



Horticultural
Development
Company

Grower summary

FV 348

Onions - Independent
assessment of field and storage
potential of varieties

Final Report 2010

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Headline

- New varieties continue to add positively to the choices available to growers with Vision offering excellent storage potential and Santero offering mildew resistance.
- There is a good range of set varieties in both colour and maturities giving growers a choice and options to spread their harvest windows.

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, 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. Particularly bringing either earlier maturing or mildew resistant varieties.

‘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 a 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.

Results

Tables A and B list the varieties in trials in maturity order.

Trial site details and a brief method follow the tables.

Table A: NIAB Spring Sown Onion Trials from seed 2009 – varieties

Sites: Rix (Essex) and Raker (Norfolk)

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

| | | | Maturity |
|--------------------|--------|--------------------------|------------------------------|
| Variety | Status | Source | Date of 80% foliage fallover |
| BROWNS | | | Mean |
| Centro | 4 | Nickersons | 21-Aug |
| Vision | 3 | Syngenta | 21-Aug |
| Hybing | C | Bejo / Elsoms | 22-Aug |
| Wellington | C | Syngenta | 22-Aug |
| NIZ 37-71 | 1 | Nickerson | 22-Aug |
| Premito | 3 | Seminis | 23-Aug |
| NIZ 37-70 | 1 | Nickerson | 24-Aug |
| Hypark | 3 | Bejo / Elsoms | 25-Aug |
| Napoleon | R | Syngenta | 25-Aug |
| Hytech | C | Bejo / Elsoms | 25-Aug |
| Bennito | R | Seminis | 26-Aug |
| Tangito | R | Seminis | 26-Aug |
| Hybelle | (3) | Bejo / Elsoms | 27-Aug |
| ADV 36393 | 1 | Advanta | 28-Aug |
| Arthur | C | Advanta | 28-Aug |
| Santero | 3 | Nickersons | |
| Hylander | 1 | Bejo / Elsoms | 30-Aug |
| Sunskin | R | Syngenta | 31-Aug |
| Pegase | P | Sakata | 21-Aug |
| ONL295 | P | Syngenta | 21-Aug |
| Sunnito | P (3) | Seminis | 23-Aug |
| ONL301 | P | Syngenta | 24-Aug |
| BGS 266 | P | Bejo / Elsoms | 24-Aug |
| SVS 69497 | P | Seminis | 26-Aug |
| Brown means | | | 25-Aug |
| REDS | | | |
| Redspark | R | Bejo / Elsoms | 27-Aug |
| 301/5 | 3 | Allium Farms | 27-Aug |
| Red Baron | C | Bejo / Elsoms | 29-Aug |
| ABS 203 | P | Allium Brassica Supplies | 23-Aug |
| Grenada | P | ProVeg Seeds | 23-Aug |
| Red Tide | P | Bejo / Elsoms | 24-Aug |
| 7-200 | P (2) | Allium Farms | 26-Aug |
| Red means | | | 28-Aug |

Status

C = control

R => 3years in trial

x = years in trial

P = preliminary

Table B: NIAB Spring Planted Onion Trial from Sets 2009 - 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 | 05-Jul |
| Elite Jagro | Allium Brassica Supplies | France | 09-Jul |
| Alpha | Allium Brassica Supplies | Holland | 10-Jul |
| ABS 107 | Allium Brassica Supplies | France | 11-Jul |
| Jagro | English Set Company | UK | 13-Jul |
| Forum | Broer/Elsoms | Holland | 13-Jul |
| Stur BC 20 | Broer/Elsoms | Holland | 14-Jul |
| Hercules | Broer/Elsoms | Holland | 16-Jul |
| Elite Rumba | Allium Brassica Supplies | France | 19-Jul |
| VCS6004 | English Set Company | UK | 19-Jul |
| Sturon | English Set Company | UK | 23-Jul |
| VCS6005 | English Set Company | UK | 25-Jul |
| Santero | English Set Company | UK | 04-Aug |
| Brown means | | | 16-Jul |
| REDS | | | |
| ABS 206 | Allium Brassica Supplies | France | 10-Jul |
| Reddawn F1 | Broer/Elsoms | Holland | 14-Jul |
| Red Emperor | English Set Company | UK | 15-Jul |
| Red Emperor | Allium Brassica Supplies | France | 19-Jul |
| ABS 203 | Allium Brassica Supplies | France | 29-Jul |
| Kamal | English Set Company | UK | 30-Jul |
| Red Baron | Broer/Elsoms | Holland | 01-Aug |
| Romy | English Set Company | UK | 01-Aug |
| Red Baron | Allium Brassica Supplies | France | 01-Aug |
| Hyred | Broer/Elsoms | Holland | 02-Aug |
| Red means | | | 16-Jul |

