

A field trial investigating the resistance and tolerance characteristics of eleven potato varieties to Globodera pallida in Scotland.

Philip Burgess (Scottishpotatoes.org*) and **Eric Anderson (Scottish Agronomy)**

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Drone image of Barnyards trial site

^{*} Scottishpotatoes.org is a partnership between SRUC and James Hutton Institute.

















Introduction

Delivering a sustainable potato industry for Scotland through management of Potato cyst nematode (PCN) is a project managed by the Plant Health Centre with Scottish Government funding. In 2022 a field trial was established which aimed to provide information on the integrated control of *Globodera pallida* (Project Work package 7) and to provide a knowledge exchange platform branded as 'PCN Action Scotland' (Project Work package 8). An open day was conducted (16th August 2022) which was attended by over one hundred growers, agronomists, and potato breeders. At this event attendees also engaged with other work package leaders and outputs. The results of this trial were presented at a project conference (James Hutton Institute, 17th January 2023). This report brings together all the data and analysis from this trial.

Field trial

A field trial was planted at Barnyards Farm (Grid reference 488 575) on 02/05/2022 - a location with a moderate to high PCN population. The trial consisted of twelve potato varieties (11 varieties are reported here as information relating to the 12th variety was confidential to the breeder). Replicates of each variety were planted and treated with either Nemathorin 10G (30 kg/ha, a.i. Fosthiazate) or left untreated. All inputs into the trial were applied by the host grower and followed standard practice for ware crops in the region. The trial was flailed on 01/09/2022 and treated with Spotlight plus (1.0 l/ha) on 06/09/2022 before harvest on 24/09/2022.

Varieties

Details of the varieties including breeder, parentage, maturity, and the seed spacing used in this trial are given in Table 1. The variety characteristics, including resistance to both forms of PCN, which have been taken from multiple sources including the AHDB potatoes potato variety database and information held by breeders themselves is given in Table 2.

Cara, Innovator, Maris Peer, and Elland were included as examples of susceptibility to *G. pallida* as tolerant; resistant and intolerant, susceptible, and intolerant; resistant and tolerant varieties, respectively.

Table 1: Trial varieties, breeder, parentage, maturity, and seed tube spacing used.

Variety	Breeder	Parentage	Maturity	Seed spacing
Cara	IPM	Ulster Glade x A25/19	Late maincrop	30 cm
Maris Peer	PBI Cambridge	120/13 x Ulster Knight	Second early	31 cm
Elland	Cygnet	Golden Millenium x Innovator	Early maincrop	38 cm
Innovator	HZPC	Shepody x RZ-84-2580	Second early	41 cm
Eurostar	Stet	Victoria x Innovator	Main crop	50 cm
Buster	IPM	Innovator x ET5838/8	Late Maincrop	31 cm
Amanda	Solana	Epoka x SV66 123	Medium early	33 cm
Karelia	Europlant (Greenvale)	III 61659230 x Wentow 58 7 49	Medium early	35 cm
Cinderella	Cygnet	Crisps4all x 12601 AB1	Early	50 cm
Lanorma	Branston	Bydand x Caesar	Early maincrop	32 cm
Tyson	Stet	Sylvana x Cyrano	Maincrop	25 cm

Table 2: Pest and disease resistance of varieties (Data from range of sources)

Maniatus	Disease	/Pest resistance (s	cale 1 [highly susce	eptible]- 9 [fully res	sistant])
Variety	G. rostochiensis	G. pallida	Powdery scab	Blackleg	Common scab
Cara	R	2	3	6	7
Maris Peer	2	2	6	4	5
Elland	3	9	4	6	6
Innovator	2	8	7	5	6
Eurostar	9	9	4	4	5
Buster	9	9	4	6	7
Amanda	R	8	7	6	7
Karelia	8	8		High	High - Very High
Cinderella	R	6	7	-	(6)
Lanorma	9	5	4	4	7
Tyson	1	4	Slightly susceptible	-	6

- No data available

Assessments

Assessments were made before planting, during emergence and ground cover development, at harvest, and post-harvest.

<u>Initial PCN population (Pi) at planting:</u> Soil (500g) was sampled from each individual plot before planting. These were assessed by the SRUC crop clinic to determine the number of cysts and eggs present and expressed as number of viable cysts and eggs per gram of soil.

<u>Crop emergence</u>: The emergence of each plot was assessed on 30/05/22, 07/06/2022, and 15/06/2022 and expressed as the number of plants per 6m of drill.

<u>Potato foliage groundcover:</u> The ground cover in each plot was assessed visually on 07/06/2022, 15/06/2022, 22/06/2022, 30/06/2022, 08/07/2022, and 25/07/2022 and expressed as a percentage.

<u>Number of plants and stems:</u> After haulm destruction a count was taken of the number of plants and stems present in 3m drill lengths of each plot. The results were expressed as number of plants and stems per 3m length.

<u>Dry matter and specific gravity</u>: This was assessed by hygrometer for tuber samples from each plot and results were expressed as a percentage dry matter and relative density.

<u>Post harvest PCN population (Pf):</u> Soil (500g) was sampled from each individual plot after harvest. These samples were assessed by SRUC crop clinic to determine the number of cysts and eggs present and expressed as number of viable cysts and eggs per gram of soil.

<u>Tuber yield and number:</u> The central two drills of each plot were harvested. The harvested tubers were graded into different size fractions (<25mm, 25-30mm, 30-35mm, 35-40mm, 40-45mm, 45-50mm, 50-55mm, 55-60mm, 60-65mm, 65-70mm, 70-75mm, 75-80mm, 80-85mm, and >85mm) using a 'smartgrader' with the yield and tuber number in each size fraction determined. Results were expressed as tonnes/ha and tubers per ha. Total yield and tuber number was determined.

<u>Internal defects (Rots, Spraing, Hollow heart and Internal rust spot):</u> fifty tuber samples were sliced to record the frequency of internal defects by Scottish Agronomy. Results are expressed as percentage of tubers with internal disease present.

<u>Tuber skin finish and surface disease:</u> Samples of fifty tubers were retained in an ambient store and assessed in early December 2022. The tubers were washed and assessed for the presence of common scab (*Streptomyces scabies* spp.), powdery scab (*Spongospora subterranea*), black scurf (*Rhizoctonia solani*), Silver scurf (*Helminthosporium solani*) and black dot (*Colletotrichum coccodes*). Results are expressed as the percentage of tubers with infection (% incidence) and the average severity scores (scale of 0-3).

PCN Action Scotland open day, Barnyards - 16th August 2022



Results

Crop emergence and ground cover

Table 3: Crop emergence and ground cover at a range of dates during early and mid-growing season

		<u>ariety</u>																
			Emergen									ound (
Treatment	30/05/2		07/06/20		15/06/2	_	07/06/2	022	15/06/2	022	22/06/2	022	30/06/2	2022	08/07/2	022	25/07/2	2022
	N°/6r		N°/6m		N°/6r		%		%		%		%		%		%	
Cara	5.1	cd	17.6	b	17.5	bc	10.0	b	20.6	a	33.8	a	68.1	a	93.8	а	100.0	а
Maris Peer	7.8	ab	17.6	b	17.9	b	6.9	С	13.3	bc	21.3	cde	36.3	d	66.9	d	98.8	a
Elland Innovator	1.1 5.3	fg cd	12.1 12.6	d	13.9 13.0	g h	3.0 6.9	de c	7.1	ef bc	12.3 20.9	fg de	23.1 45.6	е	41.3 68.8	e cd	81.9 85.0	bc b
Eurostar	0.4		10.6	e	11.0	''	4.0	d	8.3	de	14.9	f	33.8	d	67.5	cd	100.0	а
Buster	0.4	g	10.0	e	17.0	d	1.5	e	5.0	f	9.8	g	21.9	e	39.4	e	76.9	C
Amanda	9.3	a	17.0	b	17.1	cd	8.1	bc	14.9	b	24.4	bc	50.6	bc	83.1	b	99.4	а
Karelia	3.5	de	15.0	c	15.0	f	6.3	C	11.0	cd	19.4	е	36.9	d	66.3	d	94.4	а
Cinderella	6.5	bc	9.5	e	9.5	i	13.1	a	15.5	b	25.6	b	48.8	С	75.0	С	97.5	а
Lanorma	0.1	g	14.4	С	15.0	f	4.0	d	14.6	b	26.3	b	62.5	а	91.3	а	100.0	а
Tyson	2.0	efg	20.9	а	21.0	а	7.5	С	14.1	b	23.1	bcd	55.6	b	88.1	ab	100.0	а
LSD P=.05		2.11		1.25		0.48		1.91		3.03		3.50		5.63		7.90		6.47
Standard Deviation		2.11		1.26		0.48		1.91		3.04		3.51		5.65		7.92		6.48
CV		57.30		8.79		3.16		30.52		25.06		17.16		12.99		11.19		6.88
F	and Carran but T													-				
Emergence and Grou	na Cover by I	reatme	<u>nt</u>															
			Emergen									ound (
Treatment	30/05/2		07/06/20		15/06/2		07/06/2	022	15/06/2	022	22/06/2	022	30/06/2	2022	08/07/2	022	25/07/2	022
	N°/6r		N°/6m		N°/6r	n	%		%		%		%		%		%	
Untreated	2.9	b	13.9	b	15.4	а	5.3	b	11.6	а	18.3	b	39.9	b	63.2	b	90.5	b
30kg/ha Nemathorin	4.5	а	14.7	а	15.2	а	7.2	а	12.6	а	22.6	а	47.1	а	78.2	а	98.0	а
LSD P=.05		0.86		0.51		0.20		0.78		1.24		1.43		2.30		3.22		2.64
Standard Deviation		2.11		1.26		0.48		1.91		3.04		3.51		5.65		7.92		6.48
CV		57.30		8.79		3.16		30.52		25.06		17.16		12.99		11.19		6.88
Emergence and Grou	nd Cover by V	ariety a	and Treatm	ent														
			Emergen	••							· ·	ound (Caucar					
Treatment	30/05/2	022	07/06/20		15/06/2	022	07/06/2	022	15/06/2	022	22/06/2		30/06/2	022	08/07/2	022	25/07/2	022
	N°/6r	n	N°/6m	1	N°/6r	n	%		%		%		%		%	ĺ	%	
Cara Untreated	2.3	f-i	17.8	b	17.5	cde	8.8	cde	20.0	ab	31.3	b	65.0	ab	88.8	ab	100.0	а
Cara Treated	8.0	abc	17.5	b	17.5	cde	11.3	abc	21.3	а	36.3	а	71.3	а	98.8	а	100.0	а
Maris Peer Untreated	7.8	abc	17.3	bc	17.8	cd	6.3	efg	13.5	cd	18.8	efg	32.5	ijk	57.5	fgh	97.5	ab
Maris Peer Treated	7.8	abc	18.0	b	18.0	С	7.5	def	13.0	cde	23.8	d	40.0	f-i	76.3	cd	100.0	а
Elland Untreated	0.5	hi	11.5	fg	14.0	h	2.5	hi	6.3	gh	11.0	jk	20.0	1	33.8	j	72.5	С
Elland Treated	1.8	ghi	12.8	ef	13.8	h	3.5	hi	8.0	fgh	13.5	hij	26.3	kl	48.8	hi	91.3	ab
Innovator Untreated	4.5	d-g	13.0	ef	13.0	i	5.0	fgh	14.0	cd	16.8	fgh	41.3	fgh	61.3	fg	73.8	C
Innovator Treated	6.0	b-e	12.3	fg	13.0	i	8.8	cde	13.5	cd	25.0	cd	50.0	cde	76.3	cd	96.3	ab
	0.0	i hi	10.5 10.8	gh	11.0 11.0	j	3.5 4.5	hi	8.5 8.0	fgh	13.5 16.3	hij	31.3 36.3	jk	62.5 72.5	efg de	100.0	a
Eurostar Untreated	0.6		8.0	gh	17.0	J e	1.5	gh i	4.5	fgh h	8.5	ghi k	21.3	g-j I	35.0		65.0	C
Eurostar Treated	0.0		0.0	1 1			1.5	i	5.5	gh	11.0	jk	22.5	H	43.8	j ij	88.8	b
Eurostar Treated Buster Untreated	0.0	j bi	12.0	fo	17.0	_				uil	11.0	J٨		1 1			98.8	а
Eurostar Treated Buster Untreated Buster Treated	0.5	hi	12.0 17.0	fg	17.0 17.3	e de					23.8	d	45 O	def	77.5		00.0	
Eurostar Treated Buster Untreated Buster Treated Amanda Untreated	0.5 10.0	hi a	17.0	bc	17.3	de	7.5	def	14.8	cd	23.8 25.0	d	45.0 56.3	def	77.5 88.8	cd ab	100.0	
Eurostar Treated Buster Untreated Buster Treated Amanda Untreated Amanda Treated	0.5 10.0 8.5	hi a ab	17.0 17.0	bc bc	17.3 17.0	de e	7.5 8.8	def cde	14.8 15.0	cd cd	25.0	cd	56.3	С	88.8	ab	100.0 88.8	а
Eurostar Treated Buster Untreated Buster Treated Amanda Untreated Amanda Treated Karelia Untreated	0.5 10.0	hi a	17.0	bc	17.3	de e g	7.5	def	14.8	cd		-					100.0 88.8 100.0	
Eurostar Treated Buster Untreated Buster Treated Amanda Untreated Amanda Treated Karelia Untreated Karelia Treated	0.5 10.0 8.5 1.5	hi a ab hi	17.0 17.0 15.0	bc bc d	17.3 17.0 15.0	de e	7.5 8.8 5.0	def cde fgh	14.8 15.0 11.0	cd cd def	25.0 17.5	cd fgh	56.3 31.3	c jk	88.8 56.3	ab fgh	88.8	a b
Eurostar Treated Buster Untreated Buster Treated Amanda Untreated Amanda Treated Karelia Untreated Karelia Untreated Cinderella Untreated	0.5 10.0 8.5 1.5 5.5	hi a ab hi cde	17.0 17.0 15.0 15.0	bc bc d	17.3 17.0 15.0 15.0	de e g g	7.5 8.8 5.0 7.5	def cde fgh def	14.8 15.0 11.0 11.0	cd cd def def	25.0 17.5 21.3	cd fgh def	56.3 31.3 42.5	c jk efg	88.8 56.3 76.3	ab fgh cd	88.8 100.0	a b a
Eurostar Treated Buster Untreated Buster Treated Amanda Untreated Amanda Treated Karelia Untreated Karelia Untreated Cinderella Untreated Cinderella Treated Lanorma Untreated	0.5 10.0 8.5 1.5 5.5 6.0 7.0 0.3	hi a ab hi cde b-e bcd i	17.0 17.0 15.0 15.0 9.5 9.5 14.3	bc bc d d hi hi de	17.3 17.0 15.0 15.0 9.5 9.5	de e g g k	7.5 8.8 5.0 7.5 12.5 13.8 3.5	def cde fgh def ab a hi	14.8 15.0 11.0 11.0 14.8 16.3	cd cd def def cd bc cde	25.0 17.5 21.3 22.5 28.8 23.8	cd fgh def de bc d	56.3 31.3 42.5 45.0 52.5 57.5	c jk efg def cd bc	88.8 56.3 76.3 63.8 86.3 85.0	ab fgh cd ef bc bc	88.8 100.0 95.0 100.0 100.0	a b a ab a
Eurostar Treated Buster Untreated Buster Treated Amanda Untreated Amanda Treated Karelia Untreated Karelia Treated Cinderella Untreated Cinderella Treated Lanorma Untreated Lanorma Untreated Lanorma Treated	0.5 10.0 8.5 1.5 5.5 6.0 7.0 0.3 0.0	hi a ab hi cde b-e bcd i	17.0 17.0 15.0 15.0 9.5 9.5 14.3 14.5	bc bc d d hi hi de de	17.3 17.0 15.0 15.0 9.5 9.5 15.0 15.0	de e g g k k k g g g	7.5 8.8 5.0 7.5 12.5 13.8 3.5 4.5	def cde fgh def ab a hi gh	14.8 15.0 11.0 11.0 14.8 16.3 13.0 16.3	cd cd def def cd bc cde	25.0 17.5 21.3 22.5 28.8 23.8 28.8	cd fgh def de bc d bc	56.3 31.3 42.5 45.0 52.5 57.5 67.5	c jk efg def cd bc	88.8 56.3 76.3 63.8 86.3 85.0 97.5	ab fgh cd ef bc bc	88.8 100.0 95.0 100.0 100.0 100.0	a b a ab a a
Eurostar Treated Buster Untreated Buster Treated Amanda Untreated Amanda Treated Karelia Untreated Karelia Untreated Cinderella Untreated Cinderella Untreated Lanorma Untreated Lanorma Treated Tyson Untreated	0.5 10.0 8.5 1.5 5.5 6.0 7.0 0.3 0.0	hi a ab hi cde b-e bcd i i hi	17.0 17.0 15.0 15.0 9.5 9.5 14.3 14.5 20.5	bc bc d d hi hi de de a	17.3 17.0 15.0 15.0 9.5 9.5 15.0 15.0 22.3	de e g g k k k g g g a	7.5 8.8 5.0 7.5 12.5 13.8 3.5 4.5 5.0	def cde fgh def ab a hi gh	14.8 15.0 11.0 11.0 14.8 16.3 13.0 16.3 13.5	cd cd def def cd bc cde bc	25.0 17.5 21.3 22.5 28.8 23.8 28.8 21.3	cd fgh def de bc d bc def	56.3 31.3 42.5 45.0 52.5 57.5 67.5 55.0	c jk efg def cd bc a	88.8 56.3 76.3 63.8 86.3 85.0 97.5 85.0	ab fgh cd ef bc bc a bc	88.8 100.0 95.0 100.0 100.0 100.0	a b a ab a a a
	0.5 10.0 8.5 1.5 5.5 6.0 7.0 0.3 0.0	hi a ab hi cde b-e bcd i	17.0 17.0 15.0 15.0 9.5 9.5 14.3 14.5	bc bc d d hi hi de de	17.3 17.0 15.0 15.0 9.5 9.5 15.0 15.0	de e g g k k k g g g	7.5 8.8 5.0 7.5 12.5 13.8 3.5 4.5	def cde fgh def ab a hi gh	14.8 15.0 11.0 11.0 14.8 16.3 13.0 16.3	cd cd def def cd bc cde	25.0 17.5 21.3 22.5 28.8 23.8 28.8	cd fgh def de bc d bc	56.3 31.3 42.5 45.0 52.5 57.5 67.5	c jk efg def cd bc	88.8 56.3 76.3 63.8 86.3 85.0 97.5	ab fgh cd ef bc bc	88.8 100.0 95.0 100.0 100.0 100.0	a b a ab a a
Eurostar Treated Buster Untreated Buster Treated Amanda Untreated Amanda Treated Karelia Untreated Karelia Untreated Cinderella Untreated Cinderella Untreated Lanorma Untreated Lanorma Treated Tyson Untreated	0.5 10.0 8.5 1.5 5.5 6.0 7.0 0.3 0.0	hi a ab hi cde b-e bcd i i hi	17.0 17.0 15.0 15.0 9.5 9.5 14.3 14.5 20.5	bc bc d d hi hi de de a	17.3 17.0 15.0 15.0 9.5 9.5 15.0 15.0 22.3	de e g g k k k g g g a	7.5 8.8 5.0 7.5 12.5 13.8 3.5 4.5 5.0	def cde fgh def ab a hi gh	14.8 15.0 11.0 11.0 14.8 16.3 13.0 16.3 13.5	cd cd def def cd bc cde bc	25.0 17.5 21.3 22.5 28.8 23.8 28.8 21.3	cd fgh def de bc d bc def	56.3 31.3 42.5 45.0 52.5 57.5 67.5 55.0	c jk efg def cd bc a	88.8 56.3 76.3 63.8 86.3 85.0 97.5 85.0 91.3	ab fgh cd ef bc bc a bc	88.8 100.0 95.0 100.0 100.0 100.0	a b a ab a a a
Eurostar Treated Buster Untreated Buster Treated Amanda Untreated Amanda Treated Karelia Untreated Karelia Untreated Cinderella Untreated Cinderella Treated Cinderella Treated Lanorma Untreated Lanorma Treated Tyson Untreated Tyson Treated	0.5 10.0 8.5 1.5 5.5 6.0 7.0 0.3 0.0	hi a ab hi cde b-e bcd i hi e-h	17.0 17.0 15.0 15.0 9.5 9.5 14.3 14.5 20.5	bc bc d d hi hi de de a a	17.3 17.0 15.0 15.0 9.5 9.5 15.0 15.0 22.3	de e g g k k k g g a b	7.5 8.8 5.0 7.5 12.5 13.8 3.5 4.5 5.0	def cde fgh def ab a hi gh fgh bcd	14.8 15.0 11.0 11.0 14.8 16.3 13.0 16.3 13.5	cd cd def def cd bc cde bc	25.0 17.5 21.3 22.5 28.8 23.8 28.8 21.3	cd fgh def de bc d bc def cd	56.3 31.3 42.5 45.0 52.5 57.5 67.5 55.0	c jk efg def cd bc a c	88.8 56.3 76.3 63.8 86.3 85.0 97.5 85.0 91.3	ab fgh cd ef bc bc a bc ab	88.8 100.0 95.0 100.0 100.0 100.0	a b a ab a a a a

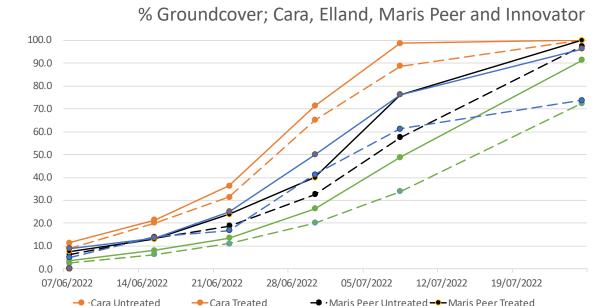


Figure 1 - Sequential assessment of percentage ground cover for four contrasting varieties

Innovator Untreated
 Innovator Treated

--- Elland Treated

Significant differences in the emergence of different varieties were observed, as might be expected. Overall, Nemathorin treatment resulted in a significantly increased overall emergence when compared to untreated reps. Although the effect was small, there were no significant differences observed between the emergence of individual varieties in response to Nemathorin treatment (Table 3). The early growth of potatoes is mostly reliant upon reserves present within the mother tuber and at this early growth stage is generally unaffected by the presence of PCN.

Later observations of ground cover development were found to vary between varieties and in response to the application of Nemathorin (Figure 1). In each case (where a significant effect was observed) the application of Nemathorin improved development of ground cover. The only variety where there was not a significant positive effect of Nemathorin application at any of the assessments was Eurostar.

Number of plants, stems, rots, Dry matter, and specific gravity

• Elland Untreated

The number of plants in each plot was a factor of the initial planting rate with the number of stems in each 3 m of drill length being dependent upon the planting density and the characteristics of the variety (Table 4). Significant differences were noted between varieties and in developing variety-specific agronomy recommendations these differences should be considered. There was no significant effect of Nemathorin application on the number of plants or in stem numbers.

Table 4: Number of plants and stems at the end of the season, dry matter, and specific gravity.

