Salad Potato Technology Project

Crop Walk May 2016 (Workshop 3)

Workshop 3 will look at new varieties, test dig procedures, burn off, tuber fraction, blight control, pre-harvest storage actions, and others

3/23/2016

Method for test digging

- For each crop, you need to be clear what the size specification is
- Occasional examination of a few plants of each stock in a field on a weekly basis will provide an idea of when tubers are approaching the critical bulking stage (when largest tubers are within 5-10mm of top riddle size)
- Once this critical bulking stage has arrived, more intensive digs are required every 2-4 days.
- At least three locations for test digs should be selected at random from across the stock but avoiding any poor or unusual areas in the crop. One test dig per field is not enough as you may have chosen a poor area by chance. Two test digs per field will not give a good idea of the variation in the field. More than three digs will improve the information you get but takes up more time
- Repeat digs should take place close to these first intensive dig sites so that you are digging similar crop each time
- Ideally for each crop, each dig should comprise lifting at least 1m of drill and preferably 2m. Exact length of drill is not critical but it must be more than 1-2 plants to achieve a meaningful result.
- The minimum information from each dig is size of largest tuber but dividing the tubers lifted into appropriate size fractions will give the size distribution. Weighing the tubers in each fraction (especially the marketable fraction) adds an estimate of yield

Deciding when to carry out haulm destruction

- This will depend on your own view of what you are trying to achieve
- For example, a seed grower may decide to allow a proportion of tubers grow oversize to give him some ware to sell or cheap seed for next year
- For most crops the aim is to achieve the maximum number of tubers in the marketable fraction
- Some growers opt to allow the largest tubers to grow oversize on the basis that more of the under-size tubers will come into the marketable fraction
- However, larger tubers tend to be growing faster than small tubers and this approach does not always work. In any case some increase in size will occur during the process of haulm destruction (see below)
- Thus the most usual approach is to start haulm destruction when the largest tubers are at largest size in the marketable fraction in at least 2 of the 3 digs
- In a salad crop with a top riddle size of 42mm, the largest tubers should be at this size when haulm destruction starts. Only where there is a market for oversize tubers is it sensible to delay beyond this timing for haulm destruction

How much do tubers increase in size after haulm destruction starts

- There is no simple answer to this question as it depends on how rapidly tubers are growing, the soil conditions and the speed of haulm destruction
- However, experience suggests that if soil conditions are dry and uptake of nutrients and water limited, tubers may increase only 1mm (or at maximum 2mm) is size, irrespective of haulm destruction method

- If the soil is damp or wet, the increase in size depends on how rapidly haulm destruction is achieved. Experience suggests pulverising the haulm tends to restrict subsequent tuber growth better than chemical desiccation
- As a rough guide, when pulverisation starts the haulm destruction process, increase in tuber size is generally 1-2mm but with chemical desiccation is could be 2-3mm
- These are only guides but using test dig results where tubers are placed in size bands it is possible to approximately ascertain how many might move into oversize based on the method of haulm destruction used

