vulgaris v>	Beta vulgaris v>
Crop Name	Sugarbeet	Sugarbeet	Sugarbeet	Sugarbeet	Sugarbeet	Sugarbeet
Crop Variety	Klara	Klara	Klara	Klara	Klara	Klara
Crop Stage Scale	BBCH	BBCH	BBCH	BBCH	BBCH	BBCH
Crop Stage Majority/Min/Max	12; 11; 12	12; 11; 12	19; 19; 31	19; 19; 31	19; 19; 31	19; 19; 31
Crop Density						
Pest Stage Majority/Min/Max						
Pest Density						
Rating Timing						
Days After First/Last Applic.	13; 13	13; 13	41; 41	41; 41	41; 41	41; 41
Trt-Eval Interval	13 DA-A	13 DA-A	41 DA-A	41 DA-A	41 DA-A	41 DA-A
Plant-Eval Interval	13 DP-1	13 DP-1	41 DP-1	41 DP-1	41 DP-1	41 DP-1
Days After Emergence	3 DE-1	3 DE-1	31 DE-1	31 DE-1	31 DE-1	31 DE-1
Description						
ARM Action Codes						
Number of Decimals						@UPOC[5]
Trt Treatment	1	2	3	4	5	6
No. Name						
Rate						
Rate Unit						
1 Untreated Check	0,0na	100,0na	0,0na	100,0na	0,61a	100,00a
2 Belenus 400kg/ha	0,0na	100,0na	0,0na	100,0na	0,61a	100,01a
3 Belenus 800kg/ha	0,0na	100,0na	0,0na	100,0na	0,61a	100,83a
LSD P=.05						
Standard Deviation	0,00	0,00	0,00	0,00	0,013	2,123
CV	0,0	0,0	0,0	0,0	0,007	1,227
Grand Mean	0,00	100,00	0,00	100,00	1,23	1,22
Levene's F	0,00*	0,00*	0,00*	0,00*	0,607	100,280
Rank X2					1,50	1,517
P(Rank X2)						
Skewness						
Kurtosis					-0,1387	-1,164
					-0,2538	1,2956

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 1,2,3,4,7,8,11,12,17,18 because error variance is 0.
 Mean separation letters are 'na' (not applicable) when error variance is 0

Assessed By	Strzeliński Jun-6-2024	Strzeliński Jun-6-2024	Strzeliński Jun-6-2024	Strzeliński Jun-6-2024	Strzeliński Jul-3-2024	Strzeliński Jul-3-2024
Rating Date						
SE Name						
SE Description			NDVI	NDVI		
Part Rated						
Rating Type	PHYGEN	VIGOR			PHYGEN	VIGOR
Rating Unit	%	%			%	%
Rating Min/Max/Interval	0; 100; -	0; 100; -			0; 100; -	0; 100; -
Sample Size	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT
Collection Basis						
Reporting Basis						
Calculation						
Number of Subsamples	1	1	1	1	1	1
Crop Type, Code	C; BEAVA	C; BEAVA	C; BEAVA	C; BEAVA	C; BEAVA	C; BEAVA
BBCH Scale	BSUG	BSUG	BSUG	BSUG	BSUG	BSUG
Crop Scientific Name	Beta vulgaris v>	Beta vulgaris v>	Beta vulgaris v>	Beta vulgaris v>	Beta vulgaris v>	Beta vulgaris v>
Crop Name	Sugarbeet	Sugarbeet	Sugarbeet	Sugarbeet	Sugarbeet	Sugarbeet
Crop Variety	Klara	Klara	Klara	Klara	Klara	Klara
Crop Stage Scale	BBCH	BBCH	BBCH	BBCH	BBCH	BBCH
Crop Stage Majority/Min/Max	33; 33; 33	33; 33; 33	33; 33; 33	33; 33; 33	39; 39; 39	39; 39; 39
Crop Density						
Pest Stage Majority/Min/Max						
Pest Density						
Rating Timing						
Days After First/Last Applic.	58; 58	58; 58	58; 58	58; 58	85; 85	85; 85
Trt-Eval Interval	58 DA-A	58 DA-A	58 DA-A	58 DA-A	85 DA-A	85 DA-A
Plant-Eval Interval	58 DP-1	58 DP-1	58 DP-1	58 DP-1	85 DP-1	85 DP-1
Days After Emergence	48 DE-1	48 DE-1	48 DE-1	48 DE-1	75 DE-1	75 DE-1
Description						
ARM Action Codes				@UPOC[9]		
Number of Decimals			2	2		
Trt Treatment	7	8	9	10	11	12
No. Name						
Rate						
Rate Unit						
1 Untreated Check	0,0na	100,0na	0,81b	100,00b	0,0na	100,0na
2 Belenus 400kg/ha	0,0na	100,0na	0,82ab	100,94ab	0,0na	100,0na
3 Belenus 800kg/ha	0,0na	100,0na	0,83a	102,17a	0,0na	100,0na
LSD P=.05			0,013	1,561		
Standard Deviation	0,00	0,00	0,007	0,902	0,00	0,00
CV	0,0	0,0	0,89	0,89	0,0	0,0
Grand Mean	0,00	100,00	0,818	101,037	0,00	100,00
Levene's F	0,00*	0,00*	0,30	1,247	0,00*	0,00*
Rank X2						
P(Rank X2)						
Skewness			-0,412	0,4011		
Kurtosis			-0,2982	-0,7998		