	Plant		Stem		Rots		Rots		DM		Densi	_
Treatment	24/09/20)22	24/09/20	022	24/09/2	022	14/10/2	022	28/10/20	022	28/10/2	022
	/3m		/3m		/3m	1	/3m		%		1.065-1.	110
Cara	9.8	b	53.8	а	0.0	С	0.0	b	17.1	е	1.066	е
Maris Peer	9.6	bc	37.1	С	0.0	С	0.0	b	19.0	С	1.076	bc
Elland	7.5	ef	22.6	fg	2.4	а	0.4	b	17.0	е	1.066	е
Innovator	7.3	f	33.9	cd	0.0	С	0.0	b	18.0	d	1.071	d
Eurostar	5.9	g	19.4	g	0.8	bc	1.3	ab	17.0	е	1.066	е
Buster	9.0	cd	23.8	fg	0.0	С	0.3	b	17.0	е	1.065	е
Amanda	9.0	cd	46.4	b	0.0	С	0.0	b	19.3	b	1.077	b
Karelia	8.1	е	31.3	de	0.0	С	0.0	b	17.0	е	1.065	е
Cinderella	6.5	g	54.0	а	1.6	ab	2.3	а	21.6	а	1.088	а
Lanorma	8.1	e	44.3	b	0.6	bc	0.4	b	17.0	е	1.065	е
Tyson	10.9	a	26.1	ef	1.3	abc	0.1	b	18.0	d	1.071	d
.,,						1.00						-
LSD P=.05		0.68		5.62		1.26		1.53		0.33	(0.002
Standard Deviation		0.68		5.63		1.27		1.54		0.33		0.002
CV		8.10		16.14		221.02	3	398.85		1.84		0.169
Number of plants, stem	no moto almir	mattar (0/\ amalala	maitu b		- m4						
Number of plants, stem	is, rots, ary	matter (<u>7₀) and de</u>	ensity D	y treatme	ent_						
	Plants	s	Stem	s	Rots	s	Rots	3	DM		Densi	ty
Treatment	24/09/20)22	24/09/20	022	24/09/2	2022	14/10/20	022	28/10/20	022	28/10/2	022
	/3m		/3m		/3m	1	/3m		%		1.065-1.	110
Untreated	8.5	а	35.4	а	0.5	а	0.3	а	18.2	а	1.071	а
30kg/ha Nemathorin	8.3	а	34.4	а	0.6	а	0.5	а	18.0	b	1.070	b
LSD P=.05		0.28		2.29		0.52		0.63		0.14	(0.001
Standard Deviation		0.68		5.63		1.27		1.54		0.33	(0.002
CV		8.10		16.14		221.02	3	98.85		1.84		0.169
Number of plants, stem	ns, rots, dry	matter (%) and de	ensity b	y vareity	and tre	atment_					
Number of plants, stem Treatment	Plant:	s	%) and de Stem 24/09/20	s	y vareity Rots 24/09/2	s	Rots		DM 28/10/20	022	Densi 28/10/2	
	Plant	s	Stem	s 022	Rots	s 2022	Rots	022		022		022
	Plant: 24/09/20	s	Stem 24/09/20	s 022	Rot: 24/09/2	s 2022	Rots	022	28/10/20		28/10/2	022
Treatment	Plant: 24/09/20 /3m	s)22	Stem 24/09/20 /3m	s 022	Rots 24/09/2 /3m	s 2022	Rots 14/10/20 /3m	022	28/10/20 % 17.3	g	28/10/20 1.065-1.	022 110
Treatment Cara Untreated	Plant: 24/09/20 /3m 9.8	s 022 b	Stem 24/09/20 /3m 57.8	s 022 a bc	Rot: 24/09/2 /3m 0.0	s 2022 1 d	Rots 14/10/20 /3m 0.0	022	28/10/20 %		28/10/2 1.065-1. 1.066	022 110 h
Treatment Cara Untreated Cara Treated	Plant: 24/09/20 /3m 9.8 9.8	b b	Stem 24/09/20 /3m 57.8 49.8	s 0 22	Rots 24/09/2 /3m 0.0 0.0	8022 1 d d	Rots 14/10/20 /3m 0.0 0.0	b b	28/10/20 % 17.3 17.0	g g	28/10/2 1.065-1. 1.066 1.066	022 110 h h
Treatment Cara Untreated Cara Treated Maris Peer Untreated	Plant: 24/09/20 /3m 9.8 9.8 9.5	b b bc b	Stem 24/09/20 /3m 57.8 49.8 36.8	a bc efg	Rots 24/09/2 /3m 0.0 0.0 0.0	8 2022 1 d d d d	Rots 14/10/20 /3m 0.0 0.0 0.0	b b b	28/10/20 % 17.3 17.0 19.2	g g cd de	28/10/2 6 1.065-1. 1.066 1.066 1.077	022 110 h h
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated	Plant: 24/09/20 /3m 9.8 9.8 9.5 9.8	b b bc b fgh	Stem 24/09/20 /3m 57.8 49.8 36.8 37.5 24.0	a bc efg def	Rot: 24/09/2 /3m 0.0 0.0 0.0 0.0	8 2022 1 d d d d d d	Rots 14/10/20 /3m 0.0 0.0 0.0 0.0	b b b	28/10/20 % 17.3 17.0 19.2 18.8	g g cd de	28/10/20 1.065-1. 1.066 1.066 1.077 1.075	022 110 h h cd
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated	Plant: 24/09/20 /3m 9.8 9.8 9.5 9.8 7.8	b b bc b	Stem 24/09/20 /3m 57.8 49.8 36.8 37.5	a bc efg def kl	Rot: 24/09/2 /3m 0.0 0.0 0.0 0.0 0.0 2.0	8 2022 1 d d d d d d abc	Rots 14/10/20 /3m 0.0 0.0 0.0 0.0 0.0	b b b b b	28/10/20 % 17.3 17.0 19.2 18.8 17.0	g g cd de	28/10/20 1.065-1. 1.066 1.066 1.077 1.075 1.066	022 110 h h cd def h
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated	Plant: 24/09/20 /3m 9.8 9.8 9.5 9.8 7.8 7.3	b b bc b fgh gh	Stem 24/09/20 /3m 57.8 49.8 36.8 37.5 24.0 21.3	a bc efg def kl	Rots: 24/09/2 /3m 0.0 0.0 0.0 0.0 2.0 2.8	8 2022 1 d d d d d d abc ab	Rots 14/10/20 /3m 0.0 0.0 0.0 0.0 0.0 0.3 0.5	b b b b b b	28/10/20 % 17.3 17.0 19.2 18.8 17.0 17.0	g g cd de g	28/10/2 1.065-1. 1.066 1.066 1.077 1.075 1.066 1.066	022 110 h h cd def
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated	Plant: 24/09/20 /3m 9.8 9.8 9.5 9.8 7.8 7.3 7.5	b b b bc b fgh gh fgh	Stem 24/09/20 /3m 57.8 49.8 36.8 37.5 24.0 21.3 34.0	a bc efg def kl l fgh	Rots: 24/09/2 /3m 0.0 0.0 0.0 0.0 2.0 2.8 0.0	8 2022 1 d d d d d d abc ab d	Rots 14/10/20 /3m 0.0 0.0 0.0 0.0 0.3 0.5 0.0	b b b b b b b	28/10/20 % 17.3 17.0 19.2 18.8 17.0 17.0 18.0	g g cd de g g	28/10/2 1.065-1. 1.066 1.077 1.075 1.066 1.066 1.071	022 110 h h cd def h h
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated Innovator Treated	Plant: 24/09/20 /3m 9.8 9.8 9.5 9.8 7.8 7.3 7.5 7.0	b b bc b fgh gh fgh h	Stem 24/09/20 /3m 57.8 49.8 36.8 37.5 24.0 21.3 34.0 33.8	a bc efg def kl l fgh f-i	Rots 24/09/2 /3m 0.0 0.0 0.0 0.0 2.0 2.8 0.0 0.0	s 9022 1 d d d d d d abc ab d d d	Rots 14/10/20 /3m 0.0 0.0 0.0 0.0 0.0 0.3 0.5 0.0 0.0	b b b b b b b b b	28/10/20 % 17.3 17.0 19.2 18.8 17.0 17.0 18.0 18.0	g g cd de g g f	28/10/2 1.065-1. 1.066 1.066 1.077 1.075 1.066 1.066 1.071	022 110 h h cd def h h
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated Innovator Treated Eurostar Untreated	Plant: 24/09/20 /3m 9.8 9.8 9.5 9.8 7.8 7.3 7.5 7.0 6.0	b b bc b fgh gh fgh h i	Stem 24/09/20 /3m 57.8 49.8 36.8 37.5 24.0 21.3 34.0 33.8 20.3	a bc efg def kl l fgh f-i l	Rots 24/09/2 /3m 0.0 0.0 0.0 0.0 2.0 2.8 0.0 0.0 1.0	s : :: : : : : : : : : : : : : : : : :	Rots 14/10/2 /3m 0.0 0.0 0.0 0.0 0.0 0.3 0.5 0.0 0.0 1.8	b b b b b b b b ab	28/10/20 % 17.3 17.0 19.2 18.8 17.0 17.0 18.0 18.0 17.1	g g cd de g g f f	28/10/20 1.065-1. 1.066 1.066 1.077 1.075 1.066 1.071 1.071 1.071	022 110 h h cd def h h g
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated	Plant: 24/09/20 /3m 9.8 9.8 9.5 9.8 7.8 7.3 7.5 7.0 6.0 5.8	b b bc b fgh gh fgh h i i	Stem 24/09/20 /3m 57.8 49.8 36.8 37.5 24.0 21.3 34.0 33.8 20.3 18.5	a bc efg def kl I fgh f-i I I	Rots 24/09/2 /3m 0.0 0.0 0.0 0.0 2.0 2.8 0.0 0.0 1.0 0.5	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	Rots 14/10/2 /3m 0.0 0.0 0.0 0.0 0.3 0.5 0.0 0.0 1.8	b b b b b b b b b b b b b b b b b b b	28/10/20 % 17.3 17.0 19.2 18.8 17.0 17.0 18.0 18.0 17.1 17.0	g g cd de g g f f g g g	28/10/20 1.065-1. 1.066 1.066 1.077 1.075 1.066 1.071 1.071 1.071 1.066	022 110 h h cd def h h g g h
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Untreated Eurostar Untreated Buster Untreated	Plant: 24/09/20 /3m 9.8 9.8 9.5 9.8 7.8 7.3 7.5 7.0 6.0 5.8 9.0	b b bc b fgh gh fgh h i i bcd	Stem 24/09/20 /3m 57.8 49.8 36.8 37.5 24.0 21.3 34.0 33.8 20.3 18.5 23.5	a bc efg def kl l fgh f-i l kl	Rots 24/09/2 /3m 0.0 0.0 0.0 0.0 2.0 2.8 0.0 0.0 1.0 0.5 0.0	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	Rots 14/10/2 /3m 0.0 0.0 0.0 0.0 0.3 0.5 0.0 0.0 1.8 0.8	b b b b b b b b b b b b b b b b b b b	28/10/20 % 17.3 17.0 19.2 18.8 17.0 17.0 18.0 18.0 17.1 17.0 17.0	g g cd de g g f f g g g g	28/10/20 1.065-1. 1.066 1.066 1.077 1.075 1.066 1.071 1.071 1.066 1.066 1.066	022 110 h h cd def h h g g h
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated Buster Untreated Buster Treated	Plant: 24/09/20 /3m 9.8 9.8 9.5 9.8 7.8 7.3 7.5 7.0 6.0 5.8 9.0 9.0	b b bc b fgh gh fgh h i i bcd bcd	Stem 24/09/20 /3m 57.8 49.8 36.8 37.5 24.0 21.3 34.0 33.8 20.3 18.5 23.5 24.0	a bc efg def kl I fgh f-i I kl kl kl	Rots 24/09/2 /3m 0.0 0.0 0.0 0.0 2.0 2.8 0.0 0.0 1.0 0.5 0.0 0.0	s constant of the constant of	Rots 14/10/2 /3m 0.0 0.0 0.0 0.0 0.3 0.5 0.0 0.0 1.8 0.8 0.0 0.5	b b b b b b b b b b b b b b b b b b b	28/10/20 % 17.3 17.0 19.2 18.8 17.0 17.0 18.0 18.0 17.1 17.0 17.0 17.0	g g cd de g g f f g g g g g g	28/10/20 1.065-1. 1.066 1.066 1.077 1.075 1.066 1.071 1.071 1.066 1.066 1.065	022 110 h h cd def h h g g h h
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated Buster Untreated Buster Treated Amanda Untreated	Plant: 24/09/20 /3m 9.8 9.8 9.5 9.8 7.8 7.3 7.5 7.0 6.0 5.8 9.0 9.0 9.3	b b b bc b fgh gh fgh h i i bcd bcd bc	Stem 24/09/20 /3m 57.8 49.8 36.8 37.5 24.0 21.3 34.0 33.8 20.3 18.5 23.5 24.0 48.0	a bc efg def kl	Rots 24/09/2 /3m 0.0 0.0 0.0 0.0 2.0 2.8 0.0 0.0 1.0 0.5 0.0 0.0 0.0	8 2022 1 d d d d d abc ab d d bcd cd d d d d d d d d	Rots 14/10/2 /3m 0.0 0.0 0.0 0.0 0.3 0.5 0.0 0.0 1.8 0.8 0.0 0.5 0.0	b b b b b b b b b b b b b b b b b b b	28/10/20 % 17.3 17.0 19.2 18.8 17.0 17.0 18.0 18.0 17.1 17.0 17.0 17.0 19.5	g g cd de g g f f g g g g c cd	28/10/20 1.065-1. 1.066 1.066 1.077 1.075 1.066 1.071 1.071 1.066 1.066 1.065 1.065	022 110 h h cd def h h g g h h
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated Buster Untreated Buster Treated Amanda Untreated Amanda Treated	Plant: 24/09/20 /3m 9.8 9.8 9.5 9.8 7.8 7.3 7.5 7.0 6.0 5.8 9.0 9.0 9.3 8.8	b b b b b b b b b b b b b b b b b b b	Stem 24/09/20 /3m 57.8 49.8 36.8 37.5 24.0 21.3 34.0 33.8 20.3 18.5 23.5 24.0 48.0 44.8	a bc efg def kl l fgh f-i l kl kl bc cd	Rots 24/09/2 /3m 0.0 0.0 0.0 0.0 2.0 2.8 0.0 0.0 1.0 0.5 0.0 0.0 0.0 0.0 0.0	s 2022 1 d d d d d d d d d d d d d d d d d d	Rots 14/10/2 /3m 0.0 0.0 0.0 0.0 0.3 0.5 0.0 0.0 1.8 0.8 0.0 0.5 0.0 0.0	b b b b b b b b b b b b b b b b b b b	28/10/20 % 17.3 17.0 19.2 18.8 17.0 17.0 18.0 18.0 17.1 17.0 17.0 17.0 19.5 19.2	g g cd de g g f f g g g g c	28/10/20 1.065-1. 1.066 1.066 1.077 1.075 1.066 1.066 1.071 1.071 1.066 1.065 1.065 1.078 1.076	022 110 h h cd def h h g g h h h c
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated Buster Untreated Buster Untreated Amanda Untreated Amanda Untreated Karelia Untreated	Plant: 24/09/20 /3m 9.8 9.8 9.5 9.8 7.8 7.5 7.0 6.0 5.8 9.0 9.0 9.3 8.8 8.0	b b b bc b fgh gh fgh h i i bcd bcd bc cde efg	Stem 24/09/20 /3m 57.8 49.8 36.8 37.5 24.0 21.3 34.0 33.8 20.3 18.5 23.5 24.0 48.0 44.8 29.3	s	Rots 24/09/2 /3m 0.0 0.0 0.0 0.0 2.0 2.8 0.0 0.0 1.0 0.5 0.0 0.0 0.0 0.0 0.0 0.0	s 2022 1 d d d d d d d d d d d d d d d d d d	Rots 14/10/2 /3m 0.0 0.0 0.0 0.0 0.3 0.5 0.0 0.0 1.8 0.8 0.0 0.5 0.0 0.0 0.0 0.0	b b b b b b b b b b b b b b b b b b b	28/10/20 % 17.3 17.0 19.2 18.8 17.0 17.0 18.0 18.0 17.1 17.0 17.0 17.0 17.0 17.0 17.0 17	g g cd de g g f f g g g c cd cd g	28/10/20 1.065-1. 1.066 1.066 1.077 1.075 1.066 1.066 1.071 1.071 1.066 1.065 1.065 1.065 1.078 1.076	022 110 h h cd def h h g g h h h c
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated Buster Untreated Buster Untreated Amanda Untreated Amanda Untreated Karelia Untreated Karelia Untreated	Plant: 24/09/20 /3m 9.8 9.8 9.5 9.8 7.8 7.5 7.0 6.0 5.8 9.0 9.0 9.3 8.8 8.0 8.3	b b b b b b b b b b b b b b b b b b b	Stem 24/09/20 /3m 57.8 49.8 36.8 37.5 24.0 21.3 34.0 33.8 20.3 18.5 23.5 24.0 48.0 44.8 29.3 33.3	s D22	Rote 24/09/2 /3m 0.0 0.0 0.0 0.0 2.0 2.8 0.0 0.0 1.0 0.5 0.0 0.0 0.0 0.0 0.0 0.0 0.0	s 2022 d d d d d d d d d d d d d d d d d	Rots 14/10/2 /3m 0.0 0.0 0.0 0.0 0.3 0.5 0.0 0.0 1.8 0.8 0.0 0.5 0.0 0.0 0.0 0.0 0.0	D	28/10/20 % 17.3 17.0 19.2 18.8 17.0 17.0 18.0 18.0 17.1 17.0 17.0 17.0 17.0 17.0 17.0 17	g g cd de g g f f g g g c cd g g g c cd g g g g c cd g g g g	28/10/20 1.065-1. 1.066 1.066 1.077 1.075 1.066 1.066 1.071 1.071 1.066 1.065 1.065 1.065 1.078 1.076 1.065	022 110 h h cd def h h g g h h h c
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated Buster Untreated Buster Untreated Amanda Untreated Amanda Untreated Karelia Untreated Karelia Untreated Cinderella Untreated	Plant: 24/09/20 /3m 9.8 9.8 9.5 9.8 7.8 7.5 7.0 6.0 5.8 9.0 9.0 9.3 8.8 8.0 8.3 7.0	b b b bc b fgh gh fgh h i i bcd bcd bc cde efg def h	Stem 24/09/20 /3m 57.8 49.8 36.8 37.5 24.0 21.3 34.0 33.8 20.3 18.5 23.5 24.0 48.0 44.8 29.3 33.3 54.0	s D22	Rots 24/09/2 /3m 0.0 0.0 0.0 0.0 2.0 2.8 0.0 0.0 1.0 0.5 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	s 2022 1 d d d d d d d d d d d d d d d d d d	Rots 14/10/2 /3m 0.0 0.0 0.0 0.0 0.3 0.5 0.0 0.0 1.8 0.8 0.0 0.5 0.0 0.0 0.0 1.3	b b b b b b b b b b b b b b b b b b b	28/10/20 % 17.3 17.0 19.2 18.8 17.0 17.0 18.0 18.0 17.1 17.0 17.0 17.0 17.0 17.0 19.5 19.2 17.0 17.0 22.0	g g cd de g g f f g g g c cd g g g c cd g g g a	28/10/20 1.065-1. 1.066 1.066 1.077 1.075 1.066 1.066 1.071 1.071 1.066 1.065 1.065 1.078 1.076 1.065 1.065 1.065 1.065	022 110 h h cd def h h g h h c h h a
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated Buster Untreated Buster Untreated Amanda Untreated Amanda Treated Karelia Untreated Karelia Untreated Cinderella Untreated Cinderella Untreated	Plant: 24/09/20 /3m 9.8 9.8 9.5 9.8 7.3 7.5 7.0 6.0 5.8 9.0 9.0 9.3 8.8 8.0 8.3 7.0 6.0	b b b b b b fgh gh fgh h i i bcd bc cde efg def h i def	Stem 24/09/20 /3m 57.8 49.8 36.8 37.5 24.0 21.3 34.0 33.8 20.3 18.5 23.5 24.0 48.0 44.8 29.3 33.3 54.0 54.0	a bc efg def kl l fgh f-i l kl kl bc cd g-k f-j ab ab	Rote 24/09/2 /3m 0.0 0.0 0.0 0.0 2.0 2.8 0.0 0.0 1.0 0.5 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	s 2022 1 d d d d d d d d d d d d d d d d d d	Rots 14/10/2 /3m 0.0 0.0 0.0 0.0 0.3 0.5 0.0 0.0 1.8 0.8 0.0 0.5 0.0 0.0 0.0 1.3 3.3	b b b b b b b b b b b b b b b ab ab a a	28/10/20 % 17.3 17.0 19.2 18.8 17.0 17.0 18.0 18.0 17.1 17.0 17.0 17.0 17.0 17.0 19.5 19.2 17.0 17.0 22.0 21.3	g g cd de g g f f g g c cd g g g c cd g g g a b g	28/10/20 1.065-1. 1.066 1.066 1.077 1.075 1.066 1.066 1.071 1.071 1.066 1.065 1.065 1.078 1.076 1.065 1.065 1.065 1.065 1.065 1.065 1.065	022 110 h h cd def h h g h h c h h a b
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Untreated Buster Untreated Buster Untreated Amanda Untreated Amanda Treated Karelia Untreated Karelia Untreated Cinderella Untreated Cinderella Untreated Lanorma Untreated	Plant: 24/09/20 /3m 9.8 9.8 9.5 9.8 7.3 7.5 7.0 6.0 5.8 9.0 9.0 9.3 8.8 8.0 8.3 7.0 6.0 8.3 8.0	b b b b b b b b b b b b b b b b b b b	Stem 24/09/20 /3m 57.8 49.8 36.8 37.5 24.0 21.3 34.0 33.8 20.3 18.5 23.5 24.0 48.0 44.8 29.3 33.3 54.0 54.0 45.5 43.0	a bc efg def kl l fgh f-i l kl kl bc cd g-k f-j ab ab c cde	Rots 24/09/2 /3m 0.0 0.0 0.0 0.0 2.0 2.8 0.0 0.0 1.0 0.5 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	8 8 1022 1	Rots 14/10/20 /3m 0.0 0.0 0.0 0.0 0.3 0.5 0.0 0.0 1.8 0.8 0.0 0.5 0.0 0.0 0.0 1.3 3.3 0.5 0.3	b b b b b b b b b b b b b b b b b b b	28/10/20 % 17.3 17.0 19.2 18.8 17.0 17.0 18.0 18.0 17.1 17.0 17.0 17.0 17.0 19.5 19.2 17.0 17.0 22.0 21.3 17.0 17.0	g g cd de g g f f g g g c cd g g g c cd b	28/10/20 1.065-1. 1.066 1.077 1.075 1.066 1.071 1.071 1.066 1.071 1.066 1.065 1.065 1.078 1.076 1.065 1.065 1.065 1.065 1.065 1.065	022 110 h h cd defi h h g g h h h c cde h h h a c cde h h h h c cd h h h c c c c c c c c c c
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Untreated Buster Untreated Buster Untreated Buster Untreated Karelia Untreated Karelia Untreated Karelia Untreated Cinderella Untreated Cinderella Untreated Lanorma Untreated Lanorma Untreated Lanorma Treated Tyson Untreated	Plant: 24/09/20 /3m 9.8 9.8 9.5 9.8 7.3 7.5 7.0 6.0 5.8 9.0 9.0 9.3 8.8 8.0 8.3 7.0 6.0 8.3 8.0 10.8	b b b b b b fgh gh fgh h i i bcd bc cde efg def h i def efg a	Stem 24/09/20 /3m 57.8 49.8 36.8 37.5 24.0 21.3 34.0 33.8 20.3 18.5 24.0 44.8 29.3 33.3 54.0 54.0 45.5 43.0 26.0	a bc efg def kl l fgh f-i l kl bc cd g-k f-j ab ab c cde i-l	Rots 24/09/2 /3m 0.0 0.0 0.0 0.0 2.0 2.8 0.0 0.0 1.0 0.5 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.3 1.3 0.0 1.8	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	Rots 14/10/20 /3m 0.0 0.0 0.0 0.0 0.3 0.5 0.0 0.0 1.8 0.8 0.0 0.5 0.0 0.0 0.0 1.3 3.3 0.5 0.3	b b b b b b b b b b b b b b b b b b b	28/10/20 17.3 17.0 19.2 18.8 17.0 18.0 17.1 17.0 17.0 17.0 17.0 19.5 19.2 17.0 22.0 21.3 17.0 18.1	g g cd de g g f f g g c cd g g c cd g g g c cd g g g a b g g	28/10/20 1.065-1. 1.066 1.077 1.075 1.066 1.071 1.071 1.066 1.065 1.065 1.078 1.076 1.065 1.065 1.065 1.065 1.076 1.065 1.076 1.065 1.070	022 110 h h cd deff h h g g h h h c cdef h h h g g h h h h f c cdef h h h f g h h h h c c c c c c c c c c c c c c c
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Untreated Buster Untreated Buster Untreated Buster Untreated Karelia Untreated Karelia Untreated Karelia Untreated Cinderella Untreated Cinderella Untreated Lanorma Untreated Lanorma Untreated Lanorma Treated Tyson Untreated	Plant: 24/09/20 /3m 9.8 9.8 9.5 9.8 7.3 7.5 7.0 6.0 5.8 9.0 9.0 9.3 8.8 8.0 8.3 7.0 6.0 8.3 8.0	b b b b b b b b b b b b b b b b b b b	Stem 24/09/20 /3m 57.8 49.8 36.8 37.5 24.0 21.3 34.0 33.8 20.3 18.5 23.5 24.0 48.0 44.8 29.3 33.3 54.0 54.0 45.5 43.0	a bc efg def kl l fgh f-i l kl kl bc cd g-k f-j ab ab c cde	Rots 24/09/2 /3m 0.0 0.0 0.0 0.0 2.0 2.8 0.0 0.0 1.0 0.5 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	Rots 14/10/20 /3m 0.0 0.0 0.0 0.0 0.3 0.5 0.0 0.0 1.8 0.8 0.0 0.5 0.0 0.0 0.0 1.3 3.3 0.5 0.3	b b b b b b b b b b b b b b b b b b b	28/10/20 % 17.3 17.0 19.2 18.8 17.0 17.0 18.0 18.0 17.1 17.0 17.0 17.0 17.0 19.5 19.2 17.0 17.0 22.0 21.3 17.0 17.0	g g cd de g g f f g g g c cd g g g c cd g g g f f f g g g f c cd g g g a b g f f	28/10/20 1.065-1. 1.066 1.077 1.075 1.066 1.071 1.071 1.066 1.071 1.066 1.065 1.065 1.078 1.076 1.065 1.065 1.065 1.065 1.065 1.065	022 110 h h cd defe h h h c cdee h h
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated Eurostar Untreated Eurostar Treated Buster Untreated Buster Untreated Amanda Untreated Amanda Untreated Karelia Untreated Cinderella Untreated Cinderella Untreated Cinderella Treated Lanorma Untreated Lanorma Untreated Lanorma Untreated Tyson Untreated	Plant: 24/09/20 /3m 9.8 9.8 9.5 9.8 7.3 7.5 7.0 6.0 5.8 9.0 9.0 9.3 8.8 8.0 8.3 7.0 6.0 8.3 8.0 10.8	b b b b bc b fgh gh fgh h i bcd bcd bcd efg def h i def efg a a	Stem 24/09/20 /3m 57.8 49.8 36.8 37.5 24.0 21.3 34.0 33.8 20.3 18.5 24.0 44.8 29.3 33.3 54.0 54.0 45.5 43.0 26.0	a bc efg def kl l fgh f-i l kl kl bc cd g-k f-j ab ab c cde i-l h-l	Rots 24/09/2 /3m 0.0 0.0 0.0 0.0 2.0 2.8 0.0 0.0 1.0 0.5 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.3 1.3 0.0 1.8	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	Rots 14/10/20 /3m 0.0 0.0 0.0 0.0 0.3 0.5 0.0 0.0 1.8 0.8 0.0 0.5 0.0 0.0 0.0 1.3 3.3 0.5 0.3	b b b b b b b b b b b b b b b b b b b	28/10/20 17.3 17.0 19.2 18.8 17.0 18.0 17.1 17.0 17.0 17.0 17.0 19.5 19.2 17.0 22.0 21.3 17.0 18.1	g g g cd de g g f f g g g cc cd g g f f f g g g f f f f g f f f f g f f f f f f g f	28/10/20 1.065-1. 1.066 1.077 1.075 1.066 1.071 1.071 1.066 1.065 1.065 1.078 1.076 1.065 1.065 1.065 1.065 1.078 1.079 1.086 1.079 1.086 1.085 1.090 1.086 1.065 1.072	022 110 h h cd defi h h g g h h h cdete h h h g g h h h h cdete h h h g g h h h cdete h h h cdete h h h h cdete h h h h h h h h h h h h h h h h h h
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Untreated Buster Untreated Buster Untreated Buster Untreated Karelia Untreated Karelia Untreated Karelia Untreated Cinderella Untreated Cinderella Untreated Lanorma Untreated Lanorma Untreated Lanorma Treated Tyson Untreated	Plant: 24/09/20 /3m 9.8 9.8 9.5 9.8 7.3 7.5 7.0 6.0 5.8 9.0 9.0 9.3 8.8 8.0 8.3 7.0 6.0 8.3 8.0 10.8	b b b b b b fgh gh fgh h i i bcd bc cde efg def h i def efg a	Stem 24/09/20 /3m 57.8 49.8 36.8 37.5 24.0 21.3 34.0 33.8 20.3 18.5 24.0 44.8 29.3 33.3 54.0 54.0 45.5 43.0 26.0	a bc efg def kl l fgh f-i l kl bc cd g-k f-j ab ab c cde i-l	Rots 24/09/2 /3m 0.0 0.0 0.0 0.0 2.0 2.8 0.0 0.0 1.0 0.5 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.3 1.3 0.0 1.8	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	Rots 14/10/20 /3m 0.0 0.0 0.0 0.0 0.3 0.5 0.0 0.0 1.8 0.8 0.0 0.5 0.0 0.0 0.0 1.3 3.3 0.5 0.3	b b b b b b b b b b b b b b b b b b b	28/10/20 17.3 17.0 19.2 18.8 17.0 18.0 17.1 17.0 17.0 17.0 17.0 19.5 19.2 17.0 22.0 21.3 17.0 18.1	g g cd de g g f f g g g c cd g g g c cd g g g f f f g g g f c cd g g g a b g f f	28/10/20 1.065-1. 1.066 1.077 1.075 1.066 1.071 1.071 1.066 1.065 1.065 1.078 1.076 1.065 1.065 1.065 1.065 1.078 1.076 1.065 1.078 1.076 1.065 1.078	022 110 h h cd def h h g g h h h c cde h h h

A small number of rots were present at harvest. There was no overall significant effect of Nemathorin on the development of rots. However, for Cinderella alone, Nemathorin application resulted in a significantly increased number of rots (from 0 to 3.3%) at the initial assessment (24/09/2022). This small difference is not considered to be of importance.