Stuart Wale

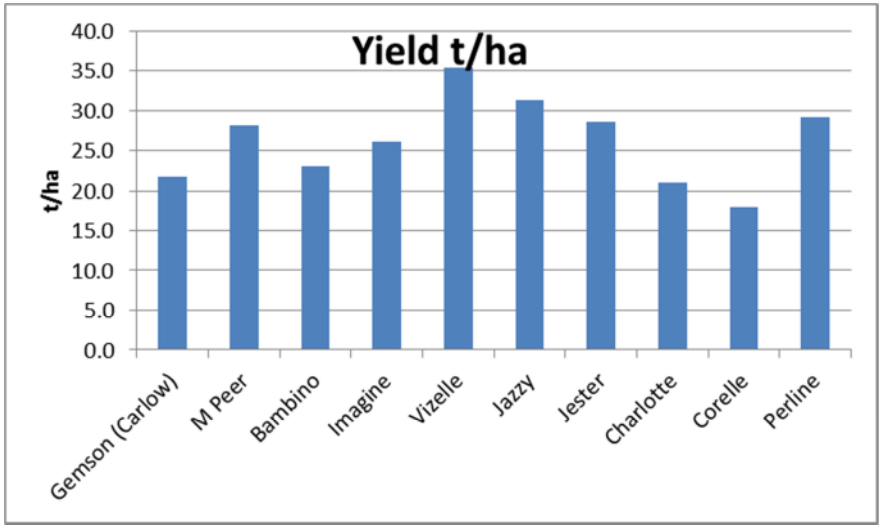
SRUC

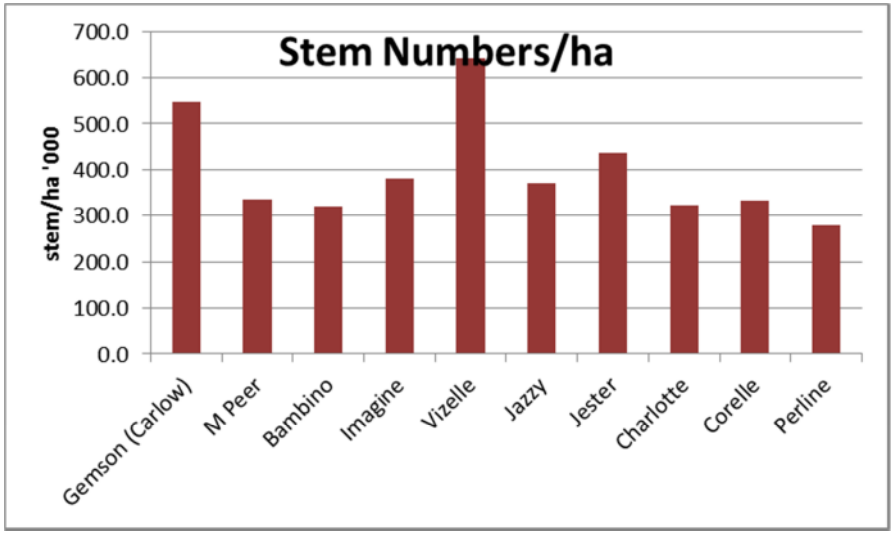
Field name	Roscat, Tullow
Soil type	Sandy Clay Loam
Soil analysis	Feb 2016
pH	6.0
P	12 mg/L (index 4)
K	119 mg/L (index 3)
Mg	304 mg/L
Copper	2.1 m/L
Manganese	127 mg/L
Zinc	1.8mg/L
Manure applied?	No
Fertiliser used	Broadcast NPK on ploughed land on salad area N= 110 kg/ha P= 45 kg/ha K= 190 kg/ha
Field history	
Last year potatoes grown?	Ploughed from grassland in 1998. Cereals last number of years
Previous crop? **Any groundkeepers?**	In 2015 Winter Barley followed by RVP Italian Ryegrass catch crop for store lambs
PCN? FLN?	Tested free of PCN March 2016
Stone content	Low stone content
Bed width	1.74m
Irrigation available?	Yes
De-stoner webs spacing	Grimme CS1500 – 35mm
Harvester webs spacing	Harvester Underhaug UN2200 – 25mm
Varieties in demo	See plan.
Market size requirement	25-42mm
Seed tuber count (tubers/50kg)	See below
Planned seed tuber spacing (inches) for 300,000stems/ac	
Seed quality	Planting notes: Bambino big seed. Vizelle some heel end rot. Jazzy long sprouts. Charlotte is our own breeders seed stock. Corelle big seed.
Seed tuber fungicide treatment	
Weed control	17-05-16 Sencorex 1.1 L/ha + Defy 4.0 L/ha + Retro 2.0 L/ha
Irrigation (20-25mmper application)	June 8th 08/06/16 July 6th 06/07/16 July 20th 20/07/16
Blight applications	Standard 7 day programme 3/6 Shirlan 0.4L/ha 9/6 Revus 0.6 l/ha 18/6 Revus 0.4l/ha

	24/6 Infinito 1.6 l/ha 30/6 Infinito 1.6 L/ha 6/7 Revus 0.6 L/ha 13/7 Revus 0.6L/ha 20/7 Infinito 1.6 L/ha

		<25mm				25-40mm (45mm)				>40mm(45mm)								
Variety	Spacing (inches)	Tuber no.	Tuber no/ha 000s	Wt (kg)	Yield (t/ha)	Tuber no.	Tuber no/ha 000s	Wt (kg)	Yield (t/ha)	Tuber no.	Tuber no/ha 000s	Wt (kg)	Yield (t/ha)	Total tuber no./ha 000's	Total yield t/ha	Stem number/ m	Stems/h a 000's	Tubers/ stem
Gemson (Louth)		160	444	0.44	1.2	348	967	7.48	**20.8**	20	55.6	1.41	3.92	1466.7	25.92	36	400.0	3.67
Gemson (Cork)		21	58	0.15	0.4	183	508	3.9	**10.8**	33	91.7	2.25	6.25	658.3	17.50	96	1066.7	0.62
Gemson (Wexford)		74	206		0.0	598	1661		**28.9**	4	11.1			1877.8	28.90	56	622.2	3.02
Gemson (Donegal)						320	889							888.9		40		
Gemson (Carlow)	6	91	253	0.6	1.7	240	667	7.55	**21.7**	21	58.3	1.35	3.9	977.8	27.30	49.25	547.2	1.79
M Peer	6	39	108	0.25	0.7	250	694	9.8	**28.2**	28	77.8	3.15	9.1	880.5	37.93	30.25	336.1	2.62
Bambino	6	11	31	0.1	0.3	196	544	8	**23.0**	40	111.1	3.7	10.6	686.1	33.91	28.75	319.4	2.15
Imagine	6	25	69	0.15	0.4	227	631	9.1	**26.1**	34	94.4	2.85	8.2	794.4	34.77	34.25	380.6	2.09
Vizelle	5	157	436	2.05	5.9	315	875	12.3	**35.3**	0	0.0	0	0.0	1311.1	41.23	57.75	641.7	2.04
Jazzy	7	49	136	0.35	1.0	240	667	10.9	**31.3**	9	25.0	0.95	2.7	827.8	35.06	33.25	369.4	2.24
Jester	7	164	456	1.2	3.4	337	936	9.95	**28.6**	25	69.4	2.05	5.9	1461.1	37.93	39.25	436.1	3.35
Charlotte	6	23	64	0.2	0.6	169	469	7.3	**21.0**	37	102.8	4.65	13.4	636.1	34.91	29	322.2	1.97
Corelle	6	23	64	0.15	0.4	115	319	6.25	**18.0**	92	255.6	11	31.6	638.9	50.00	30	333.3	1.92
Perline	9	49	136	0.4	1.1	300	833	10.15	**29.2**	42	116.7	3.1	8.9	1086.1	39.22	25	277.8	3.91
M Peer(Donegal)			0		0.0	280	778		**0.0**		0.0		0.0	777.8		51	566.7	1.37
M Peer (Cork)		45	125	0.4	1.1	89	247	3.8	**10.6**		0.0		0.0	372.2		67	744.4	0.50
Bambino(Donegal)			0		0.0	294	817		**0.0**		0.0		0.0	816.7		51	566.7	1.44
Jester (Cork)		120	333	1.9	5.3	175	486	4.2	**11.7**	3	8.3	0.25	0.7	827.8		122	1355.5	0.61