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 1,2,3,4,7,8,11,12,17,18 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	Jul-3-2024	Jul-3-2024	Jul-3-2024	Jul-3-2024	Jul-3-2024	Aug-26-2024
SE Name			Y240	Y240		
SE Description	NDVI	NDVI	chlorophyll con>	chlorophyll con>		
Part Rated			LEAF; -	LEAF; -		
Rating Type			CONCHL	CONCHL	PHYGEN	VIGOR
Rating Unit			UNIT	%UNCK	%	%
Rating Min/Max/Interval					0; 100; -	0; 100; -
Sample Size	1 PLOT	1 PLOT	30 LEAF	30 LEAF	1 PLOT	1 PLOT
Collection Basis			1 PLOT	1 PLOT		
Reporting Basis			1 LEAF	1 LEAF		
Calculation			NC	NC		
Number of Subsamples	1	1	1	1	1	1
Crop Type, Code	C; BEAVA	C; BEAVA	C; BEAVA	C; BEAVA	C; BEAVA	C; BEAVA
BBCH Scale	BSUG	BSUG	BSUG	BSUG	BSUG	BSUG
Crop Scientific Name	Beta vulgaris v>	Beta vulgaris v>	Beta vulgaris v>	Beta vulgaris v>	Beta vulgaris v>	Beta vulgaris v>
Crop Name	Sugarbeet	Sugarbeet	Sugarbeet	Sugarbeet	Sugarbeet	Sugarbeet
Crop Variety	Klara	Klara	Klara	Klara	Klara	Klara
Crop Stage Scale	BBCH	BBCH	BBCH	BBCH	BBCH	BBCH
Crop Stage Majority/Min/Max	39; 39; 39	39; 39; 39	39; 39; 39	39; 39; 39	49; 49; 49	49; 49; 49
Crop Density						
Pest Stage Majority/Min/Max						
Pest Density						
Rating Timing						
Days After First/Last Applic.	85; 85	85; 85	85; 85	85; 85	139; 139	139; 139
Trt-Eval Interval	85 DA-A	85 DA-A	85 DA-A	85 DA-A	139 DA-A	139 DA-A
Plant-Eval Interval	85 DP-1	85 DP-1	85 DP-1	85 DP-1	139 DP-1	139 DP-1
Days After Emergence	75 DE-1	75 DE-1	75 DE-1	75 DE-1	129 DE-1	129 DE-1
Description						
ARM Action Codes		@UPOC[13]		@UPOC[15]		
Number of Decimals	2	2	2	2	2	2
Trt Treatment						
Rate	13	14	15	16	17	18
No. Name						
Rate Unit						
1 Untreated Check	0,82a	100,00a	746,3a	100,00a	0,0na	100,0na
2 Belenus 400kg/ha	0,82a	99,71a	754,3a	101,20a	0,0na	100,0na
3 Belenus 800kg/ha	0,83a	100,91a	761,0a	102,00a	0,0na	100,0na
LSD P=.05	0,010	1,161	53,88	7,126		
Standard Deviation	0,006	0,671	31,14	4,118	0,00	0,00
CV	0,67	0,67	4,13	4,07	0,0	0,0
Grand Mean	0,824	100,207	753,83	101,068	0,00	100,00
Levene's F	3,00	3,471	0,423	1,558	0,00*	0,00*
Rank X2						
P(Rank X2)						
Skewness	0,3251	-0,2429	-0,0726	-0,94		
Kurtosis	0,3334	-0,71	-1,639	2,527*		

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 1,2,3,4,7,8,11,12,17,18 because error variance is 0.