The dry matter (and related assessment of specific gravity) was, as expected, found to vary significantly between varieties. For five varieties (Cara, Elland, Eurostar, Buster, and Lanorma) the dry matter was under 18%. This low dry matter may result in poor taste and texture characteristics of some varieties for fresh market use. However, in this trial, the somewhat high Nitrogen rate applied (210 kg/ha) uniformly across all varieties and treatments is likely to have had a detrimental effect on dry matter development and the development of variety-specific agronomy protocols should address this issue. In contrast, a high dry matter relative to other varieties for Cinderella (21.6%) might be considered too high for general pre-pack use.

A small, but significant difference in the dry matter in response to Nemathorin application (+ 0.2%) was observed.

Internal defects (Spraing, Hollow Heart, and Internal rust spot)

Spraing was observed only in the variety Cara (Table 5). Application of Nemathorin resulted in a significant reduction in the incidence of Spraing (5.0% to 2.5%).

Hollow heart and internal rust spot were both observed at trace levels only with no significant difference between varieties or in response to Nemathorin treatment.

Initial PCN population (Pi) and PCN population after harvest (Pf)

The initial population was determined for each plot and *G. pallida* was the only species detected. Variation across the site result in some significant differences between the initial population for the varieties (Table 6). The lowest Pi was recorded for the Cara (20.4 eggs/gram) and the highest for Maris Peer (43.5 eggs/gram) (Figure 2). There was however no significant difference recorded between the treated and untreated plots of any individual variety. Variation across small areas within a field trial is inevitable but this trial would appear to be more uniform than others.

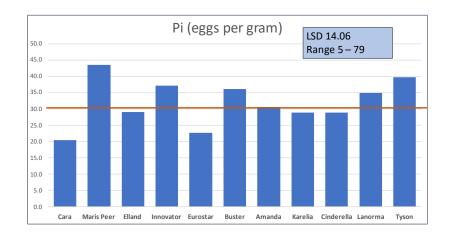


Figure 2: Average PCN population (eggs per gram) at planting for each variety (mean of treated and untreated). Orange bar – Average number of eggs per gram across varieties.

Table 5: Incidence of Spraing, Hollow heart, and Internal rust spot (IRS)

T	Sprain		Hollow H		IRS	
Treatment	01/11/20)22	01/11/20 %)22	01/11/2 %	022
Cara	3.8	а	0.0	а	0.5	а
Maris Peer	0.0	b	0.0	а	0.0	a
Elland	0.0	b	0.3	а	0.8	a
Innovator	0.0	b	0.0	а	0.3	a
Eurostar	0.0	b	0.0	а	0.8	a
Buster	0.0	b	0.3	а	0.0	a
Amanda	0.0	b	0.0	а	0.0	a
Karelia	0.0	b	0.0	а	0.0	a
Cinderella	0.0	b	0.0	а	0.0	a
Lanorma	0.0	b	0.0	а	0.5	a
Tyson	0.0	b	0.5	a	0.3	а
LSD P=.05		1.38		0.54		0.8/
Standard Deviation		1.38		0.54		0.84
Standard Deviation CV		1.39		0.54		0.84 337.08
						37.00
Spraing, hollow heart a						
	Sprain		Hollow H		IRS	
Treatment	01/11/20	022	01/11/20)22	01/11/2	022
	%		%		%	
Untreated	0.2	а	0.1	а	0.2	а
30kg/ha Nemathorin	0.4	а	0.1	а	0.3	а
LSD P=.05		0.57		0.22		0.34
Standard Deviation		1.39		0.54		0.84
CV	4	144.07	5	515.23	3	337.08
Spraing, hollow heart a			- (le \		-	
Spraing, nollow neart al	na internai r	ust spo	ot by varie	ty and	reatmen	τ
	Sprair		Hollow H		IRS	
Treatment	Sprair 01/11/20		Hollow H 01/11/20		01/11/2	
Treatment	01/11/20		Hollow H 01/11/20 %		01/11/2 %	
Treatment Cara Untreated	01/11/20 % 2.5		Hollow H 01/11/20 % 0.0		01/11/2 % 0.0	
Treatment Cara Untreated Cara Treated	01/11/20 % 2.5 5.0	022	Hollow H 01/11/20 % 0.0 0.0	b b	01/11/2 % 0.0 1.0	022 b ab
Treatment Cara Untreated Cara Treated Maris Peer Untreated	01/11/20 % 2.5 5.0 0.0	b	Hollow H 01/11/20 % 0.0 0.0 0.0	b b b	01/11/2 % 0.0 1.0 0.0	022 b ab b
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated	01/11/20 % 2.5 5.0	b a	Hollow H 01/11/20 % 0.0 0.0	b b b	01/11/2 % 0.0 1.0	022 b ab b b
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated	01/11/20 % 2.5 5.0 0.0 0.0 0.0	b a c	Hollow H 01/11/20 % 0.0 0.0 0.0 0.0 0.0	b b b b b b	01/11/2 % 0.0 1.0 0.0 0.0 0.0	022 b ab b
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated	01/11/20 % 2.5 5.0 0.0 0.0 0.0 0.0	b a c c c c c	Hollow H 01/11/20 % 0.0 0.0 0.0 0.0 0.0 0.0	b b b b ab	01/11/2 % 0.0 1.0 0.0 0.0 0.0 1.5	022 b ab b b
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated	01/11/20 % 2.5 5.0 0.0 0.0 0.0 0.0 0.0	b a c c c c c c	Hollow H 01/11/20 % 0.0 0.0 0.0 0.0 0.0 0.0 0.5 0.0	b b b b ab b	01/11/2 % 0.0 1.0 0.0 0.0 0.0 1.5 0.5	022 b ab b b b
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated Innovator Treated	01/11/20 % 2.5 5.0 0.0 0.0 0.0 0.0 0.0 0.0	b a c c c c c	Hollow H 01/11/20 % 0.0 0.0 0.0 0.0 0.0 0.5 0.0	b b b b ab b b b	01/11/2 % 0.0 1.0 0.0 0.0 0.0 1.5 0.5	022 b ab b b a a ab b
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated Innovator Treated Eurostar Untreated	01/11/20 % 2.5 5.0 0.0 0.0 0.0 0.0 0.0 0.0 0	b a c c c c c c c c c c c c c c c c c c	Hollow H 01/11/20 % 0.0 0.0 0.0 0.0 0.0 0.5 0.0 0.0	b b b b b ab b b b b b b	01/11/2 % 0.0 1.0 0.0 0.0 0.0 1.5 0.5 0.0 0.5	b ab b a ab b ab ab a
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated	01/11/20 % 2.5 5.0 0.0 0.0 0.0 0.0 0.0 0.0 0	b a c c c c c c c c c c c c c c c c c c	Hollow H 01/11/20 % 0.0 0.0 0.0 0.0 0.0 0.5 0.0 0.0 0.0	b b b b b b b b b b b b b b b b b b b	01/11/2 % 0.0 1.0 0.0 0.0 0.0 1.5 0.5 0.0 0.5	b ab b a ab b ab ab ab
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated Buster Untreated	01/11/20 % 2.5 5.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	b a c c c c c c c c c c c c c c c c c c	Hollow H 01/11/20 % 0.0 0.0 0.0 0.0 0.0 0.5 0.0 0.0 0.0 0.0	b b b b b b b b b b b b b b b b b b b	01/11/2 % 0.0 1.0 0.0 0.0 0.0 1.5 0.5 0.0 0.5 1.0	b ab b a ab b ab ab ab b
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated Buster Untreated Buster Treated	01/11/20 % 2.5 5.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	b a c c c c c c c c c c c c c c c c c c	Hollow H 01/11/20 % 0.0 0.0 0.0 0.0 0.0 0.5 0.0 0.0 0.0 0.0	b b b b b b b b b b b b b b ab b b ab b	01/11/2 % 0.0 1.0 0.0 0.0 0.0 1.5 0.5 0.0 0.5 1.0 0.0	b ab b aab b aab ab b b
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated Buster Untreated Buster Untreated Amanda Untreated	01/11/20 % 2.5 5.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	b a c c c c c c c c c c c c c c c c c c	Hollow H 01/11/20 % 0.0 0.0 0.0 0.0 0.0 0.5 0.0 0.0 0.0 0.0	b b b b b b b b b b b b b b b b b b b	01/11/2 % 0.0 1.0 0.0 0.0 0.0 1.5 0.5 0.0 0.5 1.0 0.0 0.0	b ab b ab ab b b
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated Eurostar Untreated Eurostar Treated Eurostar Treated Buster Untreated Buster Untreated Amanda Untreated Amanda Untreated	01/11/20 % 2.5 5.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	b a c c c c c c c c c c c c c c c c c c	Hollow H 01/11/20 % 0.0 0.0 0.0 0.0 0.0 0.5 0.0 0.0 0.0 0.0	b b b b b b b b b b b b b b b b b b b	01/11/2 % 0.0 1.0 0.0 0.0 0.0 1.5 0.5 0.0 0.5 1.0 0.0 0.0	b ab b b aab b b b b b b b b b b b b b
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated Buster Untreated Buster Untreated Amanda Untreated Amanda Untreated Karelia Untreated	01/11/20 % 2.5 5.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	b a c c c c c c c c c c c c c c c c c c	Hollow H 01/11/20 % 0.0 0.0 0.0 0.0 0.0 0.5 0.0 0.0 0.0 0.0	b b b b b b b b b b b b b b b b b b b	01/11/2 % 0.0 1.0 0.0 0.0 0.0 1.5 0.5 0.0 0.5 1.0 0.0 0.0 0.0	b ab b b ab b b b b b b b b b b b b b b
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated Eurostar Untreated Eurostar Treated Buster Untreated Buster Untreated Amanda Untreated Amanda Untreated Karelia Untreated Karelia Treated	01/11/20 % 2.5 5.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	b a c c c c c c c c c c c c c c c c c c	Hollow H 01/11/20 % 0.0 0.0 0.0 0.0 0.0 0.5 0.0 0.0 0.0 0.0	D22	01/11/2 % 0.0 1.0 0.0 0.0 0.0 1.5 0.5 0.0 0.5 1.0 0.0 0.0 0.0 0.0	b abb b b abb b b b b b b b b b b b b b
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated Eurostar Untreated Eurostar Treated Buster Untreated Buster Untreated Amanda Untreated Amanda Untreated Karelia Untreated Karelia Untreated Cinderella Untreated	01/11/20 % 2.5 5.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	b a c c c c c c c c c c c c c c c c c c	Hollow H 01/11/20 % 0.0 0.0 0.0 0.0 0.0 0.5 0.0 0.0 0.0 0.0	D22	01/11/2 % 0.0 1.0 0.0 0.0 0.0 1.5 0.5 0.0 0.5 1.0 0.0 0.0 0.0 0.0 0.0	b abb b b abb b b b b b b b b b b b b b
Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated Eurostar Untreated Eurostar Treated Buster Untreated Buster Untreated Amanda Untreated Amanda Untreated Karelia Untreated Karelia Untreated Cinderella Untreated	01/11/20 % 2.5 5.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	b a c c c c c c c c c c c c c c c c c c	Hollow H 01/11/20 % 0.0 0.0 0.0 0.0 0.0 0.5 0.0 0.0 0.0 0.0	D22	01/11/2 % 0.0 1.0 0.0 0.0 0.0 1.5 0.5 0.0 0.5 1.0 0.0 0.0 0.0 0.0 0.0 0.0	b ab b b ab b b b b b b b b b b b b b b
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated Buster Untreated Buster Untreated Amanda Untreated Amanda Untreated Karelia Untreated Karelia Untreated Cinderella Untreated Cinderella Untreated	01/11/20 % 2.5 5.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	b a c c c c c c c c c c c c c c c c c c	Hollow H 01/11/20 % 0.0 0.0 0.0 0.0 0.0 0.5 0.0 0.0 0.0 0.0	D22	01/11/2 % 0.0 1.0 0.0 0.0 0.0 1.5 0.5 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	b abb b b b b b b b b b b ab b b ab b b b b b b b b b b b b b b b b b b b
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated Buster Untreated Buster Untreated Amanda Untreated Amanda Untreated Karelia Untreated Karelia Untreated Cinderella Untreated Lanorma Untreated Lanorma Untreated Lanorma Untreated	01/11/20 % 2.5 5.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	D22 b a c c c c c c c c c	Hollow H 01/11/20 % 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	D22	01/11/2 % 0.0 1.0 0.0 0.0 0.0 1.5 0.5 0.0 0.5 1.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	b abb b b b b b b b b b ab ab abb abb a
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated Buster Untreated Buster Untreated Amanda Untreated Amanda Untreated Cinderella Untreated Cinderella Untreated Lanorma Untreated Cinderella Treated Lanorma Untreated Lanorma Untreated Lanorma Untreated Lanorma Untreated Lanorma Untreated Lanorma Untreated	01/11/20 % 2.5 5.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	D22 b a c c c c c c c c c	Hollow H 01/11/20 % 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	D22	01/11/2 % 0.0 1.0 0.0 0.0 0.0 1.5 0.5 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	b ab b b b b b b b b b ab ab ab ab ab ab
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated	01/11/20 % 2.5 5.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	D22 b a c c c c c c c c c	Hollow H 01/11/20 % 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	D22	01/11/2 % 0.0 1.0 0.0 0.0 0.0 1.5 0.5 0.0 0.5 1.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	b ab b b b b b b b b b b ab ab ab ab ab
Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Untreated Maris Peer Treated Elland Untreated Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated Buster Untreated Buster Untreated Amanda Untreated Amanda Untreated Cinderella Untreated Karelia Untreated Cinderella Untreated Cinderella Untreated Lanorma Untreated Lanorma Untreated Lanorma Untreated Tyson Untreated	01/11/20 % 2.5 5.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	D22 b a c c c c c c c c c	Hollow H 01/11/20 % 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	D22	01/11/2 % 0.0 1.0 0.0 0.0 0.0 1.5 0.5 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	b abb b b b b b b b b b b b b b b b b b
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated Buster Untreated Buster Untreated Amanda Untreated Amanda Untreated Cinderella Untreated Cinderella Untreated Lanorma Untreated Cinderella Treated Lanorma Untreated Lanorma Untreated Lanorma Untreated Lanorma Untreated Lanorma Untreated Lanorma Untreated	01/11/20 % 2.5 5.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	D22 b a c c c c c c c c c	Hollow H 01/11/20 % 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	b b b b b b b b b b b b b b b b b b b	01/11/2 % 0.0 1.0 0.0 0.0 0.0 1.5 0.5 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	b ab b b b b b b b b b ab ab ab ab ab ab

<u>Table 6: Analysis of Initial PCN population (Pi) (15/05/22022) and after harvest (Pf) (27/09/2022)</u>
expressed as eggs per gram of soil and number of viable cysts.