Carlow Yields and stem numbers





Bambino

Scottish Seed Stocks
English Seed Stocks

Tubers have poor resistance to splitting and some resistance to bruising. Trials have found good resistance powdery scab.. This variety has low resistance to silver scurf. Tests for resistance to potato cyst nematode demonstrated resistance to *Globodera rostochiensis* Ro1 and susceptibility to *Globodera pallida* Pa 2/3, 1.

Parentage	**Navan x Boxer**
Breeder	Cygnet PB Ltd
Breeder Agent	Cygnet PB Ltd
Breeder Rights (expiry)	not set

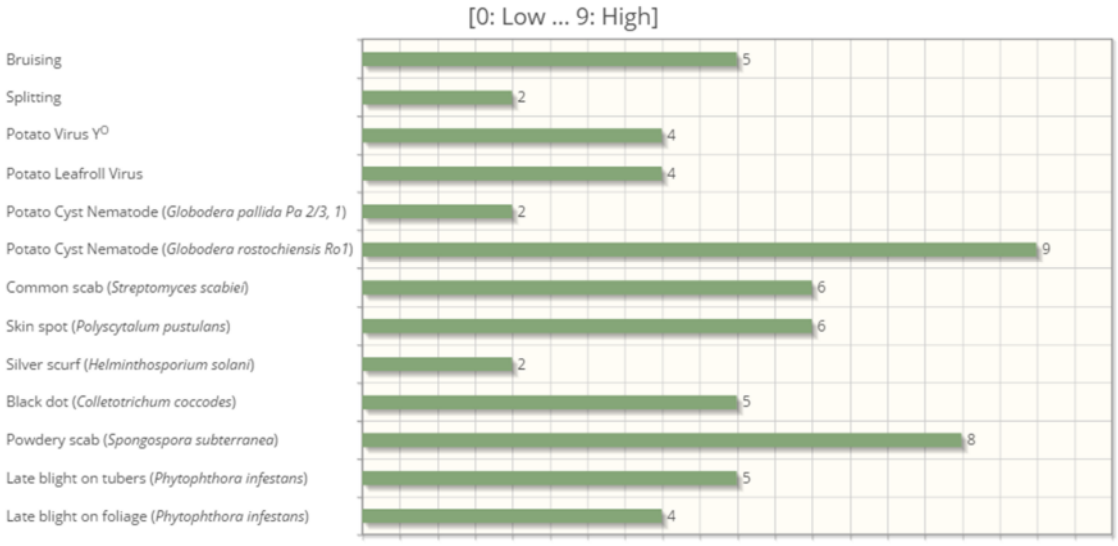
Images

Characters

Tuber Characteristics	
Shape of tuber	Short - oval
Colour of skin	White
Colour of flesh	Cream
Depth of eyes	Shallow - medium
Smoothness of skin	Smooth

Botanical Description	
Colour of base of lightsprout	Absent
Maturity	Maincrop
Height of plants	Medium
Frequency of berries	Absent

Resistance to Damage, Pests and Diseases.



Results of National List or AHDB Potatoes Independent Variety Trials

Maris Peer

Scottish Seed Stocks
English Seed Stocks

Second early maturity producing moderate yields of very uniform sample. Good resistance to powdery scab, gangrene, damage, bruising and skin spot. Moderately susceptible to drought, potato virus Yo, spraing and slug damage. Susceptible to potato cyst nematode *Globodera rostochiensis* Ro1 and *Globodera pallida* Pa2/3,1. Medium/low dry matter, firm cooked texture, good boiling quality.

Parentage	**120/13 x Ulster Knight**
Breeder	Plant Breeding Institute
Breeder Agent	GB Seed Industry
Breeder Rights (expiry)	not set