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

Assessed By	Strzeliński Aug-26-2024	Strzeliński Aug-26-2024	Strzeliński Aug-26-2024	Strzeliński Aug-26-2024	Nov-4-2024	Nov-4-2024
Rating Date						
SE Name			Y240	Y240		
SE Description	NDVI	NDVI	chlorophyll con>	chlorophyll con>		
Part Rated			LEAF; -	LEAF; -	YIELD; C	YIELD; C
Rating Type			CONCHL	CONCHL	YIELD	YIELD
Rating Unit			UNIT	%UNCK	kg	T-MET
Rating Min/Max/Interval						
Sample Size	1 PLOT	1 PLOT	30 LEAF	30 LEAF	14 m2	1 ha
Collection Basis			1 PLOT	1 PLOT	1 PLOT	1 PLOT
Reporting Basis			1 LEAF	1 LEAF	14 m2	1 ha
Calculation			NC	NC		
Number of Subsamples	1	1	1	1	1	1
Crop Type, Code	C; BEAVA	C; BEAVA	C; BEAVA	C; BEAVA	C; BEAVA	C; BEAVA
BBCH Scale	BSUG	BSUG	BSUG	BSUG	BSUG	BSUG
Crop Scientific Name	Beta vulgaris v>	Beta vulgaris v>	Beta vulgaris v>	Beta vulgaris v>	Beta vulgaris v>	Beta vulgaris v>
Crop Name	Sugarbeet	Sugarbeet	Sugarbeet	Sugarbeet	Sugarbeet	Sugarbeet
Crop Variety	Klara	Klara	Klara	Klara	Klara	Klara
Crop Stage Scale	BBCH	BBCH	BBCH	BBCH	BBCH	BBCH
Crop Stage Majority/Min/Max	49; 49; 49	49; 49; 49	49; 49; 49	49; 49; 49	49; 49; 49	49; 49; 49
Crop Density					0 %	0 %
Pest Stage Majority/Min/Max					NA; -; -	NA; -; -
Pest Density					0 %	0 %
Rating Timing					harvest	harvest
Days After First/Last Applic.	139; 139	139; 139	139; 139	139; 139	209; 209	209; 209
Trt-Eval Interval	139 DA-A	139 DA-A	139 DA-A	139 DA-A	209 DA-A	209 DA-A
Plant-Eval Interval	139 DP-1	139 DP-1	139 DP-1	139 DP-1	209 DP-1	209 DP-1
Days After Emergence	129 DE-1	129 DE-1	129 DE-1	129 DE-1	199 DE-1	199 DE-1
Description					kg/plot	t/ha
ARM Action Codes		@UPOC[19]		@UPOC[21]		T1
Number of Decimals	2	2		2	2	2
Trt Treatment						
No. Name						
Rate	19	20	21	22	23	24
Rate Unit						
1 Untreated Check	0,74a	100,00a	644,8a	100,00a	72,74a	80,82a
2 Belenus 400kg/ha	0,74a	100,06a	654,3a	101,57a	73,96a	82,18a
3 Belenus 800kg/ha	0,76a	102,45a	663,3a	102,97a	75,95a	84,38a
LSD P=.05	0,031	4,348	27,01	4,338	3,920	4,356
Standard Deviation	0,018	2,513	15,61	2,507	2,266	2,517
CV	2,44	2,49	2,39	2,47	3,05	3,05
Grand Mean	0,746	100,834	654,08	101,515	74,215	82,461
Levene's F	0,042	1,225	0,525	1,712	1,456	1,456
Rank X2						
P(Rank X2)						
Skewness	-1,0068	1,3644*	-0,0651	1,5598*	0,7799	0,7799
Kurtosis	0,9926	3,3867*	-0,1004	1,6526	-0,752	-0,752

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 1,2,3,4,7,8,11,12,17,18 because error variance is 0.