		Faar	s/Larvae p	or a so	.il	,	Viable	Cysts per	200 a	soil
T	45/05/00		-							
Treatment	15/05/20)22	27/09/20	122	27/09/2022	15/05/20)22	27/09/20	22	27/09/2022
	Pi		Pf		Pf/Pi	Pi		Pf		Pf/Pi
Cara	20.4	d	499.8	а	24.50	150.5	ab	1270.9	а	8.44
Maris Peer	43.5	а	309.0	b	7.10	199.6	ab	998.3	b	5.00
Elland	29.0	bcd	1.4	С	0.05	164.6	ab	20.9	de	0.13
Innovator	37.1	ab	2.9	С	0.08	194.1	ab	21.0	de	0.11
Eurostar	22.6	cd	11.9	С	0.53	143.3	b	53.5	de	0.37
Buster	36.1	abc	0.9	С	0.02	175.0	ab	7.6	е	0.04
Amanda	30.5	a-d	4.1	С	0.13	153.6	ab	34.8	de	0.23
Karelia	28.8	bcd	5.8	С	0.20	171.5	ab	30.1	de	0.23
Cinderella										
	28.9	bcd	68.0	C	2.35	157.5	ab	201.8	d	1.28
Lanorma	34.9	abc	290.9	b	8.34	192.9	ab	760.6	С	3.94
Tyson	39.6	ab	368.5	b	9.31	214.0	а	1004.8	b	4.70
LSD P=.05		14.06		83.38			66.58	10	90.78	
Standard Deviation		14.09		83.59			66.75		91.27	
CV		44.71		63.54			38.44		51.52	
Soil Analysis by Treatm	<u>ent</u>									
			-/		:1	,	\/:-I-I-	0	000	!
			s/Larvae p					Cysts per		
Treatment	15/05/20)22	27/09/20	22	27/09/2022	15/05/20)22	27/09/20	22	27/09/2022
	Pi		Pf		Pf/Pi	Pi	,	Pf	,	Pf/Pi
Untreated	32.1	а	141.4	а	4.40	189.0	а	400.5	а	2.12
30kg/ha Nemathorin	30.9	а	121.7	а	3.94	158.4	b	342.1	а	2.16
LSD P=.05		5.74		34.04			27.18		77.89	
Standard Deviation		14.09		83.59			66.75		91.27	
Standard Deviation		14.09		03.59			00.75	13	91.21	
O) /		44-4		00 = 4			00 44		- 4	
		44.71 ent		63.54			38.44		51.52	
CV Soil Analysis by Variety		ent_	s/l arvaa n		ii					soil
Soil Analysis by Variety	and Treatme	ent Egg:	s/Larvae p	er g so		,	Viable	Cysts per	200 g	
	and Treatme	ent Egg:	27/09/20	er g so	27/09/2022	15/05/20	Viable	Cysts per 27/09/20	200 g	27/09/2022
Soil Analysis by Variety Treatment	15/05/20	Egg:	27/09/20 Pf	er g so	27/09/2022 Pf/Pi	15/05/20 Pi	Viable 022	Cysts per 27/09/20 Pf	200 g	27/09/2022 Pf/Pi
Soil Analysis by Variety Treatment Cara Untreated	15/05/20 Pi 21.3	Egg:	27/09/20 Pf 527.8	er g so 122	27/09/2022 Pf/Pi 24.78	15/05/20 Pi 133.3	Viable 022	Cysts per 27/09/20 Pf 1322.8	200 g 222	27/09/2022 Pf/Pi 9.92
Soil Analysis by Variety Treatment Cara Untreated Cara Treated	15/05/20 Pi 21.3 19.5	Egg:	27/09/20 Pf 527.8 471.8	er g so 222 a	27/09/2022 Pf/Pi 24.78 24.19	15/05/20 Pi 133.3 167.8	Viable 022 bc abc	Cysts per 27/09/20 Pf 1322.8 1219.0	200 g 22 a ab	27/09/2022 Pf/Pi 9.92 7.26
Soil Analysis by Variety Treatment Cara Untreated Cara Treated Maris Peer Untreated	15/05/20 Pi 21.3 19.5 45.5	Eggs 022 def ef a	27/09/20 Pf 527.8 471.8 361.8	er g so 122 a ab bcd	27/09/2022 Pf/Pi 24.78 24.19 7.95	15/05/20 Pi 133.3 167.8 224.3	Viable 022 bc abc abc ab	Cysts per 27/09/20 Pf 1322.8 1219.0 1153.8	200 g 222 a ab ab	27/09/2022 Pf/Pi 9.92 7.26 5.14
Soil Analysis by Variety Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated	15/05/20 Pi 21.3 19.5 45.5 41.5	Egg:	27/09/20 Pf 527.8 471.8 361.8 256.3	er g so 22 a ab bcd d	27/09/2022 Pf/Pi 24.78 24.19 7.95 6.18	15/05/20 Pi 133.3 167.8 224.3 175.0	Viable 022 bc abc ab abc	Cysts per 27/09/20 Pf 1322.8 1219.0 1153.8 842.8	200 g 22 a ab ab ab	27/09/2022 Pf/Pi 9.92 7.26 5.14 4.82
Soil Analysis by Variety Treatment	15/05/20 Pi 21.3 19.5 45.5	Egg: Odef ef a abc a-f	27/09/20 Pf 527.8 471.8 361.8	er g so 122 a ab bcd	27/09/2022 Pf/Pi 24.78 24.19 7.95 6.18 0.06	15/05/20 Pi 133.3 167.8 224.3	Viable 022 bc abc abc ab	Cysts per 27/09/20 Pf 1322.8 1219.0 1153.8 842.8 27.8	200 g 222 a ab ab	27/09/2022 Pf/Pi 9.92 7.26 5.14
Soil Analysis by Variety Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated	15/05/20 Pi 21.3 19.5 45.5 41.5	Egg:	27/09/20 Pf 527.8 471.8 361.8 256.3	er g so 22 a ab bcd d	27/09/2022 Pf/Pi 24.78 24.19 7.95 6.18	15/05/20 Pi 133.3 167.8 224.3 175.0	Viable 022 bc abc ab abc	Cysts per 27/09/20 Pf 1322.8 1219.0 1153.8 842.8	200 g 22 a ab ab ab	27/09/2022 Pf/Pi 9.92 7.26 5.14 4.82
Soil Analysis by Variety Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Untreated	15/05/20 Pi 21.3 19.5 45.5 41.5 31.5	Egg: Odef ef a abc a-f	27/09/20 Pf 527.8 471.8 361.8 256.3 1.8	er g so 22 a ab bcd d e	27/09/2022 Pf/Pi 24.78 24.19 7.95 6.18 0.06	15/05/20 Pi 133.3 167.8 224.3 175.0 189.0	bc abc abc abc abc	Cysts per 27/09/20 Pf 1322.8 1219.0 1153.8 842.8 27.8	200 g 22 a ab ab cd	27/09/2022 Pf/Pi 9.92 7.26 5.14 4.82 0.15
Soil Analysis by Variety Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated	15/05/20 Pi 21.3 19.5 45.5 41.5 31.5 26.5	Egg: Odef ef ef a abc a-f a-f	27/09/20 Pf 527.8 471.8 361.8 256.3 1.8 1.0	er g so 222 a ab bcd d e e	27/09/2022 Pf/Pi 24.78 24.19 7.95 6.18 0.06 0.04	15/05/20 Pi 133.3 167.8 224.3 175.0 189.0 140.3	bc abc abc abc abc bc	Cysts per 27/09/20 Pf 1322.8 1219.0 1153.8 842.8 27.8 14.0	200 g 222 a ab ab cd e e	27/09/2022 Pf/Pi 9.92 7.26 5.14 4.82 0.15 0.10
Soil Analysis by Variety Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated Innovator Treated	15/05/20 Pi 21.3 19.5 45.5 41.5 31.5 26.5 32.0 42.3	ent Egg: 022 def ef a abc a-f a-f ab	27/09/20 Pf 527.8 471.8 361.8 256.3 1.8 1.0 5.3 0.5	er g so 22 a ab bcd d e e e e e	27/09/2022 Pf/Pi 24.78 24.19 7.95 6.18 0.06 0.04 0.17 0.01	15/05/20 Pi 133.3 167.8 224.3 175.0 189.0 140.3 197.5	bc abc abc bc ab cabc abc abc abc abc ab	Cysts per 27/09/20 Pf 1322.8 1219.0 1153.8 842.8 27.8 14.0 29.8 12.3	200 g 22 a ab ab cd e e e e	27/09/2022 Pf/Pi 9.92 7.26 5.14 4.82 0.15 0.10 0.15 0.06
Soil Analysis by Variety Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated Innovator Treated Eurostar Untreated	15/05/20 Pi 21.3 19.5 45.5 41.5 31.5 26.5 32.0 42.3 27.0	Eggs D22 def ef a abc a-f a-f ab a-f	27/09/20 Pf 527.8 471.8 361.8 256.3 1.8 1.0 5.3 0.5	er g so 222 a ab bcd d e e e e e	27/09/2022 Pf/Pi 24.78 24.19 7.95 6.18 0.06 0.04 0.17 0.01 0.62	15/05/20 Pi 133.3 167.8 224.3 175.0 189.0 140.3 197.5 190.8 185.5	bc abc abc bc ab abc abc abc abc abc abc	Cysts per 27/09/20 Pf 1322.8 1219.0 1153.8 842.8 27.8 14.0 29.8 12.3 66.5	200 g 22 a ab ab cd e e e e e	27/09/2022 Pf/Pi 9.92 7.26 5.14 4.82 0.15 0.10 0.15 0.06 0.36
Soil Analysis by Variety Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated Eurostar Treated	15/05/20 Pi 21.3 19.5 45.5 41.5 31.5 26.5 32.0 42.3 27.0 18.3	Eggs D22 def ef a abc a-f a-f ab a-f f	27/09/20 Pf 527.8 471.8 361.8 256.3 1.8 1.0 5.3 0.5 16.8 7.0	er g so 222 a ab bcd d e e e e e e	27/09/2022 Pf/Pi 24.78 24.19 7.95 6.18 0.06 0.04 0.17 0.01 0.62 0.38	15/05/20 Pi 133.3 167.8 224.3 175.0 189.0 140.3 197.5 190.8 185.5 101.0	bc abc abc bc ab abc abc abc abc abc acc abc acc ac	Cysts per 27/09/20 Pf 1322.8 1219.0 1153.8 842.8 27.8 14.0 29.8 12.3 66.5 40.5	200 g 22 a ab ab cd e e e e e e	27/09/2022 Pf/Pi 9.92 7.26 5.14 4.82 0.15 0.10 0.15 0.06 0.36 0.40
Soil Analysis by Variety Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Untreated Eurostar Untreated Buster Untreated	15/05/20 Pi 21.3 19.5 45.5 41.5 31.5 26.5 32.0 42.3 27.0 18.3 34.5	ent Eggs D22 def ef a abc a-f a-f ab a-f f a-f a-f	27/09/20 Pf 527.8 471.8 361.8 256.3 1.8 1.0 5.3 0.5 16.8 7.0 1.8	a ab bcd d e e e e e e e e e	27/09/2022 Pf/Pi 24.78 24.19 7.95 6.18 0.06 0.04 0.17 0.01 0.62 0.38 0.05	15/05/20 Pi 133.3 167.8 224.3 175.0 189.0 140.3 197.5 190.8 185.5 101.0 167.5	bc abc abc ab abc abc abc abc abc abc ab	Cysts per 27/09/20 Pf 1322.8 1219.0 1153.8 842.8 27.8 14.0 29.8 12.3 66.5 40.5 10.3	200 g 222 a ab ab cd e e e e e e e e e e	27/09/2022 Pf/Pi 9.92 7.26 5.14 4.82 0.15 0.10 0.15 0.06 0.36 0.40 0.06
Soil Analysis by Variety Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated Buster Untreated Buster Untreated Buster Untreated Buster Treated	15/05/20 Pi 21.3 19.5 45.5 41.5 31.5 26.5 32.0 42.3 27.0 18.3 34.5 37.8	ent Eggs D22 def ef a abc a-f a-f ab a-f f a-f a-f a-f a-f a-f a-f a-f a-f a	27/09/20 Pf 527.8 471.8 361.8 256.3 1.8 1.0 5.3 0.5 16.8 7.0 1.8 0.0	a ab bcd d e e e e e e e e e e e	27/09/2022 Pf/Pi 24.78 24.19 7.95 6.18 0.06 0.04 0.17 0.01 0.62 0.38 0.05 0.00	15/05/20 Pi 133.3 167.8 224.3 175.0 189.0 140.3 197.5 190.8 185.5 101.0 167.5 182.5	bc abc abc abc abc abc abc abc abc abc a	Cysts per 27/09/20 Pf 1322.8 1219.0 1153.8 842.8 27.8 14.0 29.8 12.3 66.5 40.5 10.3 5.0	200 g 222 a ab cd e e e e e e e e e e e e e e e e e e	27/09/2022 Pf/Pi 9.92 7.26 5.14 4.82 0.15 0.10 0.15 0.06 0.36 0.40 0.06 0.03
Soil Analysis by Variety Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated Buster Untreated Buster Untreated Buster Untreated Amanda Untreated	15/05/20 Pi 21.3 19.5 45.5 41.5 31.5 26.5 32.0 42.3 27.0 18.3 34.5 37.8 27.0	ent Eggs D22 def ef a abc a-f	27/09/20 Pf 527.8 471.8 361.8 256.3 1.8 1.0 5.3 0.5 16.8 7.0 1.8 0.0 5.5	a ab bcd d e e e e e e e e e e e e e e e	27/09/2022 Pf/Pi 24.78 24.19 7.95 6.18 0.06 0.04 0.17 0.01 0.62 0.38 0.05 0.00 0.20	15/05/20 Pi 133.3 167.8 224.3 175.0 189.0 140.3 197.5 190.8 185.5 101.0 167.5 182.5	bc abc abc abc abc abc abc abc abc abc a	Cysts per 27/09/20 Pf 1322.8 1219.0 1153.8 842.8 27.8 14.0 29.8 12.3 66.5 40.5 10.3 5.0 25.0	200 g 22 a ab ab cd e e e e e e e e e e e e e e e e e e	27/09/2022 Pf/Pi 9.92 7.26 5.14 4.82 0.15 0.10 0.15 0.06 0.36 0.40 0.06 0.03 0.16
Soil Analysis by Variety Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Untreated Elland Untreated Elland Treated Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Untreated Buster Untreated Buster Untreated Buster Treated Amanda Untreated Amanda Treated	and Treatme 15/05/20 Pi 21.3 19.5 45.5 41.5 31.5 26.5 32.0 42.3 27.0 18.3 34.5 37.8 27.0 34.0	ent Eggs D22 def ef a abc a-f a-f ab a-f f a-f a-f a-f a-f a-f a-f a-f a-f a	27/09/20 Pf 527.8 471.8 361.8 256.3 1.8 1.0 5.3 0.5 16.8 7.0 1.8 0.0 5.5 2.8	er g so 222 a ab bcd d e e e e e e e e e e e	27/09/2022 Pf/Pi 24.78 24.19 7.95 6.18 0.06 0.04 0.17 0.01 0.62 0.38 0.05 0.00 0.20 0.08	15/05/20 Pi 133.3 167.8 224.3 175.0 189.0 140.3 197.5 190.8 185.5 101.0 167.5 182.5 155.3 152.0	Viable D22 bc abc abc abc abc abc abc abc abc abc	Cysts per 27/09/20 Pf 1322.8 1219.0 1153.8 842.8 27.8 14.0 29.8 12.3 66.5 40.5 10.3 5.0 25.0 44.5	200 g 22 a ab ab cd e e e e e e e e e e e e e e e e e e	27/09/2022 Pf/Pi 9.92 7.26 5.14 4.82 0.15 0.10 0.15 0.06 0.36 0.40 0.06 0.03 0.16 0.29
Soil Analysis by Variety Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Untreated Elland Untreated Elland Treated Innovator Untreated Eurostar Untreated Eurostar Untreated Eurostar Treated Buster Untreated Buster Untreated Amanda Untreated Amanda Treated Karelia Untreated Karelia Untreated	15/05/20 Pi 21.3 19.5 45.5 41.5 31.5 26.5 32.0 42.3 27.0 18.3 34.5 37.8 27.0 34.0 35.8	ent Eggs D22 def ef a abc a-f a-f ab a-f f a-f a-f a-f a-f a-f a-f a-f a-f a	27/09/20 Pf 527.8 471.8 361.8 256.3 1.8 1.0 5.3 0.5 16.8 7.0 1.8 0.0 5.5 2.8 7.3	a ab bcd d e e e e e e e e e e e e e e e e e e	27/09/2022 Pf/Pi 24.78 24.19 7.95 6.18 0.06 0.04 0.17 0.01 0.62 0.38 0.05 0.00 0.20 0.08 0.20	15/05/20 Pi 133.3 167.8 224.3 175.0 189.0 140.3 197.5 190.8 185.5 101.0 167.5 182.5 155.3 152.0 207.8	bc abc abc abc abc abc abc abc abc abc a	Cysts per 27/09/20 Pf 1322.8 1219.0 1153.8 842.8 27.8 14.0 29.8 12.3 66.5 40.5 10.3 5.0 25.0 44.5 35.8	200 g 22 a ab ab cd e e e e e e e e e e e e e e e e e e	27/09/2022 Pf/Pi 9.92 7.26 5.14 4.82 0.15 0.10 0.15 0.06 0.36 0.40 0.06 0.03 0.16 0.29 0.17
Soil Analysis by Variety Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Untreated Elland Untreated Innovator Untreated Innovator Untreated Eurostar Untreated Eurostar Untreated Buster Untreated Buster Untreated Amanda Untreated Amanda Untreated Karelia Untreated Karelia Untreated	15/05/20 Pi 21.3 19.5 45.5 41.5 31.5 26.5 32.0 42.3 27.0 18.3 34.5 37.8 27.0 34.0 35.8 21.8	ent Eggs D22 def ef a abc a-f	27/09/20 Pf 527.8 471.8 361.8 256.3 1.8 1.0 5.3 0.5 16.8 7.0 1.8 0.0 5.5 2.8 7.3 4.3	er g so 222 a ab bcd d e e e e e e e e e e e	27/09/2022 Pf/Pi 24.78 24.19 7.95 6.18 0.06 0.04 0.17 0.01 0.62 0.38 0.05 0.00 0.20 0.08 0.20 0.20	15/05/20 Pi 133.3 167.8 224.3 175.0 189.0 140.3 197.5 190.8 185.5 101.0 167.5 182.5 155.3 152.0 207.8 135.3	Viable D22 bc abc abc abc abc abc abc abc abc abc	Cysts per 27/09/20 Pf 1322.8 1219.0 1153.8 842.8 27.8 14.0 29.8 12.3 66.5 40.5 10.3 5.0 25.0 44.5 35.8 24.5	200 g 22 a ab ab cd e e e e e e e e e e e e e e e e e e	27/09/2022 Pf/Pi 9.92 7.26 5.14 4.82 0.15 0.10 0.15 0.06 0.36 0.40 0.06 0.03 0.16 0.29 0.17 0.18
Soil Analysis by Variety Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Untreated Elland Untreated Innovator Untreated Innovator Untreated Eurostar Untreated Eurostar Treated Eurostar Treated Buster Untreated Buster Untreated Amanda Untreated Amanda Untreated Karelia Untreated Karelia Untreated	15/05/20 Pi 21.3 19.5 45.5 41.5 31.5 26.5 32.0 42.3 27.0 18.3 34.5 37.8 27.0 34.0 35.8	ent Eggs D22 def ef a abc a-f a-f ab a-f f a-f a-f a-f a-f a-f a-f a-f a-f a	27/09/20 Pf 527.8 471.8 361.8 256.3 1.8 1.0 5.3 0.5 16.8 7.0 1.8 0.0 5.5 2.8 7.3	a ab bcd d e e e e e e e e e e e e e e e e e e	27/09/2022 Pf/Pi 24.78 24.19 7.95 6.18 0.06 0.04 0.17 0.01 0.62 0.38 0.05 0.00 0.20 0.08 0.20	15/05/20 Pi 133.3 167.8 224.3 175.0 189.0 140.3 197.5 190.8 185.5 101.0 167.5 182.5 155.3 152.0 207.8	bc abc abc abc abc abc abc abc abc abc a	Cysts per 27/09/20 Pf 1322.8 1219.0 1153.8 842.8 27.8 14.0 29.8 12.3 66.5 40.5 10.3 5.0 25.0 44.5 35.8	200 g 22 a ab ab cd e e e e e e e e e e e e e e e e e e	27/09/2022 Pf/Pi 9.92 7.26 5.14 4.82 0.15 0.10 0.15 0.06 0.36 0.40 0.06 0.03 0.16 0.29 0.17
Soil Analysis by Variety Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Untreated Elland Untreated Elland Treated Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated Buster Untreated Buster Untreated Amanda Untreated Amanda Untreated Karelia Untreated Karelia Untreated Karelia Untreated Cinderella Untreated	15/05/20 Pi 21.3 19.5 45.5 41.5 31.5 26.5 32.0 42.3 27.0 18.3 34.5 37.8 27.0 34.0 35.8 21.8	ent Eggs D22 def ef a abc a-f	27/09/20 Pf 527.8 471.8 361.8 256.3 1.8 1.0 5.3 0.5 16.8 7.0 1.8 0.0 5.5 2.8 7.3 4.3	a ab bcd d e e e e e e e e e e e e e e e e e e	27/09/2022 Pf/Pi 24.78 24.19 7.95 6.18 0.06 0.04 0.17 0.01 0.62 0.38 0.05 0.00 0.20 0.08 0.20 0.20	15/05/20 Pi 133.3 167.8 224.3 175.0 189.0 140.3 197.5 190.8 185.5 101.0 167.5 182.5 155.3 152.0 207.8 135.3	bc abc abc abc abc abc abc abc abc abc a	Cysts per 27/09/20 Pf 1322.8 1219.0 1153.8 842.8 27.8 14.0 29.8 12.3 66.5 40.5 10.3 5.0 25.0 44.5 35.8 24.5	200 g 22 a ab ab cd e e e e e e e e e e e e e e e e e e	27/09/2022 Pf/Pi 9.92 7.26 5.14 4.82 0.15 0.10 0.15 0.06 0.36 0.40 0.06 0.03 0.16 0.29 0.17 0.18
Soil Analysis by Variety Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Untreated Elland Untreated Elland Treated Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Untreated Buster Untreated Buster Untreated Amanda Untreated Amanda Untreated Karelia Untreated Karelia Untreated Cinderella Untreated	15/05/20 Pi 21.3 19.5 45.5 41.5 31.5 26.5 32.0 42.3 27.0 18.3 34.5 37.8 27.0 34.0 35.8 21.8 25.5	ent Eggs D22 def ef a abc a-f	27/09/20 Pf 527.8 471.8 361.8 256.3 1.8 1.0 5.3 0.5 16.8 7.0 1.8 0.0 5.5 2.8 7.3 4.3 86.8	a ab bcd d e e e e e e e e e e e e e e e e e e	27/09/2022 Pf/Pi 24.78 24.19 7.95 6.18 0.06 0.04 0.17 0.01 0.62 0.38 0.05 0.00 0.20 0.08 0.20 0.20 3.40 1.53	15/05/20 Pi 133.3 167.8 224.3 175.0 189.0 140.3 197.5 190.8 185.5 101.0 167.5 182.5 155.3 152.0 207.8 135.3	bc abc abc abc abc bc abc bc abc bc abc a	Cysts per 27/09/20 Pf 1322.8 1219.0 1153.8 842.8 27.8 14.0 29.8 12.3 66.5 40.5 10.3 5.0 25.0 44.5 35.8 24.5 242.5	200 g 22 a ab ab cd e e e e e e e e e e e e e e e e e e	27/09/2022 Pf/Pi 9.92 7.26 5.14 4.82 0.15 0.10 0.15 0.06 0.36 0.40 0.06 0.03 0.16 0.29 0.17 0.18 1.53
Soil Analysis by Variety Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Untreated Elland Untreated Elland Treated Innovator Untreated Innovator Untreated Eurostar Untreated Eurostar Treated Buster Untreated Buster Untreated Amanda Untreated Amanda Untreated Karelia Untreated Karelia Untreated Cinderella Untreated Cinderella Treated Lanorma Untreated	15/05/20 Pi 21.3 19.5 45.5 41.5 31.5 26.5 32.0 42.3 27.0 18.3 34.5 37.8 27.0 34.0 35.8 21.8 25.5 32.3 39.0	ent Eggs D22 def ef a abc a-f	27/09/20 Pf 527.8 471.8 361.8 256.3 1.8 1.0 5.3 0.5 16.8 7.0 1.8 0.0 5.5 2.8 7.3 4.3 86.8 49.3 321.8	a ab bcd d e e e e e e e e e e e e e e e e e e	27/09/2022 Pf/Pi 24.78 24.19 7.95 6.18 0.06 0.04 0.17 0.01 0.62 0.38 0.05 0.00 0.20 0.08 0.20 0.20 3.40 1.53 8.25	15/05/20 Pi 133.3 167.8 224.3 175.0 189.0 140.3 197.5 190.8 185.5 101.0 167.5 182.5 155.3 152.0 207.8 135.3 158.8 156.3 204.5	bc abc abc abc bc abc bc abc abc abc abc	Cysts per 27/09/20 Pf 1322.8 1219.0 1153.8 842.8 27.8 14.0 29.8 12.3 66.5 40.5 10.3 5.0 25.0 44.5 35.8 24.5 242.5 161.0 842.8	200 g 22 a ab ab cd e e e e e e e e e e e e e e e e e e	27/09/2022 Pf/Pi 9.92 7.26 5.14 4.82 0.15 0.10 0.15 0.06 0.36 0.40 0.06 0.03 0.16 0.29 0.17 0.18 1.53 1.03 4.12
Soil Analysis by Variety Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Untreated Elland Untreated Elland Treated Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Untreated Buster Untreated Buster Untreated Amanda Untreated Amanda Untreated Karelia Untreated Karelia Untreated Cinderella Untreated Cinderella Untreated Lanorma Untreated Lanorma Untreated Lanorma Untreated Lanorma Treated	and Treatme 15/05/20 Pi 21.3 19.5 45.5 41.5 31.5 26.5 32.0 42.3 27.0 18.3 34.5 37.8 27.0 34.0 35.8 21.8 25.5 32.3 39.0 30.8	ent Egg: Odef ef a abc a-f	27/09/20 Pf 527.8 471.8 361.8 256.3 1.8 1.0 5.3 0.5 16.8 7.0 1.8 0.0 5.5 2.8 7.3 4.3 86.8 49.3 321.8	a ab bcd d e e e e e e e e e e e e e e e cd d	27/09/2022 Pf/Pi 24.78 24.19 7.95 6.18 0.06 0.04 0.17 0.01 0.62 0.38 0.05 0.00 0.20 0.08 0.20 0.20 3.40 1.53 8.25 8.44	15/05/20 Pi 133.3 167.8 224.3 175.0 189.0 140.3 197.5 190.8 185.5 101.0 167.5 182.5 155.3 152.0 207.8 135.3 158.8 156.3 204.5 181.3	bc abc abc abc bc ab bc abc abc abc abc	Cysts per 27/09/20 Pf 1322.8 1219.0 1153.8 842.8 27.8 14.0 29.8 12.3 66.5 40.5 10.3 5.0 25.0 44.5 35.8 24.5 242.5 161.0 842.8 678.5	200 g 22 a ab ab cd e e e e e e e e e e e e e e e e cd d	27/09/2022 Pf/Pi 9.92 7.26 5.14 4.82 0.15 0.10 0.15 0.06 0.36 0.40 0.06 0.03 0.16 0.29 0.17 0.18 1.53 1.03 4.12 3.74
Soil Analysis by Variety Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Untreated Elland Untreated Innovator Untreated Innovator Untreated Eurostar Untreated Eurostar Untreated Eurostar Treated Eurostar Treated Buster Untreated Amanda Untreated Amanda Untreated Karelia Untreated Karelia Untreated Cinderella Untreated Cinderella Untreated Lanorma Untreated Lanorma Untreated Lanorma Untreated Lanorma Untreated Lanorma Treated	15/05/20 Pi 21.3 19.5 45.5 41.5 31.5 26.5 32.0 42.3 27.0 18.3 34.5 37.8 27.0 34.0 35.8 21.8 25.5 32.3 39.0 30.8 39.3	ent Egg: Odef ef a abc a-f	27/09/20 Pf 527.8 471.8 361.8 256.3 1.8 1.0 5.3 0.5 16.8 7.0 1.8 0.0 5.5 2.8 7.3 4.3 86.8 49.3 321.8 260.0 344.0	a ab bcd d e e e e e e e e e e e e e e cd d cd	27/09/2022 Pf/Pi 24.78 24.19 7.95 6.18 0.06 0.04 0.17 0.01 0.62 0.38 0.05 0.00 0.20 0.08 0.20 0.20 3.40 1.53 8.25 8.44 8.75	15/05/20 Pi 133.3 167.8 224.3 175.0 189.0 140.3 197.5 190.8 185.5 101.0 167.5 182.5 155.3 152.0 207.8 135.3 158.8 156.3 204.5 181.3	Viable D22 bc abc abc abc abc abc abc bc abc bc abc a	Cysts per 27/09/20 Pf 1322.8 1219.0 1153.8 842.8 27.8 14.0 29.8 12.3 66.5 40.5 10.3 5.0 25.0 44.5 35.8 24.5 242.5 161.0 842.8 678.5 987.8	200 g 22 a ab ab cd e e e e e e e e e e e e e e e cd d bc	27/09/2022 Pf/Pi 9.92 7.26 5.14 4.82 0.15 0.10 0.15 0.06 0.36 0.40 0.06 0.03 0.16 0.29 0.17 0.18 1.53 1.03 4.12 3.74 3.96
Soil Analysis by Variety Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Untreated Elland Untreated Innovator Untreated Innovator Untreated Eurostar Untreated Eurostar Untreated Eurostar Treated Eurostar Treated Buster Untreated Amanda Untreated Amanda Untreated Karelia Untreated Karelia Untreated Cinderella Untreated Cinderella Untreated Lanorma Untreated Lanorma Untreated Lanorma Untreated Lanorma Untreated Lanorma Treated	and Treatme 15/05/20 Pi 21.3 19.5 45.5 41.5 31.5 26.5 32.0 42.3 27.0 18.3 34.5 37.8 27.0 34.0 35.8 21.8 25.5 32.3 39.0 30.8	ent Egg: Odef ef a abc a-f	27/09/20 Pf 527.8 471.8 361.8 256.3 1.8 1.0 5.3 0.5 16.8 7.0 1.8 0.0 5.5 2.8 7.3 4.3 86.8 49.3 321.8	a ab bcd d e e e e e e e e e e e e e e e cd d	27/09/2022 Pf/Pi 24.78 24.19 7.95 6.18 0.06 0.04 0.17 0.01 0.62 0.38 0.05 0.00 0.20 0.08 0.20 0.20 3.40 1.53 8.25 8.44	15/05/20 Pi 133.3 167.8 224.3 175.0 189.0 140.3 197.5 190.8 185.5 101.0 167.5 182.5 155.3 152.0 207.8 135.3 158.8 156.3 204.5 181.3	bc abc abc abc bc ab bc abc abc abc abc	Cysts per 27/09/20 Pf 1322.8 1219.0 1153.8 842.8 27.8 14.0 29.8 12.3 66.5 40.5 10.3 5.0 25.0 44.5 35.8 24.5 242.5 161.0 842.8 678.5	200 g 22 a ab ab cd e e e e e e e e e e e e e e e e cd d	27/09/2022 Pf/Pi 9.92 7.26 5.14 4.82 0.15 0.10 0.15 0.06 0.36 0.40 0.06 0.03 0.16 0.29 0.17 0.18 1.53 1.03 4.12 3.74
Soil Analysis by Variety Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Innovator Untreated Innovator Untreated Eurostar Untreated Eurostar Untreated Buster Untreated Buster Untreated Amanda Untreated Amanda Untreated Karelia Untreated Karelia Untreated Cinderella Untreated Cinderella Untreated Lanorma Untreated Lanorma Untreated Lanorma Untreated Lanorma Untreated Lyson Untreated	15/05/20 Pi 21.3 19.5 45.5 41.5 31.5 26.5 32.0 42.3 27.0 18.3 34.5 37.8 27.0 34.0 35.8 21.8 25.5 32.3 39.0 30.8 39.3	ent Egg: D22 def ef a abc a-f	27/09/20 Pf 527.8 471.8 361.8 256.3 1.8 1.0 5.3 0.5 16.8 7.0 1.8 0.0 5.5 2.8 7.3 4.3 86.8 49.3 321.8 260.0 344.0 393.0	er g so 222 a ab bcd d e e e e e e e e e e e e e e e e e e	27/09/2022 Pf/Pi 24.78 24.19 7.95 6.18 0.06 0.04 0.17 0.01 0.62 0.38 0.05 0.00 0.20 0.08 0.20 0.20 3.40 1.53 8.25 8.44 8.75	15/05/20 Pi 133.3 167.8 224.3 175.0 189.0 140.3 197.5 190.8 185.5 101.0 167.5 152.5 152.0 207.8 135.3 158.8 156.3 204.5 181.3 249.5	Viable D22 bc abc abc abc abc abc abc c abc bc abc a	Cysts per 27/09/20 Pf 1322.8 1219.0 1153.8 842.8 27.8 14.0 29.8 12.3 66.5 40.5 10.3 5.0 25.0 44.5 35.8 24.5 242.5 161.0 842.8 678.5 987.8 1021.8	200 g 22 a ab ab cd e e e e e e e e e e e e e e cd d bc bc	27/09/2022 Pf/Pi 9.92 7.26 5.14 4.82 0.15 0.10 0.15 0.06 0.36 0.40 0.06 0.03 0.16 0.29 0.17 0.18 1.53 1.03 4.12 3.74 3.96
Soil Analysis by Variety Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated Buster Untreated Buster Untreated Buster Untreated Amanda Untreated	### and Treatment ### 15/05/20 Pi	ent Egg: Odef ef a abc a-f	27/09/20 Pf 527.8 471.8 361.8 256.3 1.8 1.0 5.3 0.5 16.8 7.0 1.8 0.0 5.5 2.8 7.3 4.3 86.8 49.3 321.8 260.0 344.0 393.0	a ab bcd d e e e e e e e e e e e e e e cd d cd	27/09/2022 Pf/Pi 24.78 24.19 7.95 6.18 0.06 0.04 0.17 0.01 0.62 0.38 0.05 0.00 0.20 0.08 0.20 0.20 3.40 1.53 8.25 8.44 8.75	15/05/20 Pi 133.3 167.8 224.3 175.0 189.0 140.3 197.5 190.8 185.5 101.0 167.5 152.5 155.3 152.0 207.8 135.3 158.8 156.3 204.5 181.3 249.5	Viable D22 bc abc abc abc abc abc abc bc abc bc abc a	Cysts per 27/09/20 Pf 1322.8 1219.0 1153.8 842.8 27.8 14.0 29.8 12.3 66.5 40.5 10.3 5.0 25.0 44.5 35.8 24.5 242.5 161.0 842.8 678.5 987.8 1021.8	200 g 22 a ab ab cd e e e e e e e e e e e e e e e cd d bc	27/09/2022 Pf/Pi 9.92 7.26 5.14 4.82 0.15 0.10 0.15 0.06 0.36 0.40 0.06 0.03 0.16 0.29 0.17 0.18 1.53 1.03 4.12 3.74 3.96

The population detected after growing (post-harvest sample) can be analysed as a standalone dataset or interpreted as a ratio between the initial population and the population after harvest (the Pi/Pf ratio) (Table 6).

Pf values for the highly resistant varieties (Elland, Innovator, Eurostar, Buster, Amanda, and Karelia) did not differ significantly from one another and ranged from 0.9 to 11.9 eggs per gram. This can be compared with a Pi of 31.5 eggs per gram (Figure 3). The partially resistant variety Cinderella (resistance score of 6) can also be included, statistically, in this group. However, the Pf was 68 eggs per gram representing an apparent increase from the Pi value.

Maris Peer, Lanorma, and Tyson (resistance scores of 2, 5, and 4 respectively) can be grouped together and all had significantly higher Pf values than the former group of resistant varieties with Pf values ranging from 290 - 309 eggs per gram. The Pf value for Cara, a highly susceptible and tolerant variety, was significantly higher than all other varieties in this trial at 500 eggs per gram.

There was no significant effect of Nemathorin on the Pf values either overall or for different individual varieties (with the single exception of Maris Peer).

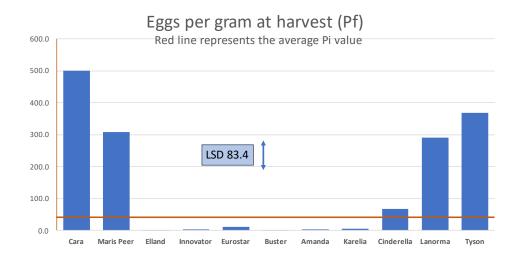


Figure 3: Pf (eggs per gram) values for all varieties (average of treated and untreated plots). Orange bar – average number of eggs per gram of soil. LSD – least significant difference.