Images

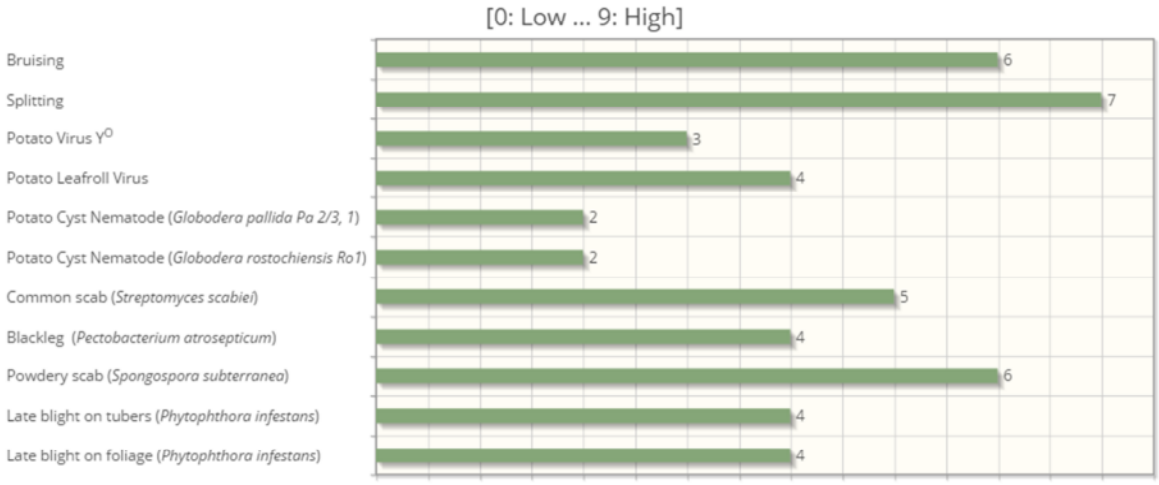



Characters

Tuber Characteristics	
Shape of tuber	Oval
Colour of skin	Cream
Colour of flesh	Cream
Depth of eyes	Shallow - medium
Smoothness of skin	Smooth

Botanical Description	
Colour of base of lightsprout	Pink
Maturity	Second Early
Height of plants	Medium
Colour of flower	Red violet
Frequency of berries	Few

Resistance to Damage, Pests and Diseases.



Results of National List or AHDB Potatoes Independent Variety Trials

JESTER

Scottish Seed Stocks
English Seed Stocks

Tubers have some resistance to splitting and good resistance to bruising. Trials have found good resistance to powdery scab, common scab and potato virus a.. This variety has low resistance to dry rot and potato leafroll virus.. Tests for resistance to potato cyst eelworm demonstrated susceptibility to both *Globodera rostochiensis* Ro1 and *Globodera pallida* Pa 2/3, 1.

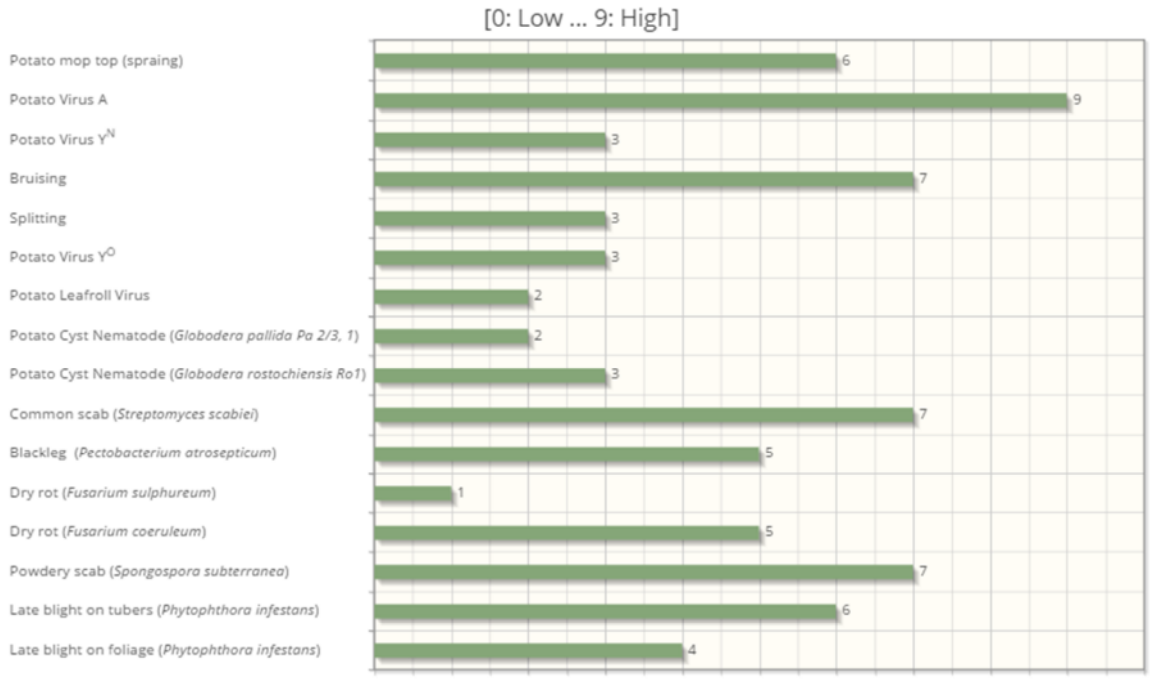
Parentage	**Vales Emerald x 1288 AF 23**
Breeder	Scottish Crop Research Institute
Breeder Agent	Greenvale AP
Breeder Rights (expiry)	not set

CHARACTERS

TUBER CHARACTERISTICS	
Shape of tuber	Short - oval
Colour of skin	White
Colour of flesh	Cream
Depth of eyes	Shallow

BOTANICAL DESCRIPTION	
Colour of base of lightsprout	Violet
Maturity	Second Early
Height of plants	Short - medium
Colour of flower	Red violet

RESISTANCE TO DAMAGE, PESTS AND DISEASES.



Results of National List or AHDB Potatoes Independent Variety Trials

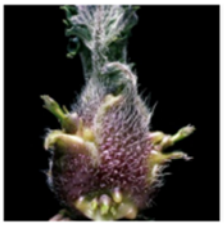
Charlotte

Scottish Seed Stocks
English Seed Stocks

Second early maturity, producing moderate yields of uniform, smooth skinned tubers. . Medium dry matter, waxy cooked texture. Susceptible to late blight on foliage, potato cyst nematode *Globodera rostochiensis* and *Globodera pallida* . Tests show resistance to Blackleg.