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

Assessed By			
Rating Date	Nov-4-2024	Nov-4-2024	Nov-4-2024
SE Name		Y026	Y026
SE Description		% sugar content>	% sugar content>
Part Rated	YIELD; C	ROOT; -	ROOT; -
Rating Type	YIELD	CONSUG	CONSUG
Rating Unit	%UNCK	%	%
Rating Min/Max/Interval	0; -; -	0; 100; -	0; 100; -
Sample Size	1 ha	1 PLOT	1 PLOT
Collection Basis	1 PLOT	1 PLOT	1 PLOT
Reporting Basis	1 ha	1 PLOT	1 PLOT
Calculation		IN	IN
Number of Subsamples	1	1	1
Crop Type, Code	C; BEAVA		
BBCH Scale	BSUG		
Crop Scientific Name	Beta vulgaris v>		
Crop Name	Sugarbeet		
Crop Variety	Klara		
Crop Stage Scale	BBCH		
Crop Stage Majority/Min/Max	49; 49; 49		
Crop Density	0 %		
Pest Stage Majority/Min/Max	NA; -; -		
Pest Density	0 %		
Rating Timing	harvest		
Days After First/Last Applic.	209; 209	209; 209	209; 209
Trt-Eval Interval	209 DA-A	209 DA-A	209 DA-A
Plant-Eval Interval	209 DP-1	209 DP-1	209 DP-1
Days After Emergence	199 DE-1	199 DE-1	199 DE-1
Description	yield %UNCK		
ARM Action Codes	@UPOC[24]		@UPOC[26]
Number of Decimals	2		2
Trt Treatment	Rate	25	26
No. Name	Rate Unit		27
1 Untreated Check		100,00a	16,63a
2 Belenus	400kg/ha	101,72a	16,65a
3 Belenus	800kg/ha	104,39a	16,68a
LSD P=.05		5,362	0,272
Standard Deviation		3,099	0,157
CV		3,04	0,94
Grand Mean		102,036	16,650
Levene's F		6,715*	0,409
Rank X2			
P(Rank X2)			
Skewness		0,8983	0,189
Kurtosis		-0,3463	-1,4465
			3,1375*

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 1,2,3,4,7,8,11,12,17,18 because error variance is 0.

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

Part Rated

LEAF = leaf
YIELD = yield
ROOT = root
C = Crop is Part Rated

Rating Type

PHYGEN = phytotoxicity - general / injury
VIGOR = vigor
CONCHL = content - chlorophyll
YIELD = yield
CONSUG = content - sugar

Rating Unit

%, 0, 100, = percent
%UNCK, , , = percent of untreated check
kg, , , = kilogram
T-MET, , , = ton (metric=1000 kg)
%UNCK, 0, , = percent of untreated check

PLOT = total plot
LEAF = leaf
m2 = square meter
ha = hectare

PLOT = total plot

LEAF = leaf
m2 = square meter
ha = hectare
PLOT = total plot

Calculation

NC = no calculation
IN = increase

Crop Type, Code

C = EPPO species (Bayer) codes
BEAVA, BSUG, Beta vulgaris vulg. altissima, Sugarbeet = US

Crop Stage Scale

BBCH = BBCH uniform plant stages

Crop Stage Majority/Min/Max

12 = 2 leaves (first pair of leaves) unfolded
19 = 9 and more leaves unfolded
33 = Leaves cover 30% of ground
39 = Crop cover complete: leaves cover 90% of ground
49 = Beet-root has reached harvestable size
11 = First pair of leaves visible, not yet unfolded (pea-size)
31 = Beginning of crop cover: leaves cover 10% of ground

% = 0-100 index/scale such as ground cover

% = 0-100 index/scale such as ground cover

Plant-Eval Interval

13 DP-1 = 1 BEAVA Apr-9-2024
41 DP-1 = 1 BEAVA Apr-9-2024
58 DP-1 = 1 BEAVA Apr-9-2024
85 DP-1 = 1 BEAVA Apr-9-2024
139 DP-1 = 1 BEAVA Apr-9-2024
209 DP-1 = 1 BEAVA Apr-9-2024

ARM Action Codes

@UPOC[5] = &100*@AvgSub([5])/[TUC5]
@UPOC[9] = &100*@AvgSub([9])/[TUC9]
@UPOC[13] = &100*@AvgSub([13])/[TUC13]
@UPOC[15] = &100*@AvgSub([15])/[TUC15]
@UPOC[19] = &100*@AvgSub([19])/[TUC19]
@UPOC[21] = &100*@AvgSub([21])/[TUC21]
T1 = [C23]*10/9
@UPOC[24] = &100*@AvgSub([24])/[TUC24]
@UPOC[26] = &100*@AvgSub([26])/[TUC26]

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 400 kg/ha, an increase in the chlorophyll content in the leaves was observed by 1,57% and Belenus used in dose 800 kg/ha an increase in the chlorophyll content in the leaves was observed by 2,97%.

Belenus used in dose 400 kg/ha resulted in an increase in yield by 1,72% and Belenus used in dose 800 kg/ha resulted in an increase in yield by 4,39%.

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 zawartości chlorofilu w liściach o 1,57%, natomiast po zastosowaniu nawozu Belenus w dawce 800 kg/ha zaobserwowano wzrost zawartości chlorofilu w liściach o 2,97%.

Belenus zastosowany w dawce 400 kg/ha spowodował wzrost plonów o 1,72% natomiast Belenus zastosowany w dawce 800 kg/ha spowodował wzrost plonów o 4,39%.

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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DATE: 02.12.2024

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