Yield and tuber numbers

Tables 7a and 7b give the total yield (tonnes per ha) and yield in 5mm size fractions. The total yield data is summarised in Figure 4. The variety maturity characteristics differ, and this has affected the yield potential. For example, Cara, a late maincrop variety, yielded only 37.4 t/ha (treated). However earlier varieties (e.g., Maris Peer (Second early) and Lanorma (early Maincrop)) produced greater (treated) yields (53.4 t/ha and 67.1 t/ha respectively). With a longer growing season and appropriate fertiliser applications the yield of later maturing varieties could have been expected to increase.

The main interest in these results lies in the differences between the yield of untreated and treated plots as this provides a measure of the tolerance to PCN (Figure 4).

Table 7a: Total yield (in tonnes per ha) and yield in size fractions between 25mm and 55mm

	Yield		Yield	1	Yield		Yield	ı İ	Yield	1	Yield	1	Yield	1	Yield	d
Treatment	Tota		<25m		25-30n		30-35n		35-40r		40-45n		45-50n		50-55n	
Troutmont	T/Ha		T/Ha		T/Ha		T/Ha		T/Ha		T/Ha		T/Ha		T/Ha	
Cara	36.99	f	0.09	abc	0.17	bc	0.68	b	1.39	bc	2.82	b	4.25	С	6.02	b
Maris Peer	46.20	de	0.11	а	0.46	a	1.14	а	2.17	a	4.02	а	7.15	а	8.13	a
Elland	52.11	bc	0.06	cde	0.40	bc	0.35	cde	0.77	def	1.32	def	2.50	d	3.21	cd
Innovator	50.23	cd	0.02	ef	0.10	bcd	0.17	def	0.35	fg	0.59	fg	1.03	ef	2.50	de
Eurostar	43.55	e	0.01	f	0.06	cd	0.09	ef	0.19	g	0.60	efg	1.08	ef	2.44	de
Buster	52.72	bc	0.01	f	0.06	cd	0.16	def	0.38	fg	0.62	efg	1.20	ef	1.41	e
Amanda	56.36	b	0.07	a-d	0.20	b	0.52	bc	1.20	bcd	2.67	bc	5.81	b	8.64	a
Karelia	63.04	а	0.01	f	0.03	d	0.07	f	0.16	g	0.28	g	0.82	f	2.51	de
Cinderella	44.45	e	0.06	b-e	0.18	bc	0.53	bc	1.69	ab	3.12	b	6.47	ab	9.35	a
Lanorma	65.31	а	0.06	b-e	0.20	b	0.40	bcd	0.60	efg	1.47	d	2.21	de	3.50	cd
Tyson	54.00	bc	0.10	ab	0.19	b	0.49	bc	1.13	cde	1.86	cd	3.08	cd	6.15	b
Tyson	34.00	DC	0.10	ab	0.15		0.40	DC	1.10	cac	1.00	cu	5.00	cu	0.10	
LSD P=.05		5.27		0.04		0.12		0.28		0.55		0.83		1.24		1.35
Standard Deviation		5.28		0.04		0.12		0.28		0.55		0.83		1.24		1.36
CV		10.21		82.30		74.21		69.97		61.46		47.89		39.08		28.15
				02.00		7 4.21		00.01		01.10		11.00		00.00		20.10
Yield by Treatment																
	Yield		Yield	1	Yield		Yield		Yield		Yield	1	Yield		Yield	d
Treatment	Tota		<25m		25-30n		30-35n		35-40r		40-45n		45-50n		50-55n	
	T/Ha		T/Ha		T/Ha		T/Ha		T/Ha		T/Ha		T/Ha		T/Ha	
Untreated	47.87	b	0.07	а	0.17	а	0.47	а	0.96	а	2.02	а	3.49	а	4.71	а
30kg/ha Nemathorin	55.55	а	0.04	b	0.16	а	0.34	b	0.82	а	1.44	b	2.86	b	4.94	а
oong na momanom.			0.0 .	-	00		0.0.		0.02				2.00	-		_ u
LSD P=.05		2.15		0.02		0.05		0.12		0.22		0.34		0.51		0.55
Standard Deviation		5.28		0.04		0.12		0.28		0.55		0.83		1.24		1.36
Claridar a Doridaron				0.0.		V										
CV		10.21		82.30		74.21		69.97		61.46		47.89		39.08		28.15
CV		10.21		82.30		74.21		69.97		61.46		47.89		39.08		28.15
		10.21		82.30		74.21		69.97		61.46		47.89		39.08		28.15
CV <u>Yield by Variety and Trea</u>			Yield		Yield		Yield		Yield		Yield		Yield		Yield	
	atment_			ı		ı	Yield	ı		ı	Yield	ı	Yield 45-50n	l		d
Yield by Variety and Trea	atment Yield		Yield	i m	Yield	l nm		l nm	Yield	i nm		d nm		l nm	Yield	d nm
Yield by Variety and Trea	atment Yield Tota		Yield	i m	Yield 25-30n	l nm	30-35n	l nm	Yield 35-40r	i nm	40-45n	d nm	45-50n	l nm	Yield 50-55n	d nm
Yield by Variety and Treatment	atment Yield Total		Yield <25m T/Ha	d m	Yield 25-30n T/Ha	I nm l b-g	30-35n T/Ha	i nm	Yield 35-40r T/Ha	i nm	40-45n T/Ha	i nm	45-50n T/Ha	l nm	Yield 50-55n T/Ha	d nm
Yield by Variety and Treatment Cara Untreated	atment Yield Tota T/Ha 36.56	k	Yield <25m T/Ha	m a	Yield 25-30n T/Ha 0.18	l nm	30-35 n T/Ha 0.69	i nm i b	Yield 35-40r T/Ha 1.45	i nm a bc	40-45 n T/Ha 3.23	nm a bc	45-50 n T/Ha 4.88	I mm	Yield 50-55n T/Ha	d nm a
Yield by Variety and Treatment Cara Untreated Cara Treated Maris Peer Untreated	Atment Yield Total T/Ha 36.56 37.43	k k	Yield <25m T/Ha 0.11 0.06	m ab b-f	Yield 25-30n T/Ha 0.18 0.15	l nm l b-g b-g	30-35n T/Ha 0.69 0.67	l b b	Yield 35-40r T/Ha 1.45 1.33	inm a bc b-e	40-45 n T/Ha 3.23 2.40	hnm bc cde	45-50 n T/Ha 4.88 3.63	I mm cde efg	Yield 50-55n T/Ha 6.66 5.39	d mm a cde efg a-c
Yield by Variety and Treatment Cara Untreated Cara Treated	atment Yield Total T/Ha 36.56 37.43 38.98	k k	Yield <25m T/Ha 0.11 0.06 0.17	m ab b-f	Yield 25-30n T/Ha 0.18 0.15 0.70	l hm b-g b-g a	30-35n T/Ha 0.69 0.67 1.79	I hm b b a	Yield 35-40r T/Ha 1.45 1.33 2.95	hmm bc b-e a	40-45 n T/Ha 3.23 2.40 4.84	hmm h bc cde a	45-50n T/Ha 4.88 3.63 8.29	i cde efg	Yield 50-55n T/Ha 6.66 5.39 8.12	d mm a cde efg a-c abo
Yield by Variety and Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated	atment Yield Total T/Ha 36.56 37.43 38.98 53.42	k k jk e-h	Yield <25m T/Ha 0.11 0.06 0.17 0.05	ab b-f a c-f	Yield 25-30n T/Ha 0.18 0.15 0.70 0.22	b-g b-g b-d a	30-35n T/Ha 0.69 0.67 1.79 0.50	b b b	Yield 35-40r T/Ha 1.45 1.33 2.95 1.39	bc b-e a bcd	3.23 2.40 4.84 3.21	bc cde a bc	45-50n T/Ha 4.88 3.63 8.29 6.01	cde efg a bc	Yield 50-55n T/Ha 6.66 5.39 8.12 8.15	d mm a cde efg a-c abc h-l
Yield by Variety and Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated	atment Yield Total T/Ha 36.56 37.43 38.98 53.42 50.08	k k jk e-h	Yield <25m T/Ha 0.11 0.06 0.17 0.05 0.06	m ab b-f a c-f b-e	Yield 25-30n T/Ha 0.18 0.15 0.70 0.22 0.12	b-g b-g a bcd b-g	30-35n T/Ha 0.69 0.67 1.79 0.50 0.31	hmm b b b a b-e b-f	Yield 35-40r T/Ha 1.45 1.33 2.95 1.39 0.73	hnm bc b-e a bcd c-g	40-45n T/Ha 3.23 2.40 4.84 3.21 1.27	hmm bc cde a bc e-k	45-50n T/Ha 4.88 3.63 8.29 6.01 2.69	cde efg a bc f-i	Yield 50-55n T/Ha 6.66 5.39 8.12 8.15 2.70	d mm a cde efg a-c abc h-l
Yield by Variety and Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Untreated Innovator Untreated	36.56 37.43 38.98 53.42 50.08 54.14	k k jk e-h ghi e-h	Yield <25m T/Ha 0.11 0.06 0.17 0.05 0.06 0.06	m ab b-f a c-f b-e b-f	Yield 25-30n T/Ha 0.18 0.15 0.70 0.22 0.12 0.18	b-g b-g b-d bcd b-g b-g	30-35n T/Ha 0.69 0.67 1.79 0.50 0.31 0.40	l b b a b-e b-f b-f	Yield 35-40r T/Ha 1.45 1.33 2.95 1.39 0.73 0.80	hnm bc b-e a bcd c-g c-g	40-45n T/Ha 3.23 2.40 4.84 3.21 1.27 1.37	hnm bc cde a bc e-k e-j	45-50n T/Ha 4.88 3.63 8.29 6.01 2.69 2.32	cde efg a bc f-i f-j	Yield 50-55n T/Ha 6.66 5.39 8.12 8.15 2.70 3.72	d mm a cde efg a-c abc h-l g-j
Yield by Variety and Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated	36.56 37.43 38.98 53.42 50.08 54.14 47.52	k k jk e-h ghi e-h	Yield <25m T/Ha 0.11 0.06 0.17 0.05 0.06 0.06 0.03	ab b-f a c-f b-e b-f def	Yield 25-30n T/Ha 0.18 0.15 0.70 0.22 0.12 0.18 0.05	b-g b-g b-d bcd b-g b-g	30-35n T/Ha 0.69 0.67 1.79 0.50 0.31 0.40 0.10	b b a a b-e b-f b-f ef	Yield 35-40r T/Ha 1.45 1.33 2.95 1.39 0.73 0.80 0.22	bc b-e a bcd c-g c-g g fg	40-45n T/Ha 3.23 2.40 4.84 3.21 1.27 1.37 0.57	hmm bc cde a bc e-k e-j ijk	45-50n T/Ha 4.88 3.63 8.29 6.01 2.69 2.32 0.99	cde efg a bc f-i f-j	Yield 50-55n T/Ha 6.66 5.39 8.12 8.15 2.70 3.72 1.50	d cde a cde a cde abc abc h-l g-j kl
Yield by Variety and Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated Innovator Treated	ximent Yield Total T/Ha 36.56 37.43 38.98 53.42 50.08 54.14 47.52 52.93	k k jk e-h ghi e-h hi e-i	Yield <25m T/Ha 0.11 0.06 0.17 0.05 0.06 0.06 0.03 0.02	ab b-f a c-f b-e b-f def def	Yield 25-30n T/Ha 0.18 0.15 0.70 0.22 0.12 0.18 0.05 0.16	b-g b-g b-d b-d b-g b-g d-g b-g c-g	30-35n T/Ha 0.69 0.67 1.79 0.50 0.31 0.40 0.10 0.25	hmm b b a b-e b-f b-f ef	Yield 35-40r T/Ha 1.45 1.33 2.95 1.39 0.73 0.80 0.22 0.48	bc b-e a bcd c-g c-g g fg g	3.23 2.40 4.84 3.21 1.27 1.37 0.57 0.61	bc cde a bc e-k e-j ijk ijk	45-50n T/Ha 4.88 3.63 8.29 6.01 2.69 2.32 0.99 1.08	cde efg a bc f-i f-j ij	Yield 50-55n T/Ha 6.66 5.39 8.12 8.15 2.70 3.72 1.50 3.51	d mm a cde efg a-c abc h-l g-j kl g-j h-l
Yield by Variety and Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated Innovator Treated Eurostar Untreated	ximent Yield Total T/Ha 36.56 37.43 38.98 53.42 50.08 54.14 47.52 52.93 38.35	k k jk e-h ghi e-h hi e-i	Yield <25m T/Hz 0.11 0.06 0.17 0.05 0.06 0.06 0.03 0.02 0.00	ab b-f a c-f b-e b-f def def f	Yield 25-30n T/Hz 0.18 0.15 0.70 0.22 0.12 0.18 0.05 0.16	b-g b-g a bcd b-g b-g d-g b-g	30-35n T/Ha 0.69 0.67 1.79 0.50 0.31 0.40 0.10 0.25 0.11	b b a a b-e b-f b-f ef c-f def	Yield 35-40r T/Hz 1.45 1.33 2.95 1.39 0.73 0.80 0.22 0.48 0.23	bc b-e a bcd c-g c-g g fg	3.23 2.40 4.84 3.21 1.27 1.37 0.57 0.61 0.77	bc cde a bc e-k e-j ijk ijk h-k	45-50n T/Ha 4.88 3.63 8.29 6.01 2.69 2.32 0.99 1.08 1.17	cde efg a bc f-i f-j ij ij hij	Yield 50-55n T/Hz 6.66 5.39 8.12 8.15 2.70 3.72 1.50 3.51 2.56	d mm a cde efg a-c abc h-l g-j kl g-j h-l
Yield by Variety and Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Untreated Innovator Untreated Innovator Untreated Eurostar Untreated Eurostar Untreated Eurostar Treated Eurostar Treated	Atment Yield Total T/Ha 36.56 37.43 38.98 53.42 50.08 54.14 47.52 52.93 38.35 48.75	k k jk e-h ghi e-h hi e-i k	Yield <25m T/Hz 0.11 0.06 0.17 0.05 0.06 0.03 0.02 0.00 0.01	ab b-f a c-f b-e b-f def f ef	Yield 25-30n T/Hz 0.18 0.15 0.70 0.22 0.12 0.18 0.05 0.16 0.08	b-g b-g b-g b-g b-g b-g b-g b-g b-g c-g d-g b-g	30-35n T/Ha 0.69 0.67 1.79 0.50 0.31 0.40 0.10 0.25 0.11 0.07	b b a b-e b-f b-f ef c-f def f	Yield 35-40r T/Hz 1.45 1.33 2.95 1.39 0.73 0.80 0.22 0.48 0.23 0.14	bc b-e a bcd c-g c-g g fg g g fg	40-45n T/Ha 3.23 2.40 4.84 3.21 1.27 1.37 0.57 0.61 0.77 0.44	hom bc cde a bc e-k e-j ijk ijk h-k	45-50n T/Ha 4.88 3.63 8.29 6.01 2.69 2.32 0.99 1.08 1.17 0.99	cde efg a bc f-i f-j ij hij	Yield 50-55n T/Ha 6.66 5.39 8.12 8.15 2.70 3.72 1.50 3.51 2.56 2.31	d mm a cde efg a-c abc h-l g-j kl g-j h-l
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Untreated Maris Peer Treated Elland Treated Innovator Untreated Innovator Untreated Eurostar Untreated Eurostar Untreated Eurostar Treated Buster Untreated	atment Yield Total T/Ha 36.56 37.43 38.98 53.42 50.08 54.14 47.52 52.93 38.35 48.75 45.94	k k jk e-h ghi e-h hi e-i k ghi ij b-e	Yield <25m T/Ha 0.11 0.06 0.17 0.05 0.06 0.06 0.03 0.02 0.00 0.01	a ab b-f a c-f b-e b-f def def f ef def	Yield 25-30n T/Ha 0.18 0.15 0.70 0.22 0.12 0.18 0.05 0.16 0.08 0.05	b-g b-g a b-g b-g d-g b-g d-g b-g c-g d-g b-g	30-35n T/Ha 0.69 0.67 1.79 0.50 0.31 0.40 0.10 0.25 0.11 0.07	b b a b-e b-f b-f ef c-f def f c-f	Yield 35-40r T/Ha 1.45 1.33 2.95 1.39 0.73 0.80 0.22 0.48 0.23 0.14	bc b-e a bcd c-g c-g g fg g g	40-45n T/Ha 3.23 2.40 4.84 3.21 1.27 1.37 0.57 0.61 0.77 0.44 0.69	hom bc cde a bc e-k e-j ijk ijk h-k	4.88 3.63 8.29 6.01 2.69 2.32 0.99 1.08 1.17 0.99	cde efg a bc f-i f-j ij hij ij	Yiek 50-55n T/Ha 6.66 5.39 8.12 8.15 2.70 3.72 1.50 3.51 2.56 2.31 1.92	dd mmm a cde efg a-cc abcc h-l g-j h-l h-l jkl
Yield by Variety and Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated Eurostar Untreated Eurostar Untreated Buster Untreated Buster Untreated Buster Treated Buster Treated	36.56 37.43 38.98 53.42 50.08 54.14 47.52 52.93 38.35 48.75 45.94 59.50	k k jk e-h ghi e-h hi e-i k ghi ij	Yield <25m T/Ha 0.11 0.06 0.17 0.05 0.06 0.06 0.03 0.02 0.00 0.01 0.03 0.00	a ab b-f a c-f b-e b-f def def f ef def f	Yield 25-30n T/Ha 0.18 0.15 0.70 0.22 0.12 0.18 0.05 0.06 0.08 0.05 0.09	b-g b-g b-g b-g b-g b-g b-g b-g c-g b-g b-g b-g b-g b-g b-g b-g b-g b-g b	30-35n T/Ha 0.69 0.67 1.79 0.50 0.31 0.40 0.10 0.25 0.11 0.07 0.19	homm b b b a b-e b-f ef c-f def f c-f def	Yield 35-40r T/Ha 1.45 1.33 2.95 1.39 0.73 0.80 0.22 0.48 0.23 0.14 0.45	bc b-e a bcd c-g c-g g fg g g g g g	40-45n T/Ha 3.23 2.40 4.84 3.21 1.27 1.37 0.57 0.61 0.77 0.44 0.69 0.55	hom bc cde a bc e-k e-j ijk h-k jk h-k ijk	4.88 3.63 8.29 6.01 2.69 2.32 0.99 1.08 1.17 0.99 1.71	cde efg a bc f-j ij hij ij hij j	Yiek 50-55n T/Ha 6.66 5.39 8.12 8.15 2.70 3.72 1.50 3.51 2.56 2.31 1.92 0.89	dd mmm a cdefg a-cc abco h-l g-j h-l h-l jkl l bcc
Yield by Variety and Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Untreated Innovator Untreated Innovator Treated Eurostar Untreated Buster Untreated Buster Treated Buster Treated Buster Treated Amanda Untreated	36.56 37.43 38.98 53.42 50.08 54.14 47.52 52.93 38.35 48.75 45.94 59.50 50.16	k k jk e-h ghi e-h hi e-i k ghi ij b-e ghi	Yield <25m T/He 0.11 0.06 0.17 0.05 0.06 0.03 0.02 0.00 0.01 0.03 0.02 0.00 0.01	ab b-f a c-f b-e b-f def f ef def f b-f	Yield 25-30n T/Hz 0.18 0.15 0.70 0.22 0.12 0.18 0.05 0.16 0.08 0.05 0.09 0.03	b-g b-g b-g b-g b-g b-g b-g c-g b-g b-g b-g b-g b-g b-g b-g b-g b-g b	30-35n T/Ha 0.69 0.67 1.79 0.50 0.31 0.40 0.10 0.25 0.11 0.07 0.19 0.14 0.70	homm b b b a b-e b-f b-f c-f def f c-f def b b b	Yield 35-40r T/Ha 1.45 1.33 2.95 1.39 0.73 0.80 0.22 0.48 0.23 0.14 0.45 0.30 1.18	hom be be a bed c-g c-g g fg g g g g b-f b-f	40-45n T/Ha 3.23 2.40 4.84 3.21 1.27 1.37 0.57 0.61 0.77 0.44 0.69 0.55 2.91	hnm bc cde a bc e-k e-j ijk h-k jk h-k jk bcd	4.88 3.63 8.29 6.01 2.69 2.32 0.99 1.08 1.17 0.99 1.71 0.69 5.50	cde efg a bc f-i f-j ij hij ij hij j cd	Yield 50-55n T/He 6.66 5.39 8.12 8.15 2.70 3.72 1.50 3.51 2.56 2.31 1.92 0.89 8.07	dd mmm a cde efg a-cc abcc b-l g-j kl g-j kl jkl l bcc abc
Yield by Variety and Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Treated Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated Eurostar Treated Buster Untreated Buster Treated Buster Treated Amanda Untreated Amanda Untreated	Atment Yield Total 36.56 37.43 38.98 53.42 50.08 54.14 47.52 52.93 38.35 48.75 45.94 59.50 50.16 62.57	k k k jk e-h ghi e-h hi e-i k ghi ij b-e ghi a-d	Yield <25m T/He 0.11 0.06 0.17 0.05 0.06 0.03 0.02 0.00 0.01 0.03 0.00 0.01 0.03	a ab b-f a c-f b-e b-f def f def f b-f bcd	Yield 25-30n T/He 0.18 0.15 0.70 0.22 0.12 0.18 0.05 0.16 0.08 0.05 0.09 0.03 0.14	b-g b-g b-g b-g b-g b-g b-g b-g d-g b-g b-g b-g b-g b-g b-g b-g b-g b-g b	30-35n T/Ha 0.69 0.67 1.79 0.50 0.31 0.40 0.10 0.25 0.11 0.07 0.19 0.14 0.70 0.35	b b a a b-e b-f b-f ef c-f def b b-f	Yield 35-40r T/H: 1.45 1.33 2.95 1.39 0.73 0.80 0.22 0.48 0.23 0.14 0.45 0.30 1.18	bce a bcd c-g c-g g fg g g fg g g b-f b-f g	40-45n T/Ha 3.23 2.40 4.84 3.21 1.27 1.37 0.57 0.61 0.77 0.44 0.69 0.55 2.91 2.43	bc cde a bc e-k e-j ijk ijk h-k ijk bcd cde	4.88 3.63 8.29 6.01 2.69 2.32 0.99 1.08 1.17 0.99 1.71 0.69 5.50 6.11	cde efg a bc f-i f-j ij hij ij hij j cd bc ij	Yiek 50-55n T/Ha 6.66 5.39 8.12 8.15 2.70 3.72 1.50 3.51 2.56 2.31 1.92 0.89 8.07 9.22 2.94	d mm a cde efg a-c abc h-l g-j kl g-j h-l jkl
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Untreated Maris Peer Treated Maris Peer Treated Elland Treated Innovator Untreated Innovator Untreated Eurostar Untreated Eurostar Untreated Eurostar Treated Buster Untreated Buster Untreated Amanda Untreated Amanda Untreated Karelia Untreated Karelia Untreated Karelia Untreated	Atment Yield Total T/Ha 36.56 37.43 38.98 53.42 50.08 54.14 47.52 52.93 38.35 48.75 45.94 59.50 60.16 62.57 60.05	k k jk e-h ghi e-i k ghi ij b-e ghi a-d a-e	Yiek <25m T/He 0.11 0.06 0.17 0.05 0.06 0.03 0.02 0.00 0.01 0.03 0.00 0.01 0.03 0.00 0.01 0.03	ab b-f a c-f b-e b-f def f ef def f b-f bcd ef	Yield 25-30n T/Ha 0.18 0.15 0.70 0.22 0.12 0.18 0.05 0.06 0.08 0.05 0.09 0.03 0.14 0.26	b-g	30-35n T/Ha 0.69 0.67 1.79 0.50 0.31 0.40 0.10 0.25 0.11 0.07 0.19 0.14 0.70 0.35 0.06	b b b a b-e b-f b-f def f b b-f f	Yield 35-40r T/Ha 1.45 1.33 2.95 1.39 0.73 0.80 0.22 0.48 0.23 0.14 0.45 0.30 1.18 1.22	hom be be a bed c-g c-g g fg g g g g b-f b-f	40-45n T/Ha 3.23 2.40 4.84 3.21 1.27 1.37 0.57 0.61 0.77 0.44 0.69 0.55 2.91 2.43	bc cde a bc e-k e-j ijk ijk h-k jk bcd cde	4.88 3.63 6.01 2.69 2.32 0.99 1.08 1.17 0.99 1.71 0.69 5.50 6.11	cde efg a bc f-i f-j ij hij ij hij j cd bc	Yield 50-55n T/He 6.66 5.39 8.12 8.15 2.70 3.72 1.50 3.51 2.56 2.31 1.92 0.89 8.07 9.22	dispersion of the control of the con
Yield by Variety and Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Untreated Elland Untreated Elland Treated Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated Buster Untreated Buster Untreated Amanda Untreated Amanda Untreated Amanda Treated Karelia Untreated	atment Yield Total T/Ha 36.56 37.43 38.98 53.42 50.08 54.14 47.52 52.93 38.35 48.75 45.94 59.50 50.16 62.57 60.05 66.04	k k jk e-h ghi e-i k ghi ij b-e ghi a-d a-e	Yield <25m T/Hz 0.11 0.06 0.17 0.05 0.06 0.03 0.02 0.00 0.01 0.03 0.00 0.01 0.03 0.00 0.00	ab b-f a c-f b-e b-f def f ef def f b-def def f b-def def f b-f bcd ef def	Yield 25-30n T/Hz 0.18 0.15 0.70 0.22 0.12 0.18 0.05 0.16 0.08 0.05 0.09 0.03 0.14 0.26 0.04	b-g	30-35n T/Ha 0.69 0.67 1.79 0.50 0.31 0.40 0.10 0.25 0.11 0.07 0.19 0.14 0.70 0.35 0.06 0.08	b b b a b-e b-f b-f def b b-f f f	Yield 35-40r T/Hz 1.45 1.33 2.95 1.39 0.73 0.80 0.22 0.48 0.23 0.14 0.45 0.30 1.18 1.22 0.21	bc b-e a bcd c-g c-g g fg g g b-f b-f g g	40-45n T/Ha 3.23 2.40 4.84 3.21 1.27 1.37 0.57 0.61 0.77 0.44 0.69 0.55 2.91 2.43 0.41 0.15	bc cde a bc e-k e-j ijk h-k jk h-k ijk bcd cde jk k	4.88 3.63 8.29 6.01 2.69 2.32 0.99 1.08 1.17 0.99 1.71 0.69 5.50 6.11 1.04 0.61	cde efg a bc f-i f-j ij hij ij hij j cd bc	Yield 50-55n T/Hz 6.66 5.39 8.12 8.15 2.70 3.72 1.50 3.51 2.56 2.31 1.92 0.89 8.07 9.22 2.94 2.08	dd mmm a cde efg a-cc abcc b-l g-j kl g-j kl l bcc abc b-k-l h-l jkl l bcc abc b-k-k-l
Yield by Variety and Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Untreated Elland Untreated Elland Untreated Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Untreated Buster Untreated Buster Untreated Amanda Untreated Amanda Untreated Amanda Untreated Karelia Untreated Karelia Untreated Karelia Untreated Cinderella Untreated	36.56 37.43 38.98 53.42 50.08 54.14 47.52 52.93 38.35 48.75 45.94 59.50 50.16 62.57 60.05 66.04 38.02	k k jk e-h ghi e-h hi e-i k ghi ij b-e ghi a-d a-e ab k	Yield <25m T/Hz 0.11 0.06 0.17 0.05 0.06 0.03 0.02 0.00 0.01 0.03 0.00 0.06 0.08 0.01 0.02 0.00 0.08 0.01 0.02 0.00	ab b-f a c-f b-e b-f def f def f b-f bcd ef def bcd	Yield 25-30n 7/Hz 0.18 0.15 0.70 0.22 0.12 0.18 0.05 0.16 0.08 0.05 0.09 0.03 0.14 0.26 0.04	b-g	30-35n T/Ha 0.69 0.67 1.79 0.50 0.31 0.40 0.10 0.25 0.11 0.07 0.19 0.14 0.70 0.35 0.06 0.08 0.51	b b b a a b-e b-f b-f def b b-f f f bcd	Yield 35-40r T/Hz 1.45 1.33 2.95 1.39 0.73 0.80 0.22 0.48 0.23 0.14 0.45 0.30 1.18 1.22 0.21 1.69	bc b-e a bcd c-g c-g g fg g g b-f b-f g g b b	40-45n T/Ha 3.23 2.40 4.84 3.21 1.27 1.37 0.57 0.61 0.77 0.44 0.69 0.55 2.91 2.43 0.41 0.15 3.91	bc cde a bc e-k e-j ijk ijk h-k ijk bcd cde jk ab	4.88 3.63 8.29 6.01 2.69 2.32 0.99 1.08 1.17 0.69 5.50 6.11 1.04 0.61 7.34	l Cde efg a bc f-i j ij hij j cd bc ij j ab bcd	Yield 50-55n T/Hz 6.66 5.39 8.12 8.15 2.70 3.72 1.50 3.51 2.56 2.31 1.92 0.89 8.07 9.22 2.94 8.67	dispersion of the control of the con
Yield by Variety and Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Treated Elland Untreated Elland Untreated Innovator Untreated Innovator Untreated Eurostar Untreated Buster Untreated Buster Treated Buster Treated Amanda Untreated Amanda Treated Karelia Untreated Karelia Untreated Cinderella Untreated	36.56 37.43 38.98 53.42 50.08 54.14 47.52 52.93 38.35 48.75 45.94 59.50 50.16 62.57 60.05 66.04 38.02 50.89	k k k jk e-h ghi e-i k ghi ij b-e ghi a-d a-d a-d a-d k	Yield <25m T/Hz 0.11 0.06 0.17 0.05 0.06 0.03 0.02 0.00 0.01 0.03 0.00 0.06 0.08 0.01 0.02 0.09 0.04	ab b-f a c-f b-e b-f def f b-f bcd ef f bcd cef bc c-f	Yield 25-30n T/Hz 0.18 0.15 0.70 0.22 0.12 0.18 0.05 0.16 0.08 0.05 0.09 0.03 0.14 0.26 0.04 0.01 0.13	b-g b-g a b-d b-g b-g d-g b-g d-g b-g b-g b-g b-g b-g b-g b-g b-g b-g b	30-35n T/Ha 0.69 0.67 1.79 0.50 0.31 0.40 0.10 0.25 0.11 0.07 0.19 0.14 0.70 0.35 0.06 0.08 0.51 0.55	b b a a b-e b-f ef c-f def b b-f f f bcd bc	Yield 35-40r T/H: 1.45 1.33 2.95 1.39 0.73 0.80 0.22 0.48 0.23 0.14 0.45 0.30 1.18 1.22 0.21 0.11 1.69	bc bc bc a bcd cc-g g fg g g bc-f bc-f g g b bc-f bc-f g b b b dc-g	40-45n T/Ha 3.23 2.40 4.84 3.21 1.27 1.37 0.57 0.61 0.71 0.44 0.69 0.55 2.91 2.43 0.41 0.15 3.91 2.33	bc cde a bc e-b ijk ijk h-k jjk bcd cde jk k ab c-f d-h	4.88 3.63 8.29 6.01 2.69 2.32 0.99 1.08 1.17 0.69 5.50 6.11 1.04 0.61 7.34 5.61	l Cde efg a bc f-i ij ij hiji j cd bc ij j ab bcd g-j	Yield 50-55n T/Hz 6.66 5.39 8.12 8.15 2.70 3.72 1.50 3.51 2.56 2.31 1.92 0.89 8.07 9.22 2.94 2.98 8.67 10.02	dispersion of the control of the con
Yield by Variety and Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Untreated Elland Untreated Elland Untreated Innovator Untreated Innovator Untreated Eurostar Untreated Eurostar Untreated Buster Untreated Buster Treated Amanda Untreated Amanda Untreated Amanda Untreated Cinderella Untreated Cinderella Untreated Cinderella Untreated Lanorma Untreated	ximent Yield Total 36.56 37.43 38.98 53.42 50.08 54.14 47.52 52.93 38.35 48.75 45.94 59.50 60.05 66.04 38.02 50.89 63.56	k k k jk e-h ghi e-i k ghi ij b-e ghi a-d a-e ab k f-i abc a	Yield <25m T/He 0.11 0.06 0.17 0.05 0.06 0.03 0.02 0.00 0.01 0.03 0.00 0.01 0.03 0.00 0.06 0.08 0.01 0.09 0.04 0.06	ab b-f a c-f b-f def f b-f bcd ef def def cf bcd cf bcd cf bcd bc c-f b-f	Yield 25-30n T/Hz 0.18 0.15 0.70 0.22 0.12 0.18 0.05 0.16 0.08 0.05 0.09 0.03 0.14 0.26 0.04 0.01 0.13 0.23	b-g b-g b-g b-g b-g b-g b-g d-g b-g c-g d-g b-g b-g b-g b-g b-g b-g b-g b-g b-g b	30-35n T/Ha 0.69 0.67 1.79 0.50 0.31 0.40 0.10 0.25 0.11 0.07 0.19 0.14 0.70 0.35 0.06 0.08 0.51 0.55 0.32	b b a a b-e b-f def f f b bcd bc b-f	Yield 35-40r T/H: 1.45 1.33 2.95 1.39 0.73 0.80 0.22 0.48 0.23 0.14 0.45 0.30 1.18 1.22 0.21 0.11 1.69 1.69	bc bc-e a bcd cc-g cc-g g g g bc-f bc-f g b b b	40-45n T/Ha 3.23 2.40 4.84 3.21 1.27 1.37 0.57 0.61 0.77 0.44 0.69 0.55 2.91 2.43 0.41 0.15 3.91 2.33 1.78	bc cde a bc e-b ijk ijk h-k jk bcd cde jk k ab c-f d-h g-k	4.550n T/He 4.88 3.63 8.29 6.01 2.69 2.32 0.99 1.08 1.17 0.99 1.71 0.69 5.50 6.11 1.04 0.61 7.34 5.61 2.15	l Cde efg a bc f-i j ij hij j cd bc ij j ab bcd	Yield 50-55n T/He 6.66 5.39 8.12 8.15 2.70 3.72 1.50 3.51 2.56 2.31 1.92 0.89 8.07 9.22 2.94 2.08 8.67 10.02 3.46	dispersion of the control of the con
Yield by Variety and Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Untreated Elland Untreated Elland Treated Innovator Untreated Innovator Untreated Eurostar Untreated Eurostar Treated Eurostar Treated Buster Untreated Buster Untreated Amanda Untreated Amanda Untreated Karelia Untreated Karelia Untreated Cinderella Untreated Cinderella Untreated Lanorma Untreated Lanorma Untreated Lanorma Untreated	Atment Yield Total 36.56 37.43 38.98 53.42 50.08 54.14 47.52 52.93 38.35 48.75 45.94 59.50 66.04 38.02 50.89 63.56 67.06	k k k jk e-h ghi e-i k ghi ij b-e ghi a-d a-e ab k f-i	Yiek <25m T/He 0.11 0.06 0.17 0.05 0.06 0.03 0.02 0.00 0.01 0.03 0.00 0.06 0.08 0.01 0.02 0.09 0.01 0.02 0.09 0.01 0.00	ab b-f a c-f b-f def f f b-f bcd ef def bcc c-f b-c bcc c-f b-f b-e	Yield 25-30n T/He 0.18 0.15 0.70 0.22 0.12 0.18 0.05 0.06 0.09 0.03 0.14 0.26 0.04 0.01 0.13 0.22 0.12	b-g b-g b-g b-g b-g b-g b-g d-g b-g d-g b-g b-g d-g b-g c-g d-g b-g b-g b-g b-g b-g b-g b-g b-g b-g b	30-35n T/Ha 0.69 0.67 1.79 0.50 0.31 0.40 0.10 0.25 0.11 0.07 0.19 0.14 0.70 0.35 0.06 0.08 0.51 0.55 0.32 0.49	b b a b-e b-f c-f def b b-f f f bcd bc b-f b-e	Yield 35-40r T/H: 1.45 1.33 2.95 1.39 0.73 0.80 0.22 0.48 0.23 0.14 0.45 0.30 1.18 1.22 0.21 0.11 1.69 0.63 0.56	bc bc-e a bcd c-g g fg g g b-f b-f g g b b d-g efg	40-45n T/Ha 3.23 2.40 4.84 3.21 1.27 1.37 0.57 0.61 0.77 0.44 0.69 0.55 2.91 2.43 0.41 0.15 3.91 2.33 1.78 1.16	bc cde a bc e-b ijk ijk h-k ijk bcd cde jk k ab c-f d-h	4.88 3.63 8.29 6.01 2.69 2.32 0.99 1.08 1.17 0.99 1.71 0.69 5.50 6.11 1.04 0.61 7.34 5.61 2.15	cde efg a bc f-i f-j ij hij j cd bc ij j ab bcd g-j def	Yield 50-55n T/He 6.66 5.39 8.12 8.15 2.70 3.72 1.50 3.51 2.56 2.31 1.92 0.89 8.07 9.22 2.94 2.08 8.67 1.00 2.08 8.07 9.22 2.94 2.08 8.07 9.22 2.94 2.08 8.07 9.22 2.94 2.08 8.0	dispersion of the control of the con
Yield by Variety and Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Untreated Maris Peer Treated Elland Treated Innovator Untreated Innovator Untreated Eurostar Untreated Eurostar Untreated Buster Untreated Buster Untreated Buster Untreated Amanda Untreated Karelia Untreated Karelia Untreated Karelia Treated Cinderella Treated Lanorma Untreated Lanorma Untreated Lanorma Untreated Lanorma Untreated Lanorma Treated Tyson Untreated	atment Yield Total T/Ha 36.56 37.43 38.98 53.42 50.08 54.14 47.52 52.93 38.35 48.75 45.94 59.50 50.16 62.57 60.05 66.04 38.02 50.89 63.56 67.06 49.92	k k k jk e-h ghi e-i k ghi ij b-e ab k f-i a-d a-e ab k f-i a-d a-e	Yield <25m T/Hz 0.11 0.06 0.17 0.05 0.06 0.03 0.02 0.00 0.01 0.03 0.00 0.06 0.08 0.01 0.02 0.00 0.00 0.06 0.08 0.01 0.02 0.00 0.01 0.02 0.09 0.04 0.06 0.06 0.06 0.06	ab b-f a c-f b-e b-f def f f b-f bcd ef def bcd ef bcd a c-f bcd a a	Yield 25-30n T/Hz 0.18 0.15 0.70 0.22 0.12 0.18 0.05 0.06 0.09 0.03 0.14 0.26 0.04 0.01 0.13 0.23 0.22 0.19 0.21	b-g	30-35n T/Ha 0.69 0.67 1.79 0.50 0.31 0.40 0.10 0.25 0.11 0.07 0.19 0.14 0.70 0.35 0.06 0.08 0.51 0.55 0.32 0.49 0.69	b-e b-f b-f c-f def b-f f b-b-b-f f b-b-b-b-b-b-b-b-b-e b-e	Yield 35-40r T/Hz 1.45 1.33 2.95 1.39 0.73 0.80 0.22 0.48 0.23 0.14 0.45 0.30 1.18 1.22 0.21 0.11 1.69 0.63 0.56 1.17	here is a second of the control of t	40-45n T/Ha 3.23 2.40 4.84 3.21 1.27 1.37 0.57 0.61 0.77 0.44 0.69 0.55 2.91 2.43 0.41 0.15 3.91 2.33 1.78 1.16 2.25	bc cde a cde a bc cde	4.88 3.63 6.01 2.69 2.32 0.99 1.08 1.17 0.99 1.71 0.69 5.50 6.11 1.04 0.61 7.34 5.61 2.15 2.26 4.01	l Cde efg a bc f-i ij ij hij ij cd bc ij j abbcd gg-j f-j f-j	Yield 50-55n T/Hz 6.66 5.39 8.12 8.15 2.70 3.72 1.50 3.51 2.56 2.31 1.92 0.89 8.07 9.22 2.94 2.08 8.67 10.42 3.53 6.08	dd mmm a cdd efg a-cc abo
Yield by Variety and Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Untreated Maris Peer Treated Elland Treated Innovator Untreated Innovator Untreated Eurostar Untreated Eurostar Untreated Buster Untreated Buster Untreated Buster Untreated Amanda Untreated Karelia Untreated Karelia Untreated Karelia Treated Cinderella Treated Lanorma Untreated Lanorma Untreated Lanorma Untreated Lanorma Untreated Lanorma Treated Tyson Untreated	atment Yield Total T/Ha 36.56 37.43 38.98 53.42 50.08 54.14 47.52 52.93 38.35 48.75 45.94 59.50 50.16 62.57 60.05 66.04 38.02 50.89 63.56 67.06 49.92	k k k jk e-h ghi e-i k ghi ij b-e ab k f-i a-d a-e ab k f-i a-d a-e	Yield <25m T/Hz 0.11 0.06 0.17 0.05 0.06 0.03 0.02 0.00 0.01 0.03 0.00 0.06 0.08 0.01 0.02 0.00 0.00 0.06 0.08 0.01 0.02 0.00 0.01 0.02 0.09 0.04 0.06 0.06 0.06 0.06	ab b-f a c-f b-e b-f def f b-f bcd def bc c-f b-e a b-f	Yield 25-30n T/Hz 0.18 0.15 0.70 0.22 0.12 0.18 0.05 0.06 0.09 0.03 0.14 0.26 0.04 0.01 0.13 0.23 0.22 0.19 0.21	b-g	30-35n T/Ha 0.69 0.67 1.79 0.50 0.31 0.40 0.10 0.25 0.11 0.07 0.19 0.14 0.70 0.35 0.06 0.08 0.51 0.55 0.32 0.49 0.69	b b a a b-e b-f c-f def b b-f f bcd bc b-f b-e b b-f	Yield 35-40r T/Hz 1.45 1.33 2.95 1.39 0.73 0.80 0.22 0.48 0.23 0.14 0.45 0.30 1.18 1.22 0.21 0.11 1.69 0.63 0.56 1.17	bc bc a bcd cc-g g g g g g bc-f bc-f bc-f bc-f bc-f	40-45n T/Ha 3.23 2.40 4.84 3.21 1.27 1.37 0.57 0.61 0.77 0.44 0.69 0.55 2.91 2.43 0.41 0.15 3.91 2.33 1.78 1.16 2.25	bc cde a bc e-k e-j ijk ijk h-k ijk bcd cde jk ab c-f d-h g-k c-g e-j	4.88 3.63 6.01 2.69 2.32 0.99 1.08 1.17 0.99 1.71 0.69 5.50 6.11 1.04 0.61 7.34 5.61 2.15 2.26 4.01	l Cde efg a bc f-i f-i ji ji hiji ji cd bc ij ab bcd g-j def g-j def g-j	Yield 50-55n T/Hz 6.66 5.39 8.12 8.15 2.70 3.72 1.50 3.51 2.56 2.31 1.92 0.89 8.07 9.22 2.94 2.08 8.67 10.42 3.53 6.08	d mm a cdd efg a-c abc h- g- kl g- h- h- i-l ab a hij g- d-
Treatment Cara Untreated Cara Treated Maris Peer Untreated Maris Peer Untreated Elland Untreated Elland Treated Innovator Untreated Eurostar Untreated Eurostar Untreated Buster Untreated Buster Treated Buster Treated Amanda Untreated Amanda Untreated Cinderella Untreated Karelia Untreated Lanorma Treated Lanorma Treated Tyson Untreated	atment Yield Total T/Ha 36.56 37.43 38.98 53.42 50.08 54.14 47.52 52.93 38.35 48.75 45.94 59.50 50.16 62.57 60.05 66.04 38.02 50.89 63.56 67.06 49.92	k k jk e-h hi e-i k ghi jj b-e ghi a-d a-e k f-i abc a ghi c-f	Yield <25m T/Hz 0.11 0.06 0.17 0.05 0.06 0.03 0.02 0.00 0.01 0.03 0.00 0.06 0.08 0.01 0.02 0.00 0.00 0.06 0.08 0.01 0.02 0.00 0.01 0.02 0.09 0.04 0.06 0.06 0.06 0.06	ab b-f a c-f b-e b-f def f f b-f bcd ef def bcd ef bcd a c-f bcd a a	Yield 25-30n T/Hz 0.18 0.15 0.70 0.22 0.12 0.18 0.05 0.06 0.09 0.03 0.14 0.26 0.04 0.01 0.13 0.23 0.22 0.19 0.21	b-g	30-35n T/Ha 0.69 0.67 1.79 0.50 0.31 0.40 0.10 0.25 0.11 0.07 0.19 0.14 0.70 0.35 0.06 0.08 0.51 0.55 0.32 0.49 0.69	b-e b-f b-f c-f def b-f f b-b-b-f f b-b-b-b-b-b-b-b-b-e b-e	Yield 35-40r T/Hz 1.45 1.33 2.95 1.39 0.73 0.80 0.22 0.48 0.23 0.14 0.45 0.30 1.18 1.22 0.21 0.11 1.69 0.63 0.56 1.17	here is a second of the control of t	40-45n T/Ha 3.23 2.40 4.84 3.21 1.27 1.37 0.57 0.61 0.77 0.44 0.69 0.55 2.91 2.43 0.41 0.15 3.91 2.33 1.78 1.16 2.25	bc cde a cde a bc cde	4.88 3.63 6.01 2.69 2.32 0.99 1.08 1.17 0.99 1.71 0.69 5.50 6.11 1.04 0.61 7.34 5.61 2.15 2.26 4.01	cde efg a bc f-i f-j ij hij j cd bc ij j ab bcd g-j def	Yield 50-55n T/Hz 6.66 5.39 8.12 8.15 2.70 3.72 1.50 3.51 2.56 2.31 1.92 0.89 8.07 9.22 2.94 2.08 8.67 10.42 3.53 6.08	dd mmm a cdd efg a-cc abo