Parentage	**Hansa x Danae**
Breeder	Unicopa
Breeder Agent	GB Seed Industry
Breeder Rights (expiry)	not set

Images

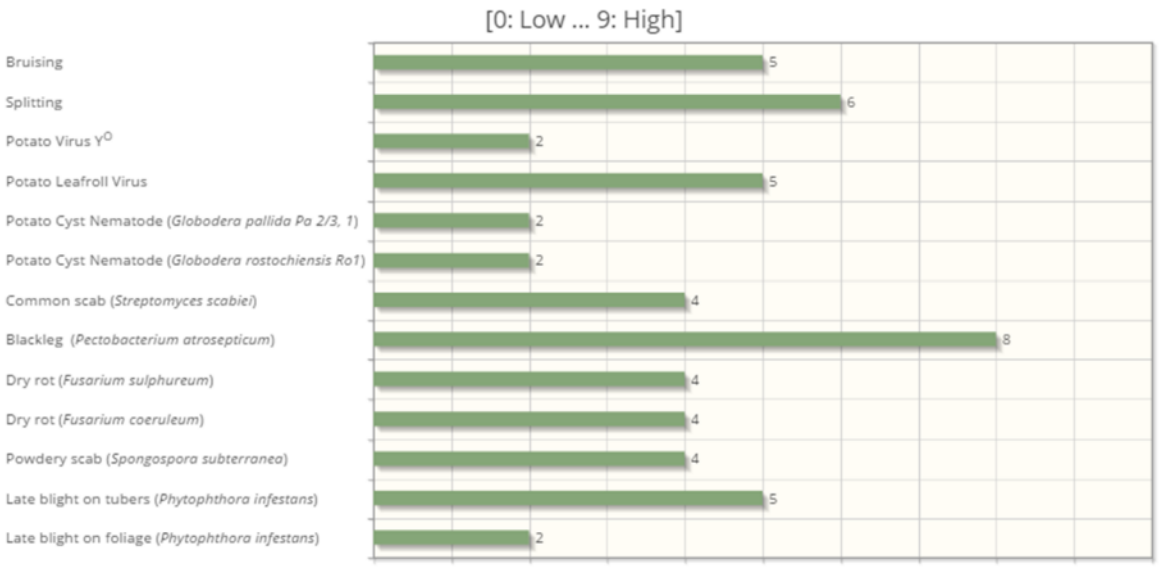




Characters

Tuber Characteristics	
Shape of tuber	Oval - long
Colour of skin	Cream
Colour of flesh	Light yellow
Depth of eyes	Shallow
Smoothness of skin	Smooth

Botanical Description	
Colour of base of lightsprout	Pink
Maturity	Second Early
Height of plants	Medium
Colour of flower	Red violet
Frequency of berries	Few

Resistance to Damage, Pests and Diseases.



Results of National List or AHDB Potatoes Independent Variety Trials

Growers - Varieties - Perline

Breeding & licensing

Breeder:	KWS
Licensed Territory:	UK & EIRE

Field Characteristics

Tuber Yield:	Good
Tuber Number:	Very High
Tuber Shape:	Round Oval
Dry Matter:	Moderate
Flesh Colour:	Pale Yellow
Eye Depth:	Shallow
Dormancy:	Short (3)
Wart Disease:	Resistant
Bruising:	7*
Black Dot:	-

Disease Resistance

Foliage Blight:	4*
Tuber Blight:	6*
Blackleg:	-
Common Scab:	5*
Powdery Scab:	-
Potato Leaf-Roll Virus:	-
Virus Y:	4*
PCN RO1:	Resistant
PCN G.Pallida:	Susceptible
Spraing:	-

Perline

Perline is a high tuber number early variety delivering an exceptional new season potato experience for the consumer.

Successfully launched as the UK follow on from Jersey Royal potatoes, Perline is an attractive option for growers as well as consumers. Tuber initiation is very quick, often occurring as the plants emerge, meaning scab control needs to be prompt.

Foliage production is moderate as the variety puts its energy into bulking the high number of tubers. Perline has demonstrated consistent yields through sequential planting to meet customer's
fluffy skin supply programmes. Harvesting straight from the green top is easy compared to many varieties and has good resistance to bruising. Dormancy is short and so seed management to maximise stem production is relatively easy.

- Early New Potato
- Outstanding flavour
- Exceptional high tuber number
- Resistant to PCN RO1

GEMSON

Scottish Seed Stocks
English Seed Stocks

Tubers have good resistance to splitting. Trials have found good resistance to powdery scab, blackleg, silver scurf and potato leafroll virus. This variety has low resistance to dry rot *Fusarium sulphureum* and *Fusarium coeruleum* , Bruising and late blight on tubers. Tests for resistance to potato cyst nematode demonstrated susceptibility to both *Globodera rostochiensis* Ro1 and *Globodera pallida* Pa 2/3, 1.

