Grower Summary

FV 348d

Onions - Independent assessment of field and storage potential of varieties

Annual 2017

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Project title:	Onions - Independent assessment of field and storage potential of varieties
Project number:	FV 348d
Project leader:	Bruce Napier, NIAB
Report:	Annual Report
Previous report:	
Key staff:	Bruce Napier Shaun Coleman
Location of project:	NIAB, Cambridge Drilled trials: Essex and Norfolk
Industry Representative:	Tom Will, VCS
Date project commenced:	01 April 2015
Date project completed (or expected completion date):	30 July 2018

GROWER SUMMARY

Headline

- New varieties add positively to the choices available to growers offering excellent storage potential; a broader range of red varieties; and mildew resistance.

Background

The aim of the work is to provide independent assessment of the growing habits, yield, quality and storage potential of new onion varieties propagated from sets and seed. There are direct comparisons of new and established varieties and growers have the opportunity to inspect the trials at key stages.

Plant breeders continue to develop improved varieties with characteristics that meet grower requirements e.g. high yield, disease resistance, good quality and storability.

Set onions account for approximately 30% of the area grown in the UK. Early maturing varieties such as Jagro are favoured to give an early harvest while the Sturon types mature later but can be stored until Christmas. Red Baron still commands a large percentage of the red area.

Drilled onions account for approximately 70% of the area grown in the UK. Early maturing varieties such as Hybing, Hybound, Centro and Vision are popular. New material is competing to take a share of the early maturing variety market. Maincrop and late maturing varieties still hold a large proportion of the acreage e.g. varieties such as Hytech and Armstrong are still important in extending the harvest window. Red Baron still commands a large but diminishing percentage of the red area with Redspark, Red Tide and Retano gaining popularity.

Overwintered onions are still grown on a small scale but there are not enough varieties to warrant evaluation trials.

Results of the Variety Trials

Results – Set Onions

Trial records and data collected – onion trials planted from sets

Table A shows key areas of interest – maturity, marketable yield and storage data.
A full set of data tables is appended to the full report.

Trial site details

Sites were agreed with AHDB Horticulture/BOPA through a steering group, storage was at NIAB in an ambient store.

The trials were hosted by (with thanks) and located as follows:

- A W Mortier Farms, nr Leiston, Suffolk - set onions
- R Oldershaw Farms, nr Weston, Lincolnshire – set onions

The trials were planted between 4th Feb. and 21st March (Suffolk) and 16th Feb. and 22nd March (Lincs).
The trials were harvested on 18th July and 19th Aug. (Suffolk) and 3rd Aug. (Lincs).
The season started slowly but it was generally fairly mild.
Mildew was not a problem in the trials – it came in late at low levels of infection when the crops were maturing.
A severe hail storm stopped the Lincs trial developing fully and impacted both yield and storage results.

Table A. NIAB Spring Sown Onion Trials from sets 2016 – Varieties, Maturities, Yield & Storage

Varieties in maturity order (mean of both sites); Main 3 replicates; *Preliminary 2 replicates of data*

			Maturity	marketable yield	Ambient Storage
Variety	set source	Seed source	Date of 80% foliage fallover	(t/ha)	% sound bulbs at end April
Early Browns			Suffolk	Mean	Suffolk
Troy	Bejo/DGS	Bejo/De Groot en Slot	06-Jul	35.7	-
Alpha	Allium Seeds	*Allium Seeds UK Ltd*	08-Jul	24.9	-
Vulcan200	*Allium Seeds*	*Allium Seeds UK Ltd*	*08-Jul*	*38.5*	-
Spitfire	Allium Seeds	Allium Seeds UK Ltd	09-Jul	38.5	-
Forum	Bejo/DGS	Bejo/De Groot en Slot	10-Jul	27.4	-
Griffon	Allium Seeds	*Allium Seeds UK Ltd*	17-Jul	56.7	-
Jagro	English Set Company	Bejo/De Groot en Slot	20-Jul	57.0	
Contado	*English Set Company*	*confidential*	*01-Aug*	*38.4*	
Early Reds					
ABS 240	*Allium Seeds*	*Allium Seeds UK Ltd*	*09-Jul*	*38.4*	
Maincrop Browns					

Rumba	Allium Seeds	Allium Seeds UK Ltd	02-Aug	56.5	41
Sturon	English Set Company	Confidential	05-Aug	55.3	31
Hercules	Bejo/DGS	Bejo/De Groot en Slot	04-Aug	40.1	11
Contado	*English Set Company*	*Confidential*	*03-Aug*	*34.7*	23
VCS 6004	English Set Company	Confidential	02-Aug	42.8	35
VCS 6005	English Set Company	Confidential	05-Aug	47.3	23
SturBC20	Bejo/DGS	Bejo/De Groot en Slot	09-Aug	39.7	2
					24
Maincrop Reds					
Red Baron	Broer/Elsoms	Bejo/De Groot en Slot	04-Aug	43.1	12
Red Light F1	Broer/Elsoms	Bejo/De Groot en Slot	08-Aug	29.5	0
Red Ray F1	Broer/Elsoms	Bejo/De Groot en Slot	10-Aug	30.6	31

The following varieties are of most interest to the industry. Full information on all varieties can be found in the 'Full Trial Report'.

Sets still attract a premium as they are earlier to market than drilled crops and fill a gap when stores are becoming empty.

For organic growers and for high disease pressure years the mildew resistant varieties offer potential – Santero was not in trial but commercially does well in areas where mildew is a problem.

There is a good range of maturities allowing growers to spread their harvest period.

Establishment was good if a little slow to get started. Set availability was a problem and some of the early material was not planted until later which will have reduced the benefit of them potentially maturing early, but they were still almost 4 weeks earlier.

Spitfire, Griffon, Troy and Sturon all had good early vigour.

Alpha, Spitfire, Troy and ABS240 were the earliest maturing varieties. There was not much spread of maturities in the main crop varieties.

Very little mildew was seen and this only came into crops in July so there was little damage seen.

Jagro and Griffon were the highest yielding brown earlies. Rumba and Sturon were highest yielding of the brown maincrop varieties. Red Baron was the highest yielding red.

Troy, Alpha, Vulcan and Forum had the best neck finishes.
Skin quality was generally poorer on the earlier maturing varieties but of these Contado and Jagro had the best skin finishes of the early material.

Early material tends not to be suitable for storage and are thus not recorded.
Of the brown maincrop varieties Rumba and VCS6004 had the highest percentage of sound bulbs in April. Red Ray was the best of the reds.

There were many bacterial rots in the Lincs harvested material due to the hail damage. This was carried through into storage and Penicillium rots were also seen at high levels. The Suffolk trial had very low levels of rots at harvest but also saw higher than normal levels of bacterial rots in storage.

Results – Drilled Onions

Trial records and data collected –onion trials drilled from seed

Table B shows key areas of interest – maturity, marketable yield and storage data.
A full set of data tables is appended to the full report.

Trial site details

Sites were agreed with AHDB Horticulture/BOPA through a steering group, storage was at NIAB in an ambient store and at P G Rix in commercial CE store.

The trials were hosted by (with thanks) and located as follows:

- J Raker Farms, Croxton, Norfolk – drilled onions
- P G Rix Farms, nr Colchester, Essex – drilled onions

The trials were harvested on 2nd September (Norfolk) and 8th September (Essex). The 2016 season maturities were approx 3 days earlier than the 10 year averages while 2015 season was 1 week earlier than the average. Establishment conditions were good and the season as a whole didn't have too many extremes of temperature.
Mildew was a major problem in both trials.

Table B. NIAB Spring Sown Onion Trials drilled from seed 2016 – Varieties, Maturities, Yield & Storage

Varieties in maturity order (mean of both sites); Main 3 replicates; *Preliminary 2 replicates of data*

Variety	Source	Maturity Date of 80% foliage fallover	Yield marketable (t/ha)	Ambient Storage % sound bulbs at end May	CE Storage % sound bulbs at end July
BROWNS					
Euresco	*Hazera*	*17-Aug*	63.6	9	6
Drytan	*Bejo/DGS*	*19-Aug*	69.2	53	61
Hybound	Bejo/DGS	20-Aug	71.1	38	40
Hytech	Bejo/DGS	20-Aug	82.8	19	35
Hybing	Bejo/DGS	21-Aug	78.7	32	43
RS 07751481	Seminis	21-Aug	77.2	17	12
Hypark	Bejo/DGS	22-Aug	71.0	23	25
Hytune	*Bejo/DGS*	*22-Aug*	82.1	35	66
SV3557ND	Seminis	22-Aug	72.9	38	33
SVND 0363	*Seminis*	*23-Aug*	68.8	32	60
Vision	Syngenta	24-Aug	73.3	37	43
Ceresco	*Hazera*	*24-Aug*	55.0	19	26
Rockito	Seminis	25-Aug	71.9	29	16
SV8528ND	Seminis	25-Aug	73.6	33	38
Manesco	*Hazera*	*25-Aug*	57.8	20	23
Paradiso	Hazera	28-Aug	69.7	45	24
Centro	Hazera	28-Aug	74.8	26	18
SVND 0367	*Seminis*	*28-Aug*	65.2	46	54
Medaillon	Syngenta	28-Aug	71.7	47	60
Sanjato (37-1003)	*Hazera*	*30-Aug*	72.7	42	22
Motion	Syngenta	30-Aug	76.2	41	36
Hyfive	*Bejo/DGS*	*30-Aug*	71.9	23	39
Hyway	*Bejo/DGS*	*30-Aug*	71.1	47	60
Hysky	Bejo/DGS	31-Aug	71.1	47	64
SV1332ND	Seminis	31-Aug	72.6	24	17
Chico	Hazera	02-Sep	68.1	49	43
Santero	Hazera	03-Sep	72.5	21	14
Means		**26-Aug**	**71.4**	**33**	**36**
Red Light	Bejo/DGS	17-Aug	76.0	10	34
AF 219	*Allium Farms*	*19-Aug*	62.3	53	46
Red Planet	*Allium Farms*	*19-Aug*	58.4	25	14
AF 111	*Allium Farms*	*21-Aug*	56.9	23	34
AF 222	*Allium Farms*	*23-Aug*	55.0	36	21
Retano	Hazera	24-Aug	58.8	21	36
AF 175	*Allium Farms*	*25-Aug*	62.9	66	50

Red Tide	Bejo/DGS	25-Aug	63.1	41	72
Redspark	Bejo/DGS	28-Aug	61.2	25	25
Red Baron(A)	Allium Seeds	30-Aug	62.1	25	30
37-110	Hazera	02-Sep	50.0	19	11
Red Baron(E)	Bejo/DGS	02-Sep	63.8	27	31
ABS 212 F1	Allium Seeds	02-Sep	58.2	43	36
Means		**25-Aug**	**60.7**	**32**	**34**

The following varieties are of most interest to the industry. Full information on all varieties can be found in the 'Full Trial Report'.

There is a good range of maturities allowing growers to spread their harvest period. However, in cooler years, such as 2013, the opportunities to harvest later maturing varieties can run over into October which can result in bulbs being harder to dry.

For organic growers and for high disease pressure years the mildew resistant varieties offer potential – Santero was the highest yielding variety on the mildew affected Norfolk site in 2014 – both of the 2016 trials had significant levels of mildew.

Establishment was good. Seed beds were generally of a good quality; cold temperatures in March and April meant that growth was slow; Early summer temperatures were cooler than in 2015 and then wet conditions allowed mildew to come in and get firmly established.

Hybound, Drytan, Hytech, Euresco, Hybing and RS07751481 were the earliest maturing brown varieties of the drilled trials. Red Light, AF219 and Red Planet were the earliest of the reds. Vision, and Centro are also generally at the earlier end of the spectrum.

The mean of trial yields in Norfolk was 68t/ha browns and 57t/ha reds, high mildew levels will have been a major contributing factor to the yields.
The Essex trial yield means were 75t/ha browns and 64t/ha reds. Again the mildew levels will have severely impacted the yields.

The highest yielding brown varieties were Hybing, Hytune, Hytech and RS07751481.
Red Light was the highest yielding red variety.

There were a minimal number of rots in the harvested material and this was reflected in the storage results too. Some commercial crops still had issues with Fusarium.

Hybound, Hyway, SV8528ND and AF222 were the best of the varieties for having high percentages of single centres.
Hytune, SV1332ND, SV8528ND, Hyfive, Hyway, Chico and ABS217 all performed well in 2015. Hybound, Hybing, Hypark, Hysky, Progression, Chico, AF1.11 and Red Planet in 2014.

Storage assessments in an ambient store, were recorded in late-April and late-May 2017.

Storage potential continues to be a key factor for drilled crops. Drytan, Paradiso, SV0367, Medaillon, Hyway, Hysky and Centro all performed above average in 2016/17.
In 2012/13, 2013/14, 2014/15, 2015/16 Vision had above average percentages of sound bulbs at the late-May assessment.
AF219, AF175 and ABS212F1 performed well in the reds. Redspark has performed above average in previous years.

In CE storage the varieties Drytan, Hytune, SVND0363, SVND0367, Medaillon, Hyway and Hysky were all above average in 2015/16.
AF219, AF175 and Red Tide had the highest percentage of sound bulbs in the reds.

Stored bulb quality was generally very good throughout most of the varieties.

Main Conclusions

Set Trials

There was almost a month difference between the earliest and latest maturing varieties.

The yield potential of varieties can vary greatly. In the set trials this was over 30 t/ha between the highest and lowest yields (mean of both trials).

Yield out of store is also important. Main set material showed a difference of up to 40%, between the best and worst storage potential from ambient store.

Drilled Trials

In the drilled trials there was approx. 28t/ha between the highest and lowest yields (mean of both trials).

Drilled material showed a difference of over 55%, between the best and worst storage potential from ambient store and of approx. 65% from CE cold storage.

Mildew resistant varieties should require fewer and or cheaper fungicide programmes.

Action Points

- Select a range of varieties according to soil type, desired harvest period, habit vigour and disease tolerance.
- Select varieties best suited to your storage facilities.
- For varieties not suited to long term storage growers must be able to sell their produce quickly.
- In high disease pressure years growers should take advantage of material with disease resistance e.g. mildew resistance.