<u>Table 7b: Yield (tonnes per ha) in marketable fraction (45-65mm and 65-85mm) and in size fractions</u>

<u>from 55mm to >85mm</u>

	Yield	i	Yield	1	Yield	d	Yield	1	Yield	1	Yield	i i	Yield	t	Yield		Yield	d
Treatment	55-60n		60-65n		65-70r		70-75n		75-80n		80-85r		>85m		45-65n		>65m	
Troutmont	T/Ha		T/Ha		T/Ha		T/Ha		T/Ha		T/Ha		T/H:		T/Ha		T/Ha	
Cara	6.70	de	5.98	ef	4.99	ef	3.18	е	0.59	_	0.16	d	0	d	22.95	def	8.91	de
Maris Peer	9.00	bc	6.77	def	4.59	ef	2.37	e	0.39	g	0.00	d	0	d	31.05	bc	7.25	de
Elland	6.21	de	7.84	cde	11.20	abc	7.40	d	6.24	g de	2.88	bc	1.981	bc	19.75	fg	29.71	b
	4.81	ef	8.61		10.22	bcd	7.92	d	8.33	bcd	2.30	bcd	3.268	ab	16.95		32.04	b
Innovator			4.47	bcd				cd								g		
Eurostar	3.79	f		f	8.20	cd	8.73		7.50	cd	4.56	ab	1.83	bcd	11.79	h	30.82	b
Buster	3.75	f	5.03	f	9.13	cd	12.19	ab	8.93	abc	5.77	a	4.08	a	11.39	h	40.10	a
Amanda	12.22	a	11.82	a	7.31	de	3.85	е	1.55	fg	0.51	d	0.00	d	38.49	а	13.22	d
Karelia	5.70	def	10.40	abc	13.95	а	14.30	а	10.39	ab	3.19	bc	1.24	cd	19.43	fg	43.07	а
Cinderella	10.43	ab	6.92	def	3.83	f	1.72	е	0.15	g	0.00	d	0.00	d	33.18	b	5.70	е
Lanorma	6.14	de	9.16	bcd	13.30	ab	11.33	bc	11.27	а	3.40	bc	2.28	abc	21.00	efg	41.58	а
Tyson	8.93	bc	9.00	bcd	8.86	cd	7.30	d	3.73	ef	1.93	cd	1.24	cd	27.16	cd	23.05	С
LSD P=.05		2.08		2.62		3.19		2.73		2.68		2.35		1.90		4.24		6.4
Standard Deviation		2.09		2.63		3.19		2.74		2.69		2.36		1.90		4.25		6.4
CV		29.50		32.51		35.48		36.73		51.61	1	07.70	1	31.73		18.36		25.4
Yield by Treatment																		
	Yield	1	Yield		Yield	d	Yield	ı İ	Yield		Yield	i	Yield	t	Yield		Yield	d
Treatment	55-60n	nm	60-65n	nm	65-70r	nm	70-75n	nm	75-80n	nm	80-85r	nm	>85m	ım	45-65n	nm	>65m	nm
	T/Ha		T/Ha	ı	T/Ha	а	T/Ha	ı	T/Ha	1	T/Ha	a .	T/Ha	а	T/Ha	ı	T/Ha	а
Untreated	6.74	а	7.60	а	7.38	b	6.76	b	4.89	а	1.56	b	1.034	b	22.54	а	21.63	b
30kg/ha Nemathorin	7.42	а	8.55	а	10.63	а	8.16	а	5.52	а	2.82	а	1.855	а	23.77	а	28.99	а
LSD P=.05		0.85		1.07		1.30		1.12		1.09		0.96		0.77		1.73		2.6
Standard Deviation		2.09		2.63		3.19		2.74		2.69		2.36		1.90		4.25		6.4
CV		29.50		32.51		35.48		36.73		51.61	-	07.70	-	31.73		18.36		25.4
CV		29.30		32.31		33.40		30.73		31.01		01.10		31.73		10.30		23.4
Yield by Variety and Trea	atment																	
	Yield	i	Yield	ı	Yield	d	Yield	ı	Yield	ı	Yield	t	Yield	t	Yield	ı	Yield	d
Treatment	55-60n	nm	60-65n	nm	65-70r	nm	70-75n	nm	75-80n	nm	80-85r	nm	>85m	ım	45-65n	nm	>65m	nm
	T/Ha	1	T/Ha	ı	T/Ha	а	T/Ha	1	T/Ha	1	T/Ha	a	T/Ha	a	T/Ha	ı	T/Ha	а
Cara Untreated	6.52	e-i	5.64	d-g	4.32	h-k	2.60	klm	0.29	jk	0.00	g	0	е	23.68	d-g	7.22	kln
Cara Treated	6.88	e-h	6.33	c-g	5.66	g-j	3.75	i-m	0.88	ijk	0.32	fg	0	е	22.22	d-g	10.60	jkl
Maris Peer Untreated	6.91	e-h	3.43	g	1.79	jk	0.00	m	0.00	k	0.00	g	0	е	26.74	cde	1.79	ĺm
Maris Peer Treated	11.09	bc	10.11	ab	7.40	e-i	4.73	h-I	0.58	jk	0.00	g	0	е	35.36	ab	12.71	ijk
Elland Untreated	5.04	g-k	5.75	d-g	9.95	b-q	8.24	d-h	7.79	b-e	2.62	b-g	2.82	bcd	16.17	h-I	31.42	de
Elland Treated	7.38	d-g	9.93	abc	12.46	a-d	6.57	f-j	4.70	e-h	3.13	b-g	1.14	b-e	23.33	d-g	28.01	fg
Innovator Untreated	3.59	ijk	8.54	b-f	8.43	d-h	9.98	b-q	8.12	b-e	1.96	d-g	3.48	b	14.61	i-m	31.97	de
Innovator Treated	6.04	f-k	8.67	b-e	12.01	a-d	5.86	h-k	8.55	a-d	2.64	b-g	3.06	bcd	19.30	f-j	32.12	de
Eurostar Untreated	4.20	h-k	4.90	fg	7.07	e-i	7.35	e-i	5.98	d-g	3.46	b-g b-f	0.47	de	12.84	klm	24.32	fgl
Eurostar Treated	3.39	jk	4.90	g	9.32	c-g	10.12	b-f	9.03	a-d	5.66	ab	3.19	bc	10.74	lm	37.32	cd
Buster Untreated	4.27	h-k	5.44	d-q	8.90	d-g	10.77	b-e	6.35	c-f	3.66	b-e	1.47	b-e	13.34	j-m	31.15	de
Buster Treated	3.23	n-ĸ	4.63		9.36	c-g	13.61	ab	11.51	ab	7.89	а	6.69	а	9.43	m J-III	49.06	a
Amanda Untreated	14.24	a	10.82	g ab	3.18		1.46	lm	1.91	h-k	0.00		0.09	e	38.63	a	6.55	kln
Amanda Untreated Amanda Treated		bcd			11.44	ijk				h-k	1.01	g	0		38.35			
Karelia Untreated	10.21 5.03		12.82 12.00	ab	11.44	a-e ab	6.24 12.32	g-k bc	1.20 9.78	n-ĸ abc	1.01	efg	0.39	e de	21.00	a	19.89 38.34	gh
		g-k										d-g				e-h		CC
Karelia Treated	6.37	f-i	8.81	bcd	13.73	abc	16.28	a	11.01	ab	4.71	a-d	2.095	b-e	17.86	g-k	47.81	ab
Cinderella Untreated	9.42	b-e	4.98	efg	1.07	k	0.22	m	0.00	k	0.00	g	0.00	е	30.40	bc	1.29	m
Cinderella Treated	11.45	ab	8.87	bcd	6.59	f-i	3.22	j-m	0.30	jk	0.00	g	0.00	е	35.95	ab	10.12	j-n
Lanorma Untreated	6.30	f-j	9.90	abc	13.66	abc	11.68	bcd	10.32	ab	1.50	d-g	1.59	b-e	21.82	d-h	38.74	bc
	5.97	f-k	8.43	b-f	12.93	a-d	10.99	b-e	12.22	а	5.30	abc	2.98	bcd	20.19	f-i	44.41	ab
	8.47	c-f	8.47	b-f	5.54	g-k	6.63	f-j	3.65	f-k	1.88	d-g	0.75	cde	27.02	cd	18.45	hi
Lanorma Treated Tyson Untreated			9.53	abc	12.18	a-d	7.96	d-h	3.81	f-j	1.97	c-g	1.73	b-e	27.30	cd	27.65	fg
Tyson Untreated	9.39	b-e	9.55	auc	.20													
	9.39	2.95	9.55	3.70	.20	4.51		3.86		3.79		3.33		2.68		6.00		9.0
Tyson Untreated Tyson Treated	9.39		9.55		12.10			3.86 2.74				3.33 2.36		2.68 1.90		6.00 4.25		9.0

Table 8a: Total tuber numbers (per ha) and number in size fractions between 25mm and 55mm

	Numbe	er	Numb	er	Numb	er	Numb	er	Numbe	er	Numb	er	Numbe	er	Numbe	er
Treatment	Total		<25m	m	25-30m	m	30-35n	nm	35-40m	ım	40-45m	ım	45-50m	m	50-55m	ım
	No/Ha		No/H	а	No/Ha	а	No/H	а	No/Ha	a	No/Ha	а	No/Ha	a	No/Ha	
Cara	381944	С	10648	abc	11574	bc	27778	b	37500	bc	52315	b	56481	С	60648	С
Maris Peer	542593	а	13426	а	31944	а	49074	а	58334	а	75463	а	95370	а	80555	b
Elland	289815	е	6019	c-f	8796	bcd	12963	cde	18982	de	20833	efg	28704	def	27778	def
Innovator	225000	f	2778	efg	6019	bcd	6019	de	8796	е	10648	fgh	12500	g	21296	efg
Eurostar	186574	f	463	g	3704	cd	3704	е	5093	е	9722	gh	12963	fg	20370	fg
Buster	229630	f	1389	fg	4167	cd	6482	de	9722	е	11111	fgh	15278	efg	13426	g
Amanda	485185	b	8333	bcd	12963	b	20833	bc	31482	cd	46759	bc	74537	b	81944	b
Karelia	307870	de	1852	fg	1852	d	2778	е	4167	е	5093	h	11111	g	24074	efg
Cinderella	495370	ab	8796	a-d	12500	b	22222	bc	47222	ab	60648	ab	91667	а	97685	а
Lanorma	389352	С	7407	cde	12963	b	16204	bcd	15278	е	26852	de	29630	de	34722	de
Tyson	446759	b	12500	ab	13889	b	20833	bc	32407	bcd	37037	cd	43982	cd	64815	С
1.00.0.05		0500		1057		2000				1 1007		1 1000		10101		1004
LSD P=.05		0523		4857		8206		11755		14837		14909		16191		13917
Standard Deviation	5	0651		4869		8227		11785		14874	1	14947		16232		13952
CV		14		75		74		71		62		47		39		30
Tuber number by Treatr	nent															
	Numbe	er	Numb	er	Numb	er	Numb	er	Numbe	er	Numb	er	Numbe	er	Numbe	er
Treatment	Total	1	<25m	m	25-30m	ım	30-35n	nm	35-40m	ım	40-45m	nm	45-50m	m	50-55m	nm
	No/Ha	а	No/H	а	No/Ha	а	No/H	а	No/Ha	а	No/Ha	а	No/Ha	3	No/Ha	а
Untreated	357407	а	8025	а	11883	а	19753	а	25772	а	36960	а	46065	а	46065	а
30kg/ha Nemathorin	363349	а	4938	b	10494	а	13657	b	21991	а	26698	b	37963	b	48303	а
LSD P=.05		0626		1983		3350		4799		6057		6087		6610		5681
Standard Deviation	5	0651		4869		8227		11785		14874	1	14947		16232		13952
CV		14		75		74		71		62		47		39		30
-																
Tuber number by Variet			Mirmala		Misseele		Misseele		Numbe		Mirmala		Miranala		Missonala	
Treatment	Numbe Total	_	Numb <25m	_	Number 25-30m	_	Numb 30-35n	_	35-40m		Numb 40-45m	-	Number 45-50m		Number 50-55m	
Treatment	No/Ha		No/H		No/H		No/H		No/Ha		40-4511 No/Ha		No/Ha		No/Ha	
Cara Untreated	399074	def	13889	abc	12037	b-f	29630	b	38889	bc	59259	bc	63889	cde	66667	cd
Cara Treated	364815	fg	7407	c-f	11111	b-f	25926	b-e	36111	bcd	45370	cde	49074	efg	54630	de
Maris Peer Untreated	581482	a	20371	a a	49074	р-1 а	76852	а	77778	a	87963	a	109259	a	79629	bc
Maris Peer Treated	503704	bc	6481	d-g	14815	bc	21296	b-g	38889	bc	62963	bc	81481	bc	81482	bc
Elland Untreated	264815	h-k	6482	d-g	7408	b-f	11111	d-i	17593	d-g	19445	ghi	30556	ghi	23148	f-i
Elland Treated	314815	ghi	5556	efq	10185	b-f	14815	b-i	20370	c-g	22222	f-i	26852	ghi	32408	fgh
Innovator Untreated	192593	lm	2778	fg	2778	def	3704	hi	5556	g	10185	hi	11111	i	12963	hi
Innovator Treated	257408	i-I	2778	fg	9259	b-f	8333	f-i	12037	fg	11111	hi	13889	i	29630	fgh
Eurostar Untreated	184259	m	0	g	4630	c-f	4630	hi	6482	g	12037	hi	13889	i	21296	f-i
Eurostar Treated	188889	lm	926	fg	2778	def	2778	i	3704	g	7408	i	12037	i	19445	ghi
Buster Untreated	240741	j-m	2778	fg	6482	b-f	7408	f-i	12037	fg	12037	hi	22223	hi	18519	ghi
Buster Treated	218519	klm	0	g	1852	ef	5556	ghi	7407	g	10185	hi	8333	i	8333	i
Amanda Untreated	461111	bcd	6482	d-g	9259	b-f	26852	bcd	30556	b-f	50926	cd	71296	cde	75926	bc
		bc	10185	cde	16667	b	14815	b-i	32408	b-f	42593	c-f	77778	cd	87963	ab
Amanda Treated	509259	DC 1		fg	2778	def	2778	i	5556	g	7407	i	13889	i	26852	f-i
	509259 301852	g-j	926			f	2778	i	2778	g	2778	i	8334	i	21296	f-i
Amanda Treated			926 2778	fg	926	1 1										
Amanda Treated Karelia Untreated	301852	g-j			926 9259	b-f	22223	b-f	48148	b	75926	ab	103704	ab	91667	ab
Amanda Treated Karelia Untreated Karelia Treated	301852 313889	g-j ghi	2778	fg				b-f b-f	48148 46296	b	75926 45371	ab cde	103704 79630			ab a
Amanda Treated Karelia Untreated Karelia Treated Cinderella Untreated	301852 313889 479630	g-j ghi bc	2778 12963	fg bcd	9259	b-f	22223							ab	91667	
Amanda Treated Karelia Untreated Karelia Treated Cinderella Untreated Cinderella Treated Lanorma Untreated	301852 313889 479630 511111	g-j ghi bc ab	2778 12963 4630	fg bcd efg	9259 15741	b-f bc	22223 22222	b-f	46296	b	45371	cde	79630	ab cd	91667 103704	a fg
Amanda Treated Karelia Untreated Karelia Treated Cinderella Untreated Cinderella Treated Lanorma Untreated Lanorma Treated	301852 313889 479630 511111 391667	g-j ghi bc ab def	2778 12963 4630 7407	fg bcd efg c-f	9259 15741 13889	b-f bc bcd	22223 22222 12963	b-f c-i	46296 15741	b d-g	45371 33333	cde d-g	79630 28704	ab cd ghi	91667 103704 34259	a fg
Amanda Treated Karelia Untreated Karelia Treated Cinderella Untreated Cinderella Treated Lanorma Untreated Lanorma Treated Tyson Untreated	301852 313889 479630 511111 391667 387037	g-j ghi bc ab def ef	2778 12963 4630 7407 7408	fg bcd efg c-f c-f	9259 15741 13889 12037	b-f bc bcd b-f	22223 22222 12963 19445	b-f c-i b-h	46296 15741 14815	b d-g efg	45371 33333 20371	cde d-g ghi	79630 28704 30556	ab cd ghi ghi	91667 103704 34259 35185	a fg efg
Amanda Treated Karelia Untreated Karelia Treated Cinderella Untreated Cinderella Treated Lanorma Untreated Lanorma Treated Tyson Untreated Tyson Treated	301852 313889 479630 511111 391667 387037 455556 437963	g-j ghi bc ab def ef b-e cde	2778 12963 4630 7407 7408 18519	fg bcd efg c-f c-f ab d-g	9259 15741 13889 12037 14815 12963	b-f bc bcd b-f bc b-e	22223 22222 12963 19445 28704 12963	b-f c-i b-h bc c-i	46296 15741 14815 33333 31482	b d-g efg b-e b-f	45371 33333 20371 44445 29630	cde d-g ghi cde e-h	79630 28704 30556 57408 30556	ab cd ghi ghi def ghi	91667 103704 34259 35185 63889 65741	a fg efg cd cd
Amanda Treated Karelia Untreated Karelia Treated Cinderella Untreated Cinderella Treated Lanorma Untreated Lanorma Treated Tyson Untreated Tyson Treated Tyson Treated LSD P=.05	301852 313889 479630 511111 391667 387037 455556 437963	g-j ghi bc ab def ef b-e cde	2778 12963 4630 7407 7408 18519	fg bcd efg c-f c-f ab d-g	9259 15741 13889 12037 14815 12963	b-f bc bcd b-f bc b-e	22223 22222 12963 19445 28704 12963	b-f c-i b-h bc c-i	46296 15741 14815 33333 31482	b d-g efg b-e b-f	45371 33333 20371 44445 29630	cde d-g ghi cde e-h	79630 28704 30556 57408 30556	ab cd ghi ghi def ghi	91667 103704 34259 35185 63889 65741	a fg efg cd cd
Amanda Treated Karelia Untreated Karelia Treated Cinderella Untreated Cinderella Treated	301852 313889 479630 511111 391667 387037 455556 437963	g-j ghi bc ab def ef b-e cde	2778 12963 4630 7407 7408 18519	fg bcd efg c-f c-f ab d-g	9259 15741 13889 12037 14815 12963	b-f bc bcd b-f bc b-e	22223 22222 12963 19445 28704 12963	b-f c-i b-h bc c-i	46296 15741 14815 33333 31482	b d-g efg b-e b-f	45371 33333 20371 44445 29630	cde d-g ghi cde e-h	79630 28704 30556 57408 30556	ab cd ghi ghi def ghi	91667 103704 34259 35185 63889 65741	a fg efg cd cd

<u>Table 8b: Tuber number (per ha) in marketable fractions (45-65mm and 65-85mm) and in size</u>

<u>fractions from 55mm to >85mm</u>

	Numbe	er	Numbe	er	Numb	er	Numbe	er	Numbe	er	Numb	er	Numb	er	Numb	oer	Numb	er
Treatment	55-60m	nm	60-65m	ım	65-70n	nm	70-75m	ım	75-80m	nm	80-85n	nm	>85m	m	45-65	mm	>65mi	m
	No/Ha	а	No/Ha	a	No/H	а	No/Ha	a	No/Ha	a	No/H	а	No/H	а	No/H	la	No/Ha	а
Cara	50926	d	35648	def	24074	de	12037	е	1852	h	463	de	0	С	23	def	38426	de
Maris Peer	67593	С	39815	cde	21296	е	8796	е	926	h	0	е	0	С	31	bc	31019	е
Elland	39352	def	37963	de	43519	bc	23148	cd	15741	de	6019	bc	3241	b	20	fg	91667	С
Innovator	30556	ef	40278	cde	37963	bcd	23148	cd	19908	cd	5093	b-e	4630	ab	17	g	90741	С
Eurostar	24074	f	22222	f	31481	cde	25926	С	18056	cde	8796	ab	3241	b	12	h	87500	С
Buster	25926	f	26389	ef	38889	bc	40278	b	23611	bc	12963	а	6944	а	11	h	122685	b
Amanda	88426	а	67130	а	32870	cde	13889	de	4630	gh	1389	cde	0	С	38	а	52778	d
Karelia	42593	de	60648	a	63426	а	52315	a	30093	ab	7870	ab	2315	bc	19	fg	156019	a
Cinderella	83796	ab	43982	bcd	19444	e	6945	e	463	h	0	e	0	С	33	b	26852	е
Lanorma	46759	d	53704	abc	60648	а	41667	b	35185	a	8333	ab	4630	ab	21	efg	150463	а
Tyson	72222	bc	56945	ab	44445	bc	29630	c	12500	ef	5556	bcd	2778	bc	27	cd	94908	C
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,																		
LSD P=.05	1	15485	1	4823		14176		9657		6799		5271		3231		4	2	2099
Standard Deviation	1	15524	1	4861		14212		9681		6816		5284		3240		4	2	2104
CV		30		33		36		38		48		105		127		18		2
Tubas sussibas bu Taaat																		
Tuber number by Treat	Mumber Number	er	Numbe	or .	Numb	er	Numbe	ar .	Numbe	er	Numb	er	Numb	er	Numk	ner	Numbe	er
Treatment	55-60m		60-65m		65-70n		70-75m		75-80m		80-85n		>85m		45-65		>65mi	
Treatment	No/Ha		No/Ha		No/H		No/Ha		No/Ha		No/H		No/H		No/H		No/Ha	
Untreated	49383	а	42207	b	31482	b	22917	b	13349	а	3549	b	1775	b	23	а	73071	b
30kg/ha Nemathorin	54321	a	48303	а	46528	а	28395	а	15278	a	6481	а	3318	а	24	a	100000	а
SUNG/Ha INCHIALIOHH	34321	а	40303	a	40320	а	20393	a	13270	a	0401	a	3310	a	24	а	100000	а
LSD P=.05		6322		6052		5787		3942		2776		2152		1319		2		857
Standard Deviation	-	15524		4861		14212		9681		6816		5284		3240		4		2104
CV	-	30		33		36		38		48		105		127		18		2
OV		30		33		30		30		70		103		121		10		
Tuber number by Varie	tv and Treatm	nent																
Tuber Humber by Varie	Numbe		Numbe	er	Numb	er	Numbe	er	Numbe	er	Numb	er	Numb	er	Numb	oer	Numbe	er
Treatment	55-60m		60-65m	m	65-70n	nm	70-75m		75-80m	nm	80-85n	nm	>85m	m	45-65	mm	>65mi	m
	No/Ha	а	No/Ha	a	No/H	а	No/Ha	a	No/Ha	a	No/H	а	No/H	а	No/H	la	No/Ha	а
Cara Untreated	50000	efg	33334	f-j	20371	g-j	10185	j-m	926	i	0	f	0	е	24	d-g	31481	ij
Cara Treated	51852	ef	37963	e-j	27778	f-i	13889	h-I	2778	hi	926	ef	0	е	22	d-q	45370	hi
Maris Peer Untreated	51852	ef	20370	j	8334	ij	0	m	0	i	0	f	0	е	27	cde	8334	i
Maris Peer Treated	83333	abc	59259	a-d	34259	d-h	17593	g-k	1852	i	0	f	0	е	35	ab	53704	gh
Elland Untreated	31481	f-i	27778	hij	38889	c-q	25926	e-i	19445	de	5556	b-f	4630	bcd	16	h-I	94445	de
Elland Treated													1852	cde	23		88889	de
	47223	e-h	48148	b-h l	48148	a-e	20371	f-i	12037	e-h	6482	b-f				d-a		
	47223 22222	e-h i	48148 38889	b-h d-i	48148 30556	a-e e-h	20371 28704	f-j d-a	12037 18519	e-h de	6482 4630	b-f c-f		bcd		d-g i-m		
Innovator Untreated	22222	i	38889	d-j	30556	e-h	28704	d-g	18519	de	4630	c-f	4630	bcd	15	i-m	87037	de
Innovator Untreated Innovator Treated	22222 38889	i f-i	38889 41667	d-j c-i	30556 45371	e-h a-f	28704 17593	d-g g-k	18519 21297	de cde	4630 5556	c-f b-f	4630 4630	bcd bcd	15 19	i-m f-j	87037 94445	de
Innovator Untreated Innovator Treated Eurostar Untreated	22222 38889 26852	i f-i hi	38889 41667 24074	d-j c-i ij	30556 45371 26852	e-h a-f f-i	28704 17593 22223	d-g g-k f-j	18519 21297 14815	de cde ef	4630 5556 6482	c-f b-f b-f	4630 4630 926	bcd bcd de	15 19 13	i-m f-j klm	87037 94445 71296	de de fgl
Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated	22222 38889 26852 21296	i f-i hi i	38889 41667 24074 20371	d-j c-i ij j	30556 45371 26852 36111	e-h a-f f-i d-g	28704 17593 22223 29630	d-g g-k f-j c-g	18519 21297 14815 21297	de cde ef cde	4630 5556 6482 11111	c-f b-f b-f a-d	4630 4630 926 5556	bcd bcd de bc	15 19 13 11	i-m f-j klm lm	87037 94445 71296 103704	de de fgl
Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated Buster Untreated	22222 38889 26852 21296 29630	i f-i hi i ghi	38889 41667 24074 20371 28704	d-j c-i ij j hij	30556 45371 26852 36111 38889	e-h a-f f-i d-g c-g	28704 17593 22223 29630 36111	d-g g-k f-j c-g b-e	18519 21297 14815 21297 17593	de cde ef cde e	4630 5556 6482 11111 8334	c-f b-f b-f a-d b-e	4630 4630 926 5556 2778	bcd bcd de bc b-e	15 19 13 11 13	i-m f-j klm lm j-m	87037 94445 71296 103704 103704	de de fgl de
Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated Buster Untreated Buster Treated	22222 38889 26852 21296 29630 22222	i f-i hi i ghi i	38889 41667 24074 20371 28704 24074	d-j c-i ij j hij	30556 45371 26852 36111 38889 38889	e-h a-f f-i d-g c-g c-g	28704 17593 22223 29630 36111 44444	d-g g-k f-j c-g b-e b	18519 21297 14815 21297 17593 29630	de cde ef cde e abc	4630 5556 6482 11111 8334 17593	c-f b-f b-f a-d b-e a	4630 4630 926 5556 2778 11111	bcd bcd de bc b-e a	15 19 13 11 13	i-m f-j klm lm j-m m	87037 94445 71296 103704 103704 141667	de de fgl de de
Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated Eurostar Treated Buster Untreated Buster Treated Amanda Untreated	22222 38889 26852 21296 29630 22222 102778	i f-i hi i ghi i	38889 41667 24074 20371 28704 24074 61111	d-j c-i ij j hij ij abc	30556 45371 26852 36111 38889 38889 14815	e-h a-f f-i d-g c-g c-g hij	28704 17593 22223 29630 36111 44444 5556	d-g g-k f-j c-g b-e b	18519 21297 14815 21297 17593 29630 5556	de cde ef cde e abc f-i	4630 5556 6482 11111 8334 17593 0	c-f b-f b-f a-d b-e a f	4630 4630 926 5556 2778 11111 0	bcd bcd de bc b-e a e	15 19 13 11 13 9 39	i-m f-j klm lm j-m m	87037 94445 71296 103704 103704 141667 25926	de de fgl de de bo
Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated Buster Untreated Buster Untreated Buster Treated Amanda Untreated Amanda Treated	22222 38889 26852 21296 29630 22222 102778 74074	i f-i hi i ghi i a bcd	38889 41667 24074 20371 28704 24074 61111 73148	d-j c-i ij j hij ij abc a	30556 45371 26852 36111 38889 38889 14815 50926	e-h a-f f-i d-g c-g c-g hij a-d	28704 17593 22223 29630 36111 44444 5556 22222	d-g g-k f-j c-g b-e b klm f-j	18519 21297 14815 21297 17593 29630 5556 3704	de cde ef cde e abc f-i ghi	4630 5556 6482 11111 8334 17593 0 2778	c-f b-f b-f a-d b-e a f	4630 4630 926 5556 2778 11111 0	bcd bcd de bc b-e a e	15 19 13 11 13 9 39 38	i-m f-j klm lm j-m m a	87037 94445 71296 103704 103704 141667 25926 79630	de de fgl de de bo
Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated Buster Untreated Buster Treated Amanda Untreated	22222 38889 26852 21296 29630 22222 102778 74074 37037	i f-i hi i ghi i	38889 41667 24074 20371 28704 24074 61111 73148 67593	d-j c-i ij j hij ij abc	30556 45371 26852 36111 38889 38889 14815 50926 62037	e-h a-f f-i d-g c-g c-g hij a-d a	28704 17593 22223 29630 36111 44444 5556 22222 43518	d-g g-k f-j c-g b-e b klm f-j	18519 21297 14815 21297 17593 29630 5556 3704 27778	de cde ef cde e abc f-i	4630 5556 6482 11111 8334 17593 0	c-f b-f b-f a-d b-e a f	4630 4630 926 5556 2778 11111 0 0	bcd bcd de bc b-e a e	15 19 13 11 13 9 39	i-m f-j klm lm j-m m a a e-h	87037 94445 71296 103704 103704 141667 25926 79630 137963	de de fgl de de bo
Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated Buster Untreated Buster Treated Buster Treated Amanda Untreated Amanda Treated Karelia Untreated Karelia Untreated	22222 38889 26852 21296 29630 22222 102778 74074 37037 48148	i f-i hi i ghi i a bcd f-i e-h	38889 41667 24074 20371 28704 24074 61111 73148 67593 53704	d-j c-i ij j hij ij abc a ab a-f	30556 45371 26852 36111 38889 38889 14815 50926 62037 64815	e-h a-f f-i d-g c-g c-g hij a-d a a	28704 17593 22223 29630 36111 44444 5556 22222 43518 61111	d-g g-k f-j c-g b-e b klm f-j b	18519 21297 14815 21297 17593 29630 5556 3704 27778 32407	de cde ef cde e abc f-i ghi bcd ab	4630 5556 6482 11111 8334 17593 0 2778 3704 12037	c-f b-f b-f a-d b-e a f ef def abc	4630 4630 926 5556 2778 11111 0 0 926 3704	bcd bcd de bc b-e a e e de b-e	15 19 13 11 13 9 39 38 21 18	i-m f-j klm lm j-m m a a e-h	87037 94445 71296 103704 103704 141667 25926 79630 137963 174074	de de fgl de de bo
Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated Buster Untreated Buster Treated Buster Treated Amanda Untreated Amanda Treated Karelia Untreated Karelia Untreated Cinderella Untreated	22222 38889 26852 21296 29630 22222 102778 74074 37037 48148 76852	i f-i hi i ghi i a bcd f-i e-h bc	38889 41667 24074 20371 28704 24074 61111 73148 67593 53704 32408	d-j c-i ij j hij ij abc a	30556 45371 26852 36111 38889 38889 14815 50926 62037 64815 5556	e-h a-f f-i d-g c-g c-g hij a-d a j	28704 17593 22223 29630 36111 44444 5556 22222 43518 61111 926	d-g g-k f-j c-g b-e b klm f-j b a	18519 21297 14815 21297 17593 29630 5556 3704 27778 32407 0	de cde ef cde e abc f-i ghi bcd ab i	4630 5556 6482 11111 8334 17593 0 2778 3704 12037 0	c-f b-f b-f a-d b-e a f ef def abc f	4630 4630 926 5556 2778 11111 0 0 926 3704 0	bcd bcd de bc b-e a e e de b-e e	15 19 13 11 13 9 39 38 21 18	i-m f-j klm lm j-m m a e-h g-k	87037 94445 71296 103704 103704 141667 25926 79630 137963 174074 6482	de de fg de de be ij ef be a
Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated Eurostar Treated Buster Untreated Buster Untreated Amanda Untreated Amanda Untreated Karelia Untreated Karelia Treated Cinderella Untreated Cinderella Untreated	22222 38889 26852 21296 29630 22222 102778 74074 37037 48148 76852 90741	i f-i hi i ghi i a bcd f-i e-h bc ab	38889 41667 24074 20371 28704 24074 61111 73148 67593 53704 32408 55556	d-j c-i ij j hij ij abc a ab a-f g-j	30556 45371 26852 36111 38889 38889 14815 50926 62037 64815 5556 33333	e-h a-f f-i d-g c-g c-g hij a-d a j d-h	28704 17593 22223 29630 36111 44444 5556 22222 43518 61111 926 12963	d-g g-k f-j c-g b-e b klm f-j b a lm i-m	18519 21297 14815 21297 17593 29630 5556 3704 27778 32407 0	de cde ef cde e abc f-i ghi bcd ab i i	4630 5556 6482 11111 8334 17593 0 2778 3704 12037 0	c-f b-f b-f a-d b-e a f ef def abc f	4630 4630 926 5556 2778 11111 0 0 926 3704 0	bcd bcd de bc b-e a e e de b-e e e	15 19 13 11 13 9 39 38 21 18 30 36	i-m f-j klm lm j-m a a e-h g-k bc ab	87037 94445 71296 103704 103704 141667 25926 79630 137963 174074 6482 47222	de de fg de de be ij ef be a j
Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated Eurostar Treated Buster Untreated Buster Treated Amanda Untreated Amanda Treated Karelia Untreated Karelia Treated Cinderella Untreated Cinderella Treated Lanorma Untreated	22222 38889 26852 21296 29630 22222 102778 74074 37037 48148 76852 90741 48148	i f-i hi i ghi i a bcd f-i e-h bc ab e-h	38889 41667 24074 20371 28704 24074 61111 73148 67593 53704 32408 55556 57408	d-j c-i ij j hij ij abc a ab a-f g-j a-e a-e	30556 45371 26852 36111 38889 38889 14815 50926 62037 64815 5556 33333 62037	e-h a-f f-i d-g c-g c-g hij a-d a j d-h a	28704 17593 22223 29630 36111 44444 5556 22222 43518 61111 926 12963 42593	d-g g-k f-j c-g b-e b klm f-j b a lm i-m	18519 21297 14815 21297 17593 29630 5556 3704 27778 32407 0 926 31482	de cde ef cde e abc f-i ghi bcd ab i i ab	4630 5556 6482 11111 8334 17593 0 2778 3704 12037 0 0 3704	c-f b-f b-f a-d b-e a f ef def abc f f	4630 4630 926 5556 2778 11111 0 0 926 3704 0 0 2778	bcd bcd de bc b-e a e e de b-e e b-e e b-e	15 19 13 11 13 9 39 38 21 18 30 36 22	i-m f-j klm lm j-m a e-h g-k bc ab d-h	87037 94445 71296 103704 103704 141667 25926 79630 137963 174074 6482 47222 142593	ded ded ded ded ded ded ded ded ded ded
Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated Buster Untreated Buster Untreated Buster Treated Amanda Untreated Amanda Treated Karelia Untreated Karelia Treated Cinderella Untreated Cinderella Treated Lanorma Untreated Lanorma Untreated	22222 38889 26852 21296 29630 22222 102778 74074 37037 48148 76852 90741 48148 45370	i f-i hi i ghi i a bcd f-i e-h bc ab e-h fgh	38889 41667 24074 20371 28704 24074 61111 73148 67593 53704 32408 55556 57408 50000	d-j c-i ij j hij ij abc a ab a-f g-j a-e a-e b-g	30556 45371 26852 36111 38889 38889 14815 50926 62037 64815 5556 33333 62037 59260	e-h a-f f-i d-g c-g c-g hij a-d a j d-h a ab	28704 17593 22223 29630 36111 44444 5556 22222 43518 61111 926 12963 42593 40741	d-g g-k f-j c-g b-e b klm f-j b a lm i-m bc	18519 21297 14815 21297 17593 29630 5556 3704 27778 32407 0 926 31482 38889	de cde ef cde e abc f-i ghi bcd ab i ab a	4630 5556 6482 11111 8334 17593 0 2778 3704 12037 0 0 3704 12963	c-f b-f b-f a-d b-e a f ef def abc f f def abc	4630 4630 926 5556 2778 11111 0 926 3704 0 0 2778 6481	bcd bcd de bc b-e a e de b-e e b-e b-e b-e b-e b-e	15 19 13 11 13 9 39 38 21 18 30 36 22 20	i-m f-j klm lm j-m a a e-h g-k bc ab d-h f-i	87037 94445 71296 103704 103704 141667 25926 79630 137963 174074 6482 47222 142593 158333	ded ded ded fg ded ded ded ded ded ded ded ded ded de
Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated Buster Untreated Buster Treated Buster Treated Amanda Untreated Amanda Treated Karelia Untreated Karelia Untreated Cinderella Untreated Cinderella Treated Lanorma Untreated Lanorma Untreated Tyson Untreated	22222 38889 26852 21296 29630 22222 102778 74074 37037 48148 76852 90741 45370 68519	i f-i hi i ghi i a bcd f-i e-h bc ab e-h fgh cde	38889 41667 24074 20371 28704 24074 61111 73148 67593 53704 32408 55556 57408 50000 53704	d-j c-i ij j hij ij abc a ab a-f g-j a-e a-e b-g a-f	30556 45371 26852 36111 38889 38889 14815 50926 62037 64815 5556 33333 62037 59260 27778	e-h a-f f-i d-g c-g c-g hij a-d a j d-h a ab f-i	28704 17593 22223 29630 36111 44444 5556 22222 43518 61111 926 12963 40741 26852	d-g g-k f-j c-g b-e b klm f-j b a lm i-m bc bcd e-h	18519 21297 14815 21297 17593 29630 5556 3704 27778 32407 0 926 31482 38889 12037	de cde ef cde e abc f-i ghi bcd ab i ab a e-h	4630 5556 6482 11111 8334 17593 0 2778 3704 12037 0 0 3704 12963 5556	c-f b-f b-f a-d b-e a f def abc f def abc b-f	4630 4630 926 5556 2778 11111 0 926 3704 0 0 2778 6481 1852	bcd bcd de bc b-e a e de b-e e b-e b-e b-cde	15 19 13 11 13 9 39 38 21 18 30 36 22 20 27	i-m f-j klm lm j-m m a e-h g-k bc ab d-h f-i cd	87037 94445 71296 103704 103704 1141667 25926 79630 137963 174074 6482 47222 142593 158333 74074	ded ded ded ded ded ded ded ded ded ded
Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated Buster Untreated Buster Untreated Buster Treated Amanda Untreated Amanda Treated Karelia Untreated Karelia Treated Cinderella Untreated Cinderella Treated Lanorma Untreated Lanorma Untreated	22222 38889 26852 21296 29630 22222 102778 74074 37037 48148 76852 90741 48148 45370	i f-i hi i ghi i a bcd f-i e-h bc ab e-h fgh	38889 41667 24074 20371 28704 24074 61111 73148 67593 53704 32408 55556 57408 50000	d-j c-i ij j hij ij abc a ab a-f g-j a-e a-e b-g	30556 45371 26852 36111 38889 38889 14815 50926 62037 64815 5556 33333 62037 59260	e-h a-f f-i d-g c-g c-g hij a-d a j d-h a ab	28704 17593 22223 29630 36111 44444 5556 22222 43518 61111 926 12963 42593 40741	d-g g-k f-j c-g b-e b klm f-j b a lm i-m bc	18519 21297 14815 21297 17593 29630 5556 3704 27778 32407 0 926 31482 38889	de cde ef cde e abc f-i ghi bcd ab i ab a	4630 5556 6482 11111 8334 17593 0 2778 3704 12037 0 0 3704 12963	c-f b-f b-f a-d b-e a f ef def abc f f def abc	4630 4630 926 5556 2778 11111 0 926 3704 0 0 2778 6481	bcd bcd de bc b-e a e de b-e e b-e b-e b-e b-e b-e	15 19 13 11 13 9 39 38 21 18 30 36 22 20	i-m f-j klm lm j-m a a e-h g-k bc ab d-h f-i	87037 94445 71296 103704 103704 141667 25926 79630 137963 174074 6482 47222 142593 158333	ded ded ded ded ded ded ded book ijj eff book aa j h book aal e-
Innovator Untreated Innovator Treated Eurostar Untreated Eurostar Treated Eurostar Treated Buster Untreated Buster Treated Amanda Untreated Amanda Untreated Karelia Untreated Karelia Treated Cinderella Untreated Cinderella Treated Lanorma Untreated Lanorma Treated Tyson Untreated Tyson Treated	22222 38889 26852 21296 29630 22222 102778 74074 37037 48148 76852 90741 48148 45370 68519 75926	i f-i hi i ghi i a bcd f-i e-h bc ab e-h fgh cde bc	38889 41667 24074 20371 28704 24074 61111 73148 67593 53704 32408 55556 57408 50000 53704 60185	d-j c-i ij j hij ij abc a ab a-f g-j a-e a-e b-g a-f abc	30556 45371 26852 36111 38889 38889 14815 50926 62037 64815 5556 33333 62037 59260 27778 61111	e-h a-f f-i d-g c-g c-g hij a-d a j d-h a ab f-i ab	28704 17593 22223 29630 36111 44444 5556 22222 43518 61111 926 12963 42593 40741 26852 32408	d-g g-k f-j c-g b-e b klm f-j b a lm i-m bc bcd e-h b-f	18519 21297 14815 21297 17593 29630 5556 3704 27778 32407 0 926 31482 38889 12037 12963	de cde ef cde e abc f-i ghi bcd ab i ab a e-h efg	4630 5556 6482 11111 8334 17593 0 2778 3704 12037 0 0 3704 12963 5556	c-f b-f b-f a-d b-e a f ef def abc f def ab b-f b-f	4630 4630 926 5556 2778 11111 0 926 3704 0 0 2778 6481 1852	bcd bcd de bc b-e a e de b-e e b-e b-e b-e b-e b-e b-e b-e	15 19 13 11 13 9 39 38 21 18 30 36 22 20 27	i-m f-j klm lm j-m a e-h g-k bc cd d-h f-i cd	87037 94445 71296 103704 103704 141667 25926 79630 137963 174074 6482 47222 142593 158333 74074 115741	ded ded ded ded ded ded ded ded ded ded
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Nemathorin application resulted in a significant increase in the total yield across all varieties of 7.63 t/ha (16%). Examination of the results for different size fractions indicates that this was due to an increase in the larger size fractions at the expense of smaller grades. However, there was no overall difference in the total number of tubers harvested (Tables 8a and 8b).

The yield of all varieties was improved with Nemathorin application. However, the increase was significant only for Maris Peer, Eurostar, Buster, Amanda, and Cinderella. These varieties can, based on evidence from this trial, be considered as intolerant. Innovator was included in this trial as an example of a resistant and intolerant variety as this has been the experience in other trials and commercially. In this trial the increase in yield with Nemathorin treatment was 5.41 t/ha (11%) and not statistically significant. This might be attributed to the nitrogen application rate (210 kg/ha) which acted to compensate for the damage being caused by PCN.

Of the other varieties which are highly resistant (Elland and Karelia) the evidence from this trial suggest that they are more tolerant of PCN than other varieties. However, additional trials across a range of conditions are required before the tolerance of these varieties can be described with confidence.

Tuber numbers were assessed for all size fractions (Tables 8a and 8b). There was generally no effect of Nemathorin application on the number of tubers harvested. For the variety Maris Peer a significant decrease in the number of tubers was observed with Nemathorin treatment. No other variety interactions were observed.

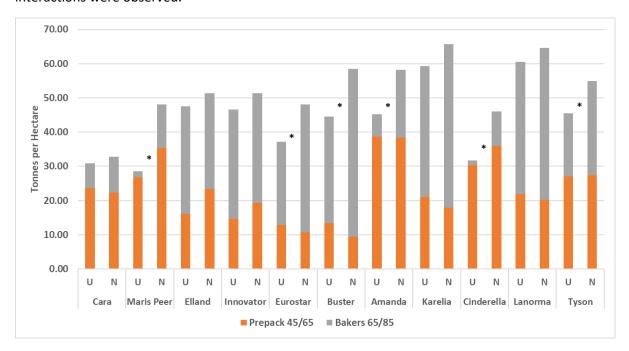


Figure 4: Total yield (tonnes per ha) of Nemathorin treated (N – right columns) and untreated varieties (U – left columns). Varieties with a significant difference in total yield indicated by an asterisk.

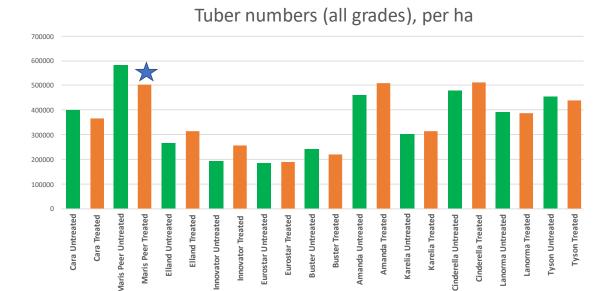


Figure 5: Total tuber numbers (per ha) for Nemathorin treated and untreated varieties. Within variety significant difference indicated

Tuber blemish diseases

Common scab (Table 9a): The incidence of common scab was low (between 1.5 and 10%) in all the varieties except for Cinderella which had a significantly increased incidence of common scab (41.5%). It should be noted that the site was irrigated. However, the regime was uniform across all varieties and the regime not optimised for every variety stage of development.

Silver scurf (Table 9a): Silver scurf incidence was high (average 75%) at the time of assessment. Significant differences were recorded between the treatments with the severity score for the varieties Innovator, Amanda, Karelia, and Tyson being significantly higher than the control variety, Cara.

Black scurf (Table 9a): Black scurf incidence was low. The disease was only recorded in the variety Innovator, with 97.5% of tubers with no incidence of the disease.

Powdery scab (Table 9b): Powdery scab incidence was low with less than 1% of tubers across the trial infected. However, a significantly higher incidence (23%) and severity of disease was recorded for the variety Buster. It should be noted that Buster emerged more slowly that other varieties and the period of susceptibility is likely to have been different from other varieties.

Black dot (Table 9b): The incidence and severity of Black dot was low. However, a significant increase in the amount of black dot on the variety Maris Peer was recorded (4% of tubers infected).

Table 9a: incidence and severity of Common scab (*Streptomyces* spp.), silver scurf (*Helminthosporium solani*) and black scurf (*Rhizoctonia solani*) on harvested tubers

Tuber disease ass	essment	resu	ts									
_							on Scab					
Treatment	Incide	nce	Sever	ity		% o	f Tubers ir	1 Each	Severity	Categ	ory	
	%		0-3		0		1		2		3	
Cara	7.0	bc	0.075	bc	93.0	ab	6.5	bc	0.5	b	0	b
Maris Peer	4.5	С	0.060	bc	95.5	а	4.0	С	0.5	b	0	b
Elland	2.5	С	0.025	С	97.5	а	2.5	С	0	b	0	b
Innovator	1.5	С	0.015	С	98.5	а	1.5	С	0	b	0	b
Eurostar	10.0	bc	0.125	bc	90.0	ab	8.0	bc	1.5	b	0.5	b
Buster	3.5	С	0.035	bc	96.5	а	3.5	С	0	b	0	b
Amanda	6.0	bc	0.065	bc	94.0	ab	5.5	bc	0.5	b	0	b
Karelia	6.0	bc	0.060	bc	94.0	ab	6.0	bc	0	b	0	b
Cinderella	41.5	а	0.520	а	58.5	С	33.0	а	6.5	а	2.0	а
Lanorma	5.0	bc	0.050	bc	95.0	ab	5.0	bc	0	b	0	b
Tyson	3.0	С	0.030	С	97.0	а	3.0	С	0	b	0	b
.,,	0.0		0.000		00		0.0					-
LSD P=.05		9.07		0.12		9.07		7.54		2.75		1.02
Standard Deviation		6.30		0.08		6.30		5.24		1.91		0.71
CV	-	72.37	5	33.32		6.90		69.13	2	08.32	34	11.97
		2.07		30.02		0.00		00.10		00.02		11.07
						Silve	r Scurf					
Treatment	Incide	nce	Sever	ity		% o	f Tubers ir	ı Each	Severity	Categ	orv	
	%		0-3	-	0		1		2	Ĭ	3	
Cara	61.0	е	0.810	de	39.0	ab	43.0	abc	16.0	ef	2.0	cd
Maris Peer	65.0	cde	0.925	cde	35.0	ab	42.5	abc	16.5	ef	6.0	cd
Elland	55.0	е	0.700	е	45.0	а	46.0	abc	8.0	f	1.0	d
Innovator	84.0	a-d	1.260	bc	16.0	c-f	47.5	abc	31.0	bcd	5.5	cd
Eurostar	75.5	а-е	1.005	cde	24.5	b-e	52.5	abc	20.5	def	2.5	cd
Buster	63.5	de	0.750	е	26.5	bcd	48.5	abc	7.5	f	1.0	d
Amanda	92.5	ab	1.540	ab	7.5	ef	41.5	abc	41.0	ab	10.0	bc
Karelia	89.0	ab	1.575	ab	11.0	def	36.5	cd	36.5	bc	15.5	ab
Cinderella	66.5	cde	0.995	cde	33.5	abc	57.0	а	8.5	f	1.0	d
Lanorma	84.5	abc	1.185	bcd	15.5	c-f	55.0	ab	25.0	cde	4.5	cd
Tyson	94.5	а	1.885	а	5.5	f	22.0	d	50.5	а	22.0	а
.,,	00				0.0			-	00.0			
LSD P=.05	2	20.62		0.42		18.15		17.93		13.42		8.26
Standard Deviation		14.33		0.29		12.61		12.47		9.33		5.74
CV	•	19.04	2	25.79	;	52.83	:	28.25		38.41	9	1.21
						Blac	k Scurf					
Treatment	Incide	nce	Sever	ity		% o	f Tubers ir	ı Each	Severity	Categ	ory	
	%		0-3		0		1		2		3	
Cara	0	b	0.000	b	100.0	а	0	b	0	а	0	а
Maris Peer	0	b	0.000	b	100.0	а	0	b	0	а	0	а
Elland	0	b	0.000	b	100.0	а	0	b	0	а	0	а
Innovator	2.5	а	0.025	а	97.5	b	2.5	а	0	а	0	а
Eurostar	0	b	0.000	b	100.0	а	0	b	0	а	0	а
Buster	0	b	0.000	b	100.0	а	0	b	0	а	0	а
Amanda	0	b	0.000	b	100.0	а	0	b	0	а	0	а
Karelia	0	b	0.000	b	100.0	а	0	b	0	а	0	а
Cinderella	0	b	0.000	b	100.0	а	0	b	0	а	0	а
Lanorma	0	b	0.000	b	100.0	a	0	b	0	а	0	а
Tyson	0	b	0.000	b	100.0	а	0	b	0	а	0	a
LSD P=.05		1.71		0.02		1.71		1.71				
Standard Deviation		1.19		0.01		1.19		1.19		0.00		0.00
CV	40	08.08	40	38.80		1.19	4	08.08		0.00		0.00

<u>Table 9b: Incidence and severity of Powdery scab (Spongospora subterranea) and Black dot</u>
<u>(Colletotrichum coccodes). on harvested tubers</u>

					Pow	dery S	Scab					
Treatment	Incider	ice	Severi	ty	9	% of T	ubers in E	ach	Severity (Catego	ry	
	%		0-3		0		1		2		3	
Cara	1.0	b	0.100	b	99.0	а	1.0	b	0	b	0	а
Maris Peer	0.5	b	0.005	b	99.5	а	0.5	b	0	b	0	а
Elland	0.5	b	0.005	b	99.5	а	0.5	b	0	b	0	а
Innovator	0	b	0.000	b	100.0	а	0	b	0	b	0	а
Eurostar	1.5	b	0.015	b	98.5	а	1.5	b	0	b	0	а
Buster	23.0	а	0.255	а	77.0	b	20.5	а	2.5	а	0	а
Amanda	1.0	b	0.010	b	99.0	а	1.0	b	0	b	0	а
Karelia	0	b	0.000	b	100.0	а	0	b	0	b	0	а
Cinderella	0.5	b	0.005	b	99.5	а	0.5	b	0	b	0	а
Lanorma	2.0	b	0.020	b	98.0	а	2.0	b	0	b	0	а
Tyson	1.5	b	0.015	b	98.5	а	1.5	b	0	b	0	а
LSD P=.05		4.86		0.10		4.86		4.19		1.09		
Standard Deviation		3.38		0.07		3.38		2.91		0.76		0.00
CV	1	21.03	18	31.01		3.48		4.62	30	03.51		0.00
Treatment	Incider	re l	Severi	tv		ack Do		ach	Severity (`atego	rv.	
Treatment	%		0-3	-y	0	0011	1		2	Jacego	3	
Cara	1.0	b	0.015	b	99.0	а	0.5	b	0.5	а	0	b
Maris Peer	4.0	a	0.050	a	96.0	a	3.0	b	0.0	a	0.5	а
Elland	1.0	b	0.010	b	99.0	а	1.0	b	0	a	0.0	b
Innovator	0	b	0.000	b	100.0	a	0	b	0	a	0	b
Eurostar	0	b	0.000	b	100.0	а	0	b	0	а	0	b
Buster	1.0	b	0.010	b	99.0	а	1.0	b	0	a	0	b
Amanda	0	b	0.000	b	100.0	а	0	b	0	а	0	b
Karelia	0	b	0.000	b	100.0	a	0	b	0	a	0	b
Cinderella	0	b	0.000	b	100.0	а	0	b	0	а	0	b
Lanorma	1.0	b	0.010	b	74.0	b	26.0	а	0	а	0	b
Tyson	1.5	ab	0.015	b	98.5	a	1.5	b	0	a	0	b
LSD P=.05		2.62		0.03		20.54	21	0.55		0.56).42
Standard Deviation		1.82		0.03		14.28		4.28		0.39		0.29
CV		08.10		31.61	•			1.65		67.10	692	

Discussion

The results of this trial provide further evidence of the large effect of varieties highly resistant to *G. pallida* can have on the pest population. The varieties Innovator, Elland, Eurostar, Buster, Amanda, and Karelia resulted in a Pi/Pf ratio of less than 1, thus the pest population was less after growing the crop than it was before. This effect is a powerful tool in the management of PCN populations. In contrast the production of highly, or partially resistant varieties (Cara, Maris Peer, Lanorma, and Tyson) resulting in large increases in the pest population at harvest (Pi/Pf ranging from 3.94 to 8.44).

It needs to be noted that of these varieties, Elland and Innovator have resistance only to *G. pallida* and not to *G. rostochiensis*. However, Eurostar, Buster, and Amanda can be considered resistant to both forms of PCN present in Scotland. The effect on a *G. rostochiensis* population was not assessed in this field trial as *G. rostochiensis* was not detectable at this site.

The initial population (Pi = 31.5 eggs per gram) can be considered moderate to high and in line with expectations. Nemathorin (Fosthiazate) treatment did not have an impact on the pest multiplication, and this was the case for all varieties. In situations such as this where Pi is relatively high, treatment with Nemathorin is unlikely to be effective in terms of population management. However, treatment with this product can protect the crop from the direct effects of feeding damage and a yield enhancement was observed. For resistant varieties, this difference in yield can provide an important measure of the tolerance of a variety to infection.

Maris Peer, Eurostar, Buster, Amanda, Cinderella, and Tyson all produced significantly higher yields when treated with Nemathorin than the untreated control plots. Thus, Eurostar, Buster, and Amanda while being fully resistant to *G. pallida*, were shown to be somewhat intolerant of infection. It is notable that for Cara, Elland, Karelia, and Lanorma the yield effect of Nemathorin treatments appeared to be positive, but small. Therefore, these results suggest that these varieties have a degree of tolerance to infection. In the case of Cara, included as a known susceptible and tolerant variety the result is in line with expectations.

Innovator, a widely grown variety, is known to show intolerance to PCN. However, in this trial there was a smaller effect than was expected. This may be due to a relatively high level of nitrogen fertiliser application (210kg/ka) which enabled the crop to develop better than expected under these conditions. In addition, tolerance assessment of varieties is known to produce variable results depending upon growing conditions, soil type, and pest pressure. Therefore, this set of results needs to be considered as the results of a single trial in a single year. Further work with a range of these varieties is planned for 2023.

The use of varieties with resistance to PCN, is central to the development of a sustainable production strategy for the potato crop in Scotland and the rest of the UK. Pressure to follow such a strategy will increase if further restrictions are made on the use of pesticides. However, the varieties must also be acceptable to the marketplace, and this also demonstrated that a selection of varieties, suited to the pre-packing sector, with resistance to *G. pallida*, is available to growers and supply chains in Scotland. The skin finish and other characteristics of the varieties in this trial were generally suited to this sector. Variety-specific agronomy protocols require refinement to ensure that the varieties are grown efficiently and maximise use of applied resources. Table 10 summarises the characteristics of the varieties in this trial.

<u>Table 10: Summary of variety performance</u>

Variety	Resistance to PCN G. pallida G. rostochiensis		Comments (related to this trial)	
Cara	2	9	Fully susceptible and tolerant control variety. Low yield due to short season.	
Maris Peer	2	2	Fully susceptible and tolerant control variety.	
Elland	9	3	Early maincrop with full resistance to <i>G. pallida</i> . Relatively tolerant. Moderate yield. Suitable for prepacking.	
Innovator	8	2	Second early with full resistance to <i>G. pallida</i> . Considered to be intolerant. Widely grown for French fry production. Skin finish is unsuitable for prepacking.	
Eurostar	9	9	Maincrop with dual resistance. Shown to be intolerant in this trial. Moderate yield. Suitable for prepacking and general use.	
Buster	9	9	Late Maincrop with dual resistance. Emergence delayed. Shown to be intolerant in this trial. High yield. Considered suitable for prepacking.	
Amanda	8	R	Medium early with dual resistance. Shown to be intolerant in this trial. High yield. Considered suitable for prepacking.	
Karelia	8	8	Medium early with dual resistance. Shown to be relatively tolerant in this trial. High yield. Considered suitable for prepacking.	
Cinderella	6	R	Early with partial resistance to <i>G. pallida</i> . Shown to be relatively tolerant in this trial. Lower yield. Considered unsuitable for prepacking due high dry matter content.	
Lanorma	5	9	Early maincrop with partial resistance to <i>G. pallida</i> and less suitable than fully resistant varieties in population management. Shown to be relatively tolerant in this trial. High yield. Suitable for prepacking.	
Tyson	4	1	Maincrop with partial resistance to <i>G. pallida</i> and less suitable than fully resistant varieties in population management. Shown to be intolerant in this trial. Moderate yield. Suitable for prepacking.	

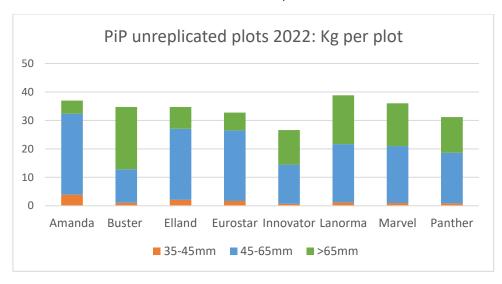
Acknowledgements

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Appendix: Potato in Practice demonstration 2022

Potatoes in Practice (11th August 2022) provided an opportunity to further engage with growers and supply chains on the production of *G. pallida* resistant varieties. A nonreplicated demonstration plot on a site with no recorded PCN was established for the purposes of demonstration. After the event, the plots were harvested and assessed. The results are presented below.



	Disease incidence %							
Variety	Common Scab	Powdery Scab	Black Scurf	Silver Scurf	Black Dot			
Amanda	2.5	0	3	25	7			
Buster	0.5	0.5	0	25	3			
Elland	1.0	0.5	0	8	25			
Eurostar	2.5	1.0	0	25	2.5			
Innovator	0	0	0	0.5	25			
Lanorma	1.5	2.5	0	25	2			
Marvel	3.0	0	0	3	25			
Panther	0	2.5	0	25	5			

Pictures of selected washed samples from Potato in Practice