Parentage	**SCRI.85.C.4d.8 x Maris Peer**
Breeder	Scottish Crop Research Institute
Breeder Agent	Grampian Growers
Breeder Rights (expiry)	2037

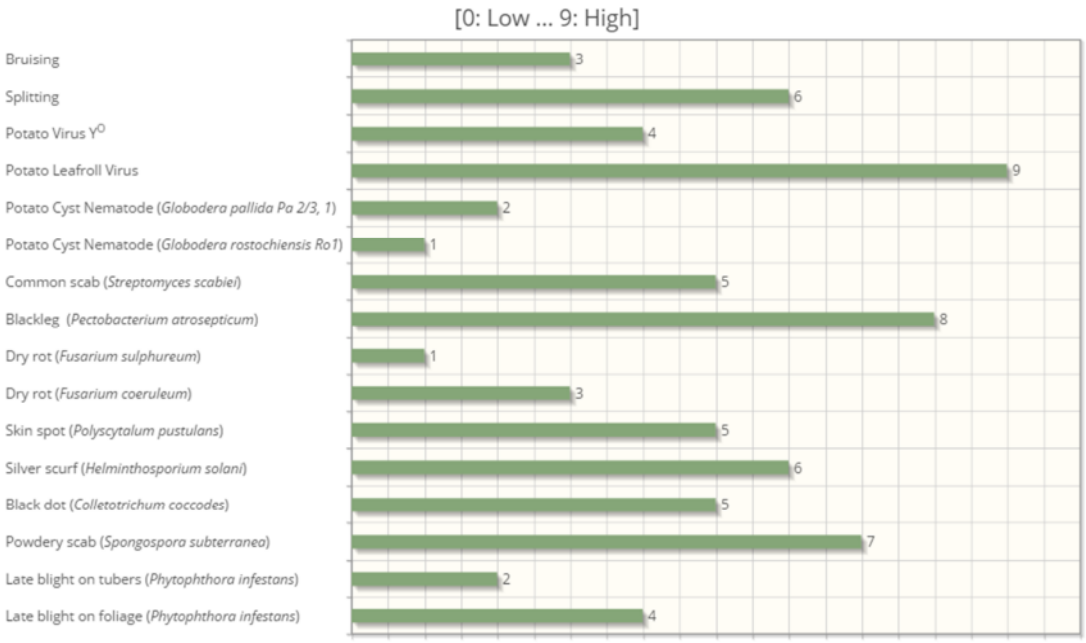
IMAGES

CHARACTERS

TUBER CHARACTERISTICS	
Shape of tuber	Short - oval
Colour of skin	White
Colour of flesh	Cream
Depth of eyes	Shallow - medium
Smoothness of skin	Smooth

BOTANICAL DESCRIPTION	
Colour of base of lightsprout	Pink
Maturity	Second Early
Height of plants	Medium
Colour of flower	Red violet
Frequency of berries	Medium

RESISTANCE TO DAMAGE, PESTS AND DISEASES.



Results of National List or AHDB Potatoes Independent Variety Trials

Jazzy

TABLE STOCK POTATOES

Characteristics	
Maturity	8.0
Colour of skin *(1)	LG
Colour of flesh *(2)	6
Shape of tuber *(3)	L
Depth of the eyes	8
Tuber uniformity	7
Size of tubers	3
Grading	8
Dry matter percentage	19
Suitability for cooking	8A
Dormancy	1

Comments
9=positive ... 1=negative
*(1): L=light D=dark W=white G=yellow R=red
*(2): Colour of flesh: 8=yellow ... 4=white
*(3): Shape of tuber: R=round O=oval L=long

Description

Jazzy is very suitable as a salad potato. It is also a productive variety, in the number of tubers per plant as well as the yield per hectare. Jazzy has a cooking type A with an excellent taste and a good texture. The bruising index can be considered to be very low, which adds to the internal quality. Jazzy is easy to grow.

Storage

°C 4
6 months

Resistance	
Leaf rol	7
A-virus	7
X-virus	8
Y-virus	6
Yntn-virus	7
Foliage blight	3
Tuber blight	
Common scab	7
Spraing	8
Bruising	9
Secondary growth	7
Ro1	3
Ro2/3	
Pa2	
Pa3	
wz 1 (D1)	10
wz 2/6 (G1/O1)	9
wz 18 (T1)	

R=resistant ... 1=very susceptible
Ro/Pa(x) = Globodera rostochiensis / pallida pathotype(x)

RESISTANCE TO GOLDEN NEMATODE:
Ro1(=A), Ro2/Ro3(=BC), Pa2(=D), Pa3(=E)
(9 = high resistant; 1 = very susceptible)
WART DISEASE:
wz 1(D1), wz 2/6 (G1/O1, wz 18 (T1)
(10 = resistant, 3 = very susceptible)

Vizelle

Origin

Breeder	Cygnet PB
Parentage	Appelle x D49-1)
National List Trials	2012 and 2013
Plant Breeders Rights	2014

Botanical Features

Maturity	Maincrop
End Use	Baby/New/Salad
Haulm	
Flowers	
Tubers	Oval tubers, cream skin, light yellow flesh

Resistance to damage, pests and diseases

Foliage blight	4	TRV (Spraing)	1
Tuber blight	2	Leafroll	4
Blackleg	6	Virus Y	3
Common scab	8	Skin Spot	9
Powdery scab	6	Black Dot	5
G.Pallida Pa 2/3,1	3	Dry Rot (F. coeruleum)	5
G.Rostochiensis Ro1	9	Dry Rot (F. sulphureum)	1
PVA	4	Silver Scurf	8
Mop Top (Spraing)	9	Bruising	5
		Splitting	2

Vizelle pdf

Consumer Quality

Primarily targeted at the salad/baby market Vizelle produces oval tubers with a light yellow flesh. Vizelle has a pleasant waxy texture with good taste and no break-down after boiling.

Agronomic Features

Vizelle produces exceptionally high tuber numbers with high yields of tubers in the 20 x 42 mm size band with little over-size. Resistant to Ro1.

Corolle

Cross: Chloe x G81TT155.1

Agronomy guide

Corolle general description

- First early new/salad variety that produces good yields of uniform smooth skinned tubers
- Pale yellow skin and flesh colour
- Medium dry matter with a waxy cooked texture and a very good eating quality
- Good resistance to foliage blight and blackleg
- Good tuber numbers giving moderate yields
- Previously held the TI category with the Co-op for the past 10 years and was challenged annually but beat all competition for taste

Breeder: Germicopa, France

Field characteristics	Corolle
Tuber yield	Moderate
Tuber number	High
Tuber shape	Long oval
Dry matter	18-19%
Flesh colour	Pale Yellow
Dormancy	High
Drought resistance	Moderate
Bruising susceptibility	Moderate
Damage susceptibility	Moderate
Nitrogen group RB209	2

Disease resistance	Corolle
Foliage blight	6
Tuber blight	5
Blackleg	6
Common scab	6
Powdery scab	5
Black dot	5
Leaf roll virus	5
Virus Y	5
Cyst nematode Ro1	Resistant
Cyst nematode Pa2,3	Susceptible

Why use a SMART Test

Haulm destruction after prolonged periods of dry weather, when the soil is dry and crops are stressed, can lead to tuber damage. In these conditions vascular staining may be exacerbated by rapid haulm destruction achieved by mechanical or chemical methods.

It is primarily designed for use with split dose application REGLONE treatments, but may also be used in conjunction with the label recommendations for a single dose application where high Soil Moisture Deficits prevail. The SMART test allows you to evaluate when there is sufficient moisture in the soil for the application of REGLONE. It is a simple in-field test that will quickly indicate whether it is safe to desiccate with full rate REGLONE, a reduced rate split application or, in some cases, to use an alternative method.

How to do the SMART test

1. Take a spade out into the field.

2. Be prepared to test at several points. Take particular care with known dry areas and any areas where the crop has senesced more than the remainder.

3. Dig down and take soil sample from the centre of the ridge 5 cm below the lowest tuber.

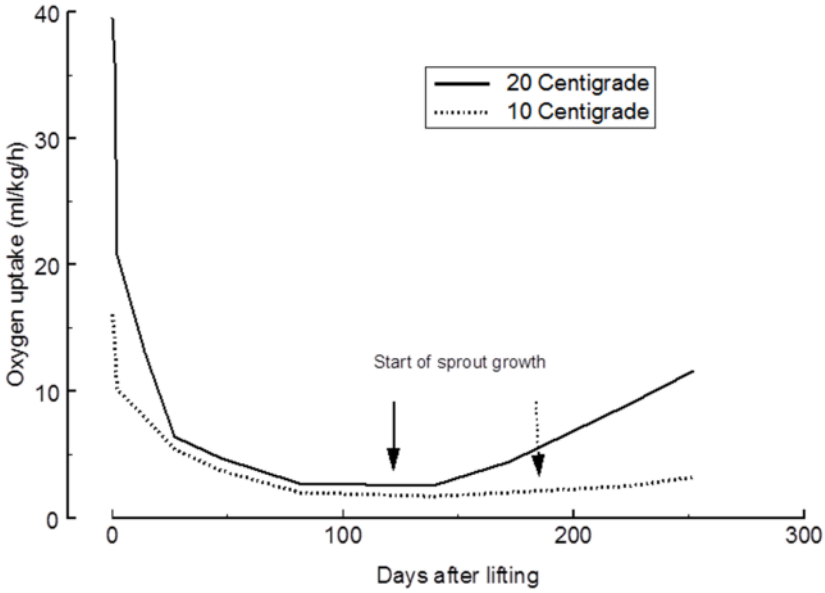
4. Gently squeeze the soil sample into a ball with one hand. If it is sufficiently moist it will remain as a ball . If it collapses then it is too dry for REGLONE.

Treat with REGLONE within 24 - 72 hours of a positive SMART test

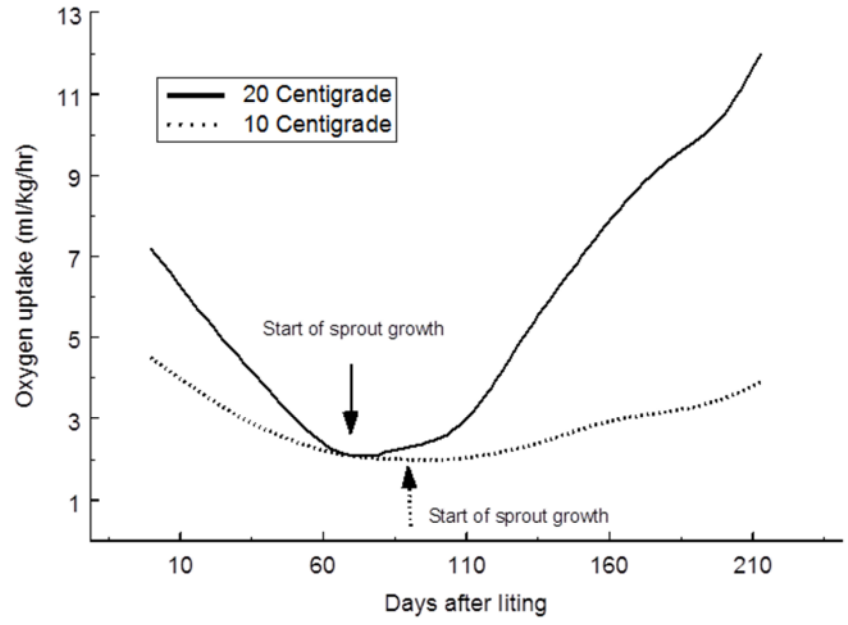
Respiration after harvest

The two graphs below are taken from Burton (1974) and show the respiration rate, expressed as oxygen uptake, with time after harvest for immature (un-set skin) and mature (set-skin) potatoes when placed in storage at 10°C and 20°C. It takes a long time for respiration to slow down. Thus at harvest ventilation needs to remove the heat resulting from respiration to avoid condensation and to remove CO_2