Reddawn F1; Red Emperor (ALLIUM BRASSICA SUPPLIES); ALLIUM BRASSICA SUPPLIES 206 (ALLIUM BRASSICA SUPPLIES) - all planted with Browns

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, Stoke-by-Nayland, Essex – drilled onions

Production details

All trials adopted the local host farm practice.

Suffolk sets

Site near east coast on a South facing slope.
Sandy soil
No major weed issues
No major foliar diseases
Hand planted at 42 plants per square metre
Irrigated throughout season

Lincolnshire sets

Site open flat field
Silty soil
Some weed issues in two plots (not used for yield data)
Mildew late in season
Hand planted at 42 plants per square metre

Norfolk drilled seed

Site on East facing slope
Light sandy silt soil
No major weed issues
No major foliar diseases
Drilled browns at 48/m² and reds 44/m²
Irrigated to establish trial

Essex drilled seed

Site on East facing slope
Light silt soil
No major weed issues
Mildew late in season, controlled using full fungicide programme
Drilled browns at 55/m² and reds 48/m²
Irrigated to establish trial

Trial design

The main trials were a randomized complete block design.
The set trials had two replicates, of 5 m² plots.
The drilled trials had three replicates, 11 m² plots, in the main trials. Varieties classed as 'preliminary' in the drilled trials were not-replicated but were randomised in a single block.
Presented data is mean values.

Trial records and data collected

The set trial browns were planted on 23rd Feb. (Suffolk) and 12th Mar. (Lincs), the Reddawn, Red Emperor (ABS) and ABS206 were planted at the same time as the browns. The reds and the Santero were planted on 25th Mar (Suffolk) and 27th Mar (Lincs).
The trials established well in good conditions. A dry spring meant that crops were irrigated earlier than normal. The trials and some set crops were harvested in a wet period in July and this was reflected by a large number of rots after drying and curing – especially in the earlier maturing varieties.

Plant establishment, vigour, disease incidence, bolters and plant maturity for harvest were all recorded in the field.

Table C: NIAB Spring Sown Onion Trials from seed 2009

Varieties in maturity order (mean of both sites)

| Variety | Marketable yield (t/ha) | | | % Sound bulb in May | | | % Sound 1 month after removal from CE store |
|--------------------|-------------------------|-------------|-------------|---------------------|-----------|-----------|---|
| | Rix | Raker | Mean | Rix | Raker | Mean | |
| BROWNS | | | | | | | |
| <i>Centro</i> | 72.7 | 76.4 | | | | | |
| Vision | 75.2 | 67.8 | 71.5 | 57 | 61 | 59 | 29 |
| Hybing | 73.9 | 65.7 | 69.8 | 26 | 16 | 21 | 13 |
| Wellington | 71.3 | 64.0 | 67.6 | 43 | 44 | 43 | 21 |
| NIZ 37-71 | 71.6 | 59.1 | 65.4 | 49 | 64 | 57 | 15 |
| Premito | 74.8 | 59.6 | 67.2 | 23 | 13 | 18 | 6 |
| NIZ 37-70 | 68.0 | 62.7 | 65.3 | 23 | 22 | 23 | 4 |
| Hypark | 66.5 | 58.6 | 62.5 | 23 | 20 | 21 | 20 |
| Napoleon | 68.8 | 60.4 | 64.6 | 27 | 27 | 27 | 9 |
| Hytech | 69.1 | 62.1 | 65.6 | 27 | 46 | 37 | 9 |
| Bennito | 72.0 | 57.8 | 64.9 | 21 | 27 | 24 | 11 |
| Tangito | 72.6 | 60.6 | 66.6 | 11 | 23 | 17 | 6 |
| Hybelle | 70.1 | 60.9 | 65.5 | 20 | 14 | 17 | 18 |
| ADV 36393 | 71.7 | 57.0 | 64.4 | 26 | 19 | 23 | 12 |
| Arthur | 72.6 | 67.0 | 69.8 | 29 | 24 | 26 | 13 |
| <i>Santero</i> | | 64.8 | | | | | |
| Hylander | 66.8 | 56.4 | 61.6 | 24 | 21 | 22 | 14 |
| Sunskin | 63.0 | 58.3 | 60.6 | 30 | 22 | 26 | 17 |
| Brown means | 70.5 | 61.1 | 65.8 | 29 | 29 | 29 | 14 |
| REDS | | | | | | | |
| Redspark | 68.7 | 44.9 | 56.8 | 38 | 47 | 43 | 30 |
| 301/5 | 58.2 | 32.3 | 45.2 | 24 | 31 | 28 | 15 |
| Red Baron | 67.4 | 46.5 | 57.0 | 33 | 23 | 28 | 11 |
| Red means | 64.8 | 41.3 | 53.0 | 32 | 34 | 33 | 19 |
| BROWNS | | | | | | | |
| Pegase | 88.8 | 85.7 | 87.2 | 0 | 1 | 1 | 1 |
| ONL295 | 74.9 | 66.6 | 70.8 | 45 | 87 | 66 | 34 |
| Sunnito | 67.0 | 62.9 | 64.9 | 22 | 11 | 16 | 8 |
| ONL301 | 68.3 | 71.2 | 69.7 | 52 | 39 | 45 | 21 |
| BGS 266 | 73.5 | 62.9 | 68.2 | 26 | 9 | 17 | 12 |
| SVS 69497 | 75.1 | 68.2 | 71.7 | 26 | 45 | 36 | 6 |
| Brown means | 74.6 | 69.6 | 72.1 | 29 | 32 | 30 | 14 |
| REDS | | | | | | | |
| ABS 203 | 60.1 | 56.0 | 58.0 | 26 | 58 | 42 | 36 |
| Grenada | 58.3 | 48.0 | 53.2 | 31 | 51 | 41 | 9 |
| Red Tide | 63.7 | 43.4 | 53.5 | 39 | 13 | 26 | 6 |
| 7-200 | 53.2 | 43.3 | 48.3 | 9 | 9 | 9 | 5 |
| Red means | 58.8 | 47.7 | 53.2 | 26 | 33 | 30 | 14 |

The trials were harvested on 5th August (Suffolk) and 4th August (Lincs). The bulbs were dried and cured before grading. Grading fractions records included weight by grade size, number of rots, defects and bulb quality. A sample of 100 bulbs from each plot was stored (ambient store) and assessed twice to record the number of sound bulbs, sprouted bulbs, rots and bulb quality.

The drilled trials were sown on 17th March in Norfolk and 19th March in Essex. Although the trials went into good soils the spring was very dry and the Essex trial needed irrigation to establish. The wet July gave much needed moisture and the dry August and September meant that harvest was uninterrupted in both the trials and on many commercial holdings. The dry harvest meant that there were very few rots in storage.

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

Table D: NIAB Spring Planted Onion Trial from Sets 2009

Varieties in maturity order (mean of both sites)

| Variety | marketable yield (t/ha) | | | % sound bulbs in February | | |
|-------------------------------|-------------------------|-------------|-------------|---------------------------|---------|------|
| | Lincs | Suffk | Mean | Lincs | Suffolk | Mean |
| BROWNS | | | | | | |
| VCS6003 | 48.4 | 70.2 | 59.3 | 12 | 8 | 10 |
| Elite Jagro | 88.6 | 98.7 | 93.7 | 28 | 11 | 20 |
| Alpha | - | 66.9 | | | | |
| ABS 107 | - | 86.0 | | | | |
| Jagro | 62.7 | 81.4 | 72.1 | 28 | 22 | 25 |
| Forum | 59.9 | 71.9 | 65.9 | 2 | 3 | 3 |
| Stur BC 20 | 56.4 | 69.1 | 62.8 | 9 | 23 | 16 |
| Hercules | 63.7 | 73.9 | 68.8 | 14 | 10 | 12 |
| Elite Rumba | - | 80.8 | | | | |
| VCS6004 | 61.9 | 80.6 | 71.3 | 45 | 41 | 43 |
| Sturon | 66.3 | 91.3 | 78.8 | 24 | 45 | 35 |
| VCS6005 | 65.5 | 71.8 | 68.7 | 54 | 24 | 39 |
| Santero | 40.5 | 57.6 | 49.1 | 25 | 48 | 36 |
| Brown means | 61.4 | 76.9 | 69.2 | | | |
| REDS | | | | | | |
| ABS 206 | - | 80.8 | | | | |
| Reddawn F1 | 59.9 | 74.5 | 67.2 | 27 | 13 | 20 |
| Red Emperor (ESC) | 42.3 | 62.4 | 52.4 | 21 | 11 | 16 |
| Red Emperor (ABS) | - | 63.2 | | | | |
| ABS 203 | - | 53.1 | | | | |
| Kamal | 42.7 | 44.1 | 43.4 | 76 | 29 | 52 |
| Red Baron (ABS) (BAS)(Elsoms) | 51.9 | 75.4 | 63.7 | 66 | 32 | 49 |
| Romy | 37.4 | 57.6 | 47.5 | 70 | 44 | 57 |
| Red Baron (Elsoms) | 54.5 | 61.1 | 57.8 | 49 | 19 | 34 |
| Hyred | 54.0 | 62.1 | 58.1 | 63 | 40 | 51 |
| Red means | 49.0 | 63.4 | 56.2 | | | |

Reddawn F1; Red Emperor (ALLIUM BRASSICA SUPPLIES); ALLIUM BRASSICA SUPPLIES 206 (ALLIUM BRASSICA SUPPLIES) - all planted with Browns

Discussion - Drilled trials

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

There were no problems with vigour.

Centro and Vision were the earliest maturing varieties of the drilled trials. They were also the highest yielding. The preliminary varieties Pegase and ONL295 had very high yields. Red spark and Red Baron both had high yields as did the preliminary varieties ABS203, Grenada and Red Tide.

There were very few rots or defects in the harvested material in either of the drilled trials.

Storage assessments, in an ambient store, were recorded in mid-March and late-April. A further assessment was possible in mid-May. Many of the rots were bacterial in nature.

Vision and NIZ 37-71 had the highest percentage of sound bulbs at the mid-May assessment, both with more than 50% of marketable bulbs. The preliminary variety ONL295 also had very good storage results.

The preliminary variety Pegase is not suitable for ambient storage based on this first year of data.

Redspark had the best storage results of the reds in the main trial plots and the preliminary varieties ABS203 and Grenada both performed well in the preliminary trials.

Due to the cooler conditions the bulb quality was good throughout most of the varieties with no really poor performers.

A sub-sample of most varieties was stored in a CE store (courtesy of Rix Farms). Bulbs were taken out of store on 25th June and the final assessment on 21st July has been reported (Full report table 9).

The quality out of store was almost as good as the material was going into storage. There were few rotten bulbs.

Once more Vision and ONL295, in the browns and the reds Redspark and ABS203 had a high number of marketable bulbs.

Discussion - Set trials

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

Santero is the first commercially produced mildew resistance set but there was not enough mildew in either trial to show its full potential.

VCS6003 was the earliest maturing brown variety and the latest was Santero almost a month later.

In the red material ABS206 was the earliest and Hyred was the latest just over 3 weeks later.

The highest yielding variety (table 10) 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 ABS206 and Reddawn both gave very high yields.

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.

Storage assessments, in an ambient store, were recorded in late-January and late-February.

VCS66004 had the highest percentage of sound bulbs, of the brown varieties, at final assessment in February. In the reds Romy, Kamal, Hyred and Red Baron (ABS) all had high numbers of marketable bulbs.

Conclusions – Drilled trials

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

For organic growers and for high disease pressure years the mildew resistant varieties Santero and Hylander both offer potential.

Centro and Vision were the earliest maturing and highest yielding varieties in the established brown varieties. The preliminary varieties Pegase and ