Grower Summary

Fv 348a

Onions - Independent assessment of field and storage potential of varieties

Final 2011

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Headline

- This assessment of onion varieties will allow growers to compare the range of new and old varieties and make informed choices for both seeds and sets.

Background

The aim of the work is to provide independent assessment of the yield, quality and storage potential of new onion varieties propagated from both seed and sets. 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.

Early maturing drilled varieties such as Hybing, Centro, Wellington and Vision are becoming increasingly popular. Maincrop varieties e.g. Arthur, Boston, Hybelle, Sunskin and Renate, still hold a large proportion of the acreage. Late maturing varieties such as Armstrong are still important in extending the harvest window.

Onions grown from sets ensure an early crop which avoids potentially damaging autumn harvest conditions and the earliest of these can attract a premium. In recent years there have been large numbers of new entries with new genetics - in particular those varieties bringing early maturity or mildew resistance.

‘Sturon type’ varieties continue to dominate the brown set maincrop maturity varieties. However there are very early maturing varieties such as ABS101 and VCS6003 which produce high yields that are suitable for the autumn markets. The mildew resistant variety Santero also has good storage potential and is valuable addition for organic growers. Red Baron has previously dominated the red set market but there is strong competition from early maturing material such as Red Emperor and Reddawn and high quality hybrids.

Summary of the results and main conclusions

Table A: NIAB Spring Planted Onion Trial from Sets 2010 - Varieties

Varieties in maturity order (mean of both sites)

			Maturity
Variety	**set source**		**Date of 80% foliage fallover**
BROWNS			**Mean**
VCS6003	English Set Company	UK	27-Jun
ABS 101	Allium Brassica Supplies	Holland	27-Jun
ABS 106	Allium Brassica Supplies	Holland	28-Jun
Forum F1	Broer/Elsoms	Holland	30-Jun
Alpha	Allium Brassica Supplies	Holland	01-Jul
Jagro (ESC)	English Set Company	UK	09-Jul
Elite Jagro (ABS)	Allium Brassica Supplies	Belgium	12-Jul
Sturon (ABS)	Allium Brassica Supplies	Belgium	16-Jul
Elite Rumba	Allium Brassica Supplies	France	17-Jul
Elite Setton	Allium Brassica Supplies	France	17-Jul
Stur BC 20	Broer/Elsoms	Holland	17-Jul
VCS6004	English Set Company	UK	18-Jul
VCS6005	English Set Company	UK	19-Jul
Sturon (ESC)	English Set Company	UK	19-Jul
Santero	English Set Company	UK	27-Jul
Hylander F1	Broer/Elsoms	Holland	01-Aug
Means			**12-Jul**
REDS			
Red Emperor (ABS)	Allium Brassica Supplies	Belgium	04-Jul
Red Emperor (ESC)	English Set Company	UK	05-Jul
Reddawn F1	Broer/Elsoms	Holland	15-Jul
Kamal	English Set Company	UK	22-Jul
Elite Garnet	Allium Brassica Supplies	France	23-Jul
Hyred F1	Broer/Elsoms	Holland	24-Jul
Elite Red Baron (ABS)	Allium Brassica Supplies	France	24-Jul
Romy	English Set Company	UK	25-Jul
Red Queen	Allium Brassica Supplies	Holland	25-Jul
Red Baron (ESC)	English Set Company	UK	26-Jul
Means			**19-Jul**

Lincs. trial planted 12th March except Red Queen 19th March.
Suffolk trial Browns and Red Emperor's planted 25th Feb
Elsoms browns and other reds planted 9th March except Red Queen 19th March.

Table B. NIAB Spring Sown Onion Trials from seed 2010 – Maturity and Yield data

Sites: Rix (Essex) and Raker (Norfolk)

Varieties in maturity order (mean of both sites) Main trial data first then Preliminary trial data

Preliminary varieties only single replicate of data (shown in italics)

		Mean Maturity	marketable yield (t/ha)			% sound in May 2010			% sound 3 weeks out of CE storage
Variety	**Source**	**80% foliage fallover**	**Essex**	**Norfolk**	**Mean**	**Essex**	**Norfolk**	**Mean**	**Essex**
BROWNS									
Hybing	Bejo	23-Aug	74.8	70.3	72.5	13.9	21.4	17.6	31.0
NIZ 37-71	Nickerson	28-Aug	63.9	60.4	62.2	15.4	21.8	18.6	36.0
Vision	Syngenta	29-Aug	71.9	70.0	70.9	27.4	36.5	31.9	44.0
Attraction	Syngenta	30-Aug	64.0	75.7	69.9	31.4	23.1	27.2	36.0
Wellington	Syngenta	31-Aug	70.1	70.4	70.2	38.4	34.0	36.2	71.0
Hytech	Bejo	01-Sep	76.1	66.5	71.3	22.1	25.0	23.5	32.0
Centro	Nickerson	02-Sep	68.9	73.2	71.0	24.3	21.7	23.0	36.0
Napoleon	Syngenta	02-Sep	70.6	68.7	69.6	18.8	28.3	23.5	42.0
Premito	Seminis	02-Sep	70.1	69.8	70.0	10.9	17.3	14.1	34.3
Hybound	Bejo	04-Sep	76.8	72.7	74.8	17.4	16.5	16.9	33.3
Sunnito	Seminis	06-Sep	69.3	65.1	67.2	9.1	17.2	13.1	24.0
Sunskin	Syngenta	07-Sep	80.1	77.1	78.6	20.9	29.0	24.9	42.0
Motion	Syngenta	07-Sep	70.4	72.0	71.2	40.7	21.2	30.9	49.0
Arthur	Advanta	12-Sep	73.9	74.1	74.0	16.1	21.0	18.6	19.0
Hylander	Bejo	14-Sep	72.5	74.9	73.7	10.9	11.0	11.0	34.0
Santero	Nickerson	15-Sep	63.5	61.7	62.6	23.9	21.0	22.4	46.0
Sherman	*Bejo*	*25-Aug*	*88.7*	*85.1*	*86.9*	*7.9*	*19.0*	*13.5*	*59.0*
Pegase	*Sakata*	*04-Sep*	*71.9*	*79.8*	*75.9*	*0.9*	*9.1*	*5.0*	*1.0*
NIZ 37-70	*Nickerson*	*08-Sep*	*68.0*	*69.0*	*68.5*	*15.0*	*17.0*	*16.0*	*33.0*
NIZ 37-82	*Nickerson*	*09-Sep*	*59.6*	*55.6*	*57.6*	*25.0*	*29.0*	*27.0*	*34.0*
SVS 69497	*Seminis*	*09-Sep*	*67.9*	*75.0*	*71.4*	*33.0*	*12.1*	*22.6*	*35.0*
NIZ 37-84	*Nickerson*	*12-Sep*	*78.1*	*70.0*	*74.0*	*17.2*	*13.1*	*15.2*	*36.0*
Hytide	*Bejo*	*13-Sep*	*72.5*	*83.8*	*78.2*	*16.7*	*14.0*	*15.3*	*49.0*
means		**04-Sep**	**71.5**	**71.3**	**71.4**	**19.9**	**20.8**	**20.4**	**37.2**
REDS									
Grenada	ProVeg Seeds	31-Aug	49.2	53.4	51.3	3.0	9.0	6.0	24.0
Red Tide	Bejo	02-Sep	67.2	59.3	63.2	13.9	7.4	10.6	22.0
Redspark	Bejo	09-Sep	66.5	64.9	65.7	25.8	28.2	27.0	43.0
Red Baron	Bejo	11-Sep	64.3	61.6	63.0	12.1	11.7	11.9	31.0
Red Queen	*Allium Brassica Supplies*	*11-Sep*	*53.6*	*54.0*	*53.8*	*29.0*	*26.7*	*27.9*	*43.0*
Renato	*Nickerson*	*12-Sep*	*64.3*	*49.9*	*57.1*	*8.0*	*12.0*	*10.0*	*26.0*
Garnet	*Allium Brassica Supplies*	*14-Sep*	*54.9*	*59.1*	*57.0*	*15.1*	*10.1*	*12.6*	*43.0*
9.125 F1	*Allium Farms*	*17-Sep*	*63.4*	*49.2*	*56.3*	*20.7*	*20.5*	*20.6*	*44.0*
means		**10-Sep**	**60.4**	**56.4**	**58.4**	**16.0**	**15.7**	**15.8**	**34.5**

Table C. NIAB Spring Planted Onion Trial from Sets 2010 – Yield data

Varieties in maturity order (mean of both sites)

Marketable yields are adjusted to give a truer representation of early varieties - % rots data removed

	marketable yield (t/ha)			% sound in February		
Variety	**Lincs**	**Suffolk**	**Mean**	**Lincs**	**Suffolk**	**Mean**
BROWNS						
VCS6003	38.5	58.8	48.6	7.3	41.4	24.3
ABS 101	42.5	55.1	48.8	9.4	17.2	13.3
ABS 106	39.4	52.7	46.1	8.8	47.1	27.9
Forum F1	50.4	68.0	59.2	7.6	11.8	9.7
Alpha	35.2	62.9	49.0	22.5	77.5	50.0
Jagro (ESC)	50.0	82.8	66.4	2.0	33.8	17.9
Elite Jagro (ABS)	48.3	59.0	53.7	1.6	8.3	5.0
Sturon (ABS)	48.3	79.4	63.9	17.8	79.2	48.5
Elite Rumba	52.8	77.7	65.3	17.5	77.3	47.4
Elite Setton	53.8	72.2	63.0	26.8	65.4	46.1
Stur BC 20	52.9	68.0	60.5	7.3	12.9	10.1
VCS6004	47.0	68.2	57.6	12.5	83.6	48.0
VCS6005	38.2	61.6	49.9	16.5	45.6	31.0
Sturon (ESC)	54.1	73.1	63.6	19.0	47.3	33.1
Santero	31.8	32.7	32.2	16.5	29.4	22.9
Hylander F1	43.0	44.8	43.9	18.2	27.2	22.7
Means	**45.4**	**63.6**	**54.5**	**13.2**	**44.1**	**28.6**
REDS						
Red Emperor (ABS)	45.7	71.8	58.7	1.1	9.2	5.1
Red Emperor (ESC)	46.9	62.7	54.8	6.5	12.3	9.4
Reddawn F1	55.3	54.2	54.8	3.7	4.5	4.1
Kamal	47.6	61.6	54.6	11.5	28.7	20.1
Elite Garnet	46.3	69.2	57.8	25.4	20.6	23.0
Hyred F1	39.6	50.5	45.1	12.8	40.7	26.7
Elite Red Baron (ABS)	49.1	67.3	58.2	15.7	26.1	20.9
Romy	41.9	53.5	47.7	16.8	40.0	28.4
Red Queen	47.1	59.1	53.1	12.3	41.8	27.0
Red Baron (ESC)	40.8	58.4	49.6	14.5	32.7	23.6
Means	**46.0**	**60.8**	**53.4**	**12.0**	**25.7**	**18.8**

Lincs. trial planted 12th March except Red Queen 19th March.
Suffolk trial Browns and Red Emperor's planted 25th Feb
Elsoms browns and other reds planted 9th March except Red Queen 19th March.

Trial site details

Sites were agreed with HDC/BOPA through a steering group, storage was at NIAB in an ambient store and at P G Rix in commercial 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
- J Raker Farms, Croxton, Norfolk – drilled onions
- P G Rix Farms, nr Bures, Essex – drilled onions

Trial records and data collected – set trials

The trials established well in good conditions. A dry spring meant that the Suffolk crop needed irrigating earlier than normal. The Lincs. trial had no irrigation.

The trials were harvested on 5th August (Suffolk) and 29th July (Lincs.). The bulbs were dried and cured before grading – problems with drying and curing resulted in a higher percentage of rots in the trial material than was seen commercially.

Trial records and data collected – drilled trials

The trials were harvested on 14th Sept (Norfolk) and 22nd Sept (Essex). The August and early September were very wet and meant that harvest was significantly delayed both the trials and on many commercial holdings. The wet harvest meant that some of the earlier maturing varieties suffered from a higher proportion of rots than normal. There were some problems with vigour in the very dry spring.

A study of seed treatments and coatings investigated the effect of four different combinations of treatments on three varieties.

Tables A lists the set varieties in trials in maturity order.

Tables B and C have key areas of interest - selected yield and storage data. The full report has a full set of data tables (appended).

Set trials - results

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

Mildew resistance

Santero is the first commercially produced mildew resistance set but there was not enough mildew in either trial to show its full potential. Hylander, seen for the first time as a set, also has claimed mildew resistance.

Maturity

VCS6003, ABS101 and ABS106 were the earliest maturing brown variety and the latest was Hylander over a month later.
In the red material Red Emperor was the earliest and Red Baron (and others) was the latest just over 3 weeks later.

Yield

The highest yielding variety (see tables) was Jagro. The Sturon types also gave high yields. Some of the earlier maturing varieties are disadvantaged slightly by being planted with the later maturing varieties. Generally they have high yields commercially and would be sent straight for sale or processing and not be held as long as these trial methods dictate.
The early reds Red Emperor and Reddawn gave high yields but need to go straight to market as they are not ideal for storage.

Storage potential

Earlier maturing varieties are prone to rotting as they tend to have thinner skins and softer tissue but this is only a problem if growers are considering storing them – which is not how these varieties should be targeted.

Alpha had the highest percentage of sound bulbs, of the brown varieties, at the final storage assessment in February. The Sturon types and VCS 6004 all have good storage potential. Red Queen had the highest numbers of marketable bulbs of the reds, but generally the reds did not store as well as the browns.

Drilled trials - results

Mildew resistance

Santero and Hylander both have claimed mildew resistance but there was not enough mildew in either trial to test these claims.

Maturity

Hybing was the earliest maturing varieties of the drilled trials. Sherman, in the preliminary trials was also very early to mature.

Yield

Sunskin and Hybound were the highest yielding. The preliminary varieties Sherman and Hytide had very high yields.

Redspark was the highest yielding red variety consistent with its high yields in 2009 trials.

Storage potential

There were some rots and defects in the harvested material of both the drilled trials but not as much as was expected from the late harvest after very wet conditions.

Bulb quality was generally very good throughout most of the varieties. Pegase, Grenada and 9.125 F1 were all slightly soft. Sherman and Pegase were thin skinned and some skins were lost at grading.

Wellington, Vision and Motion had the highest percentage of sound bulbs at the early-May storage assessment. The preliminary variety NIZ 37-82 also had very good storage results.
The preliminary variety Pegase is not suitable for ambient storage.

Redspark had the best storage results of the reds in the main trial plots (as in 2009) and the preliminary varieties Red Queen performed well in the preliminary trials.
Rots in storage material, in an ambient store, were mainly due to neck rot in Essex material and bacterial in the Norfolk material.

The quality out of CE store was generally as good as the material was going into storage. There were more rotten bulbs than in previous years due to the wet harvest conditions.
The browns, Wellington, Vision, Motion, Santero Sherman and Hytide and the reds Redspark, Red Queen, Garnet and 9.125 F1 had a high number of marketable bulbs (out of CE storage).

Primed seeds

Primed seed consistently had better early vigour and higher early populations. The early populations were reflected in the final populations but the yields were better aligned by variety rather than by treatment.

While there is no immediate quantifiable yield effect. The use of primed seed is likely give a more predictable establishment which can be used at drilling to plan the desired population.

Financial benefits

The yield potential of varieties can vary greatly. In the drilled trials this was >15t/ha between the highest and lowest mean yields. In the set trials the difference was >30t/ha.

Yield out of store is also important. Drilled material show a difference of 30% between the best and worst storage potential while in the sets this was over 60%.

Mildew resistant varieties require fewer and or cheaper fungicide programmes.

Action points for growers

- Select a range of varieties with different maturities to spread their harvest.
- Select varieties best suited to their 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.