Immature potatoes



Mature potatoes



Potato Fungicides 2016

Product Name	Active Substance	Mode of Action	Rate/Ha	RRP (ex VAT)	Marketing Company	Water Vol.	Application Interval	PHI	Max Total Dose	Max No Appns per crop	Curative	Leaf Blight	Rain Fastness	New Growth
Amistar Opti/Curator *(off label)*	Chlorothalonil 400 g/l Azoxystrobin 80g/L	Contact + Systemic	1.25 - 2.5 L	€96/5L	Syngenta	200-300	7 - 10 days	7 days	5.0l/ha	2	-	-	-	-
Vertik *(off label)*	Chlorothalonil 500 g/l Azoxystrobin 100g/L	Contact + Systemic	0.8 L	€115/5L	Syngenta	200-300	7 - 10 days	7 days	2.4 L/ha	-	-	-	-	-
Dithane 945	Mancozeb 80 %w/w	Contact	2.25 kg	TBA/ 25kg	Whelehans	200 – 1000	7 days	7 days		Not Specified	0	2		1.5*
Penncozeb WDG, Dithane NT	Mancozeb 750 g/kg	Contact	2.1 kg	€65+/10 kg	Unichem /Whelehans	200 - 1000	7 - 14 days	7 days	16.8kg/ha	8	0	2		11/2*
Ranman Top	Cyazofamid 160 g/l	Contact	0.5 L/ha	€150/5L	Whelehans	200 – 400	5 days	7 days	3.0L	6	0	3.8	3*	2*
Shirlan/Tizca/ Volley/Farmco Blitz	Fluazinam 500 g/l	Contact	0.4L/ha	€33+/1L	Syngenta/DHM / Croplink/Farmco	200-500	7 days	7 days	4lt/Ha	10	0	2.9	2.5*	-
Ridomil Gold MZ 68 WG	Mancozeb 64 %w/w + Metalaxyl M 4.0 %w/w	Systemic + Contact	2.5 kg	€113/5kg	Syngenta	200	10 - 14 days	7 days	7.5 kg/ha	3	2.5*	-	3*	2*
Epok	Metalaxy-M 193.6 g/l Fluazinam 400 g/l	Systematic	0.5 l/ha	€98/1lt	Whelehans	200-400	7 days		1.5l	3	2.5*	-	3*	2*
Option	Cymoxanil 600 g/kg	Translaminar (Tank Mix partner only)	187g/ha	€92/1.5kg	DuPont	200 – 500	7 – 10 days	14 days	1.125 kg/ha	6	-	-	-	-
Cymbal	Cymoxanil 45% ww	Translaminar (Tank Mix partner only)	0.25 kg/ha	€37.5/1kg	Whelehans	200	7 – 10 days	14 days	1.5kg	6	-	-	-	-
C50 WG	Cymoxanil 500g/kg	Translaminar (Tank Mix partner	.24/kg	€32/1kg	Unichem	200	7 days		.95kg	4	-	-	-	-
Revus	Mandipropamid 250 g/l	Translaminar + Contact	0.6lt	€259/5L	Syngenta	200	7-10 Days	3 Days	2.4 L/ha	4	1*	5	3*	2*
Curzate M WG/ Moximate	Cymoxanil 4.5 % w/w + Mancozeb 68 %w/w	Translaminar + Contact	2.5 kg	TBA/10 kg	DuPont	200	10 – 14 days	7 days	16 kg/ha	6	-	-	2*	-
Zetanil WG	Cymoxanil 45g/kg + Mancozeb 650 g/kg	Translaminar + Contact	2.4kg	€73/10kg	Unichem	300	7 days	7 days	19.2kg/ha	8	2*	-	2*	-
Proxanil	propamocarb 400g/l + cymoxanil 50g/l	Translaminar + Contact	2.5 l	€108/10l	Unichem	400	7 days	-	15 L/ha	6	2.5*	-	-	-
Infinito/ Farmco Blight	Propamocarb 625 g/l + Fluopicolide 62.5 g/l	Translaminar+ systemic	1.6 L/ha	€175+/10L	Bayer/Farmco	200-400	7 days	7 days	6.4 L/ha	4	2*	3.8	2*	2*
Consento	Propamocarb 375 g/l + Fenamidone 75 g/l	Translaminar	2L/ha	€168/10L	Bayer	200-400	7 days	7 Days	12Lt/Ha	6	2*	2.5	3*	1.5*
Valbon	Benthiavalicarb 17.5 g/kg + mancozeb 700 g/kg	Translaminar + Protectant	1.6 kg/ha	€150/9.6kg	Whelehans	200-400	7 – 10 days	7 days	9.6 kg/ha	6	1*	3.7	2*	-

Note Euro Blight 2016 (Green) 1*=reasonable effect; 2*=good effect; 3*=v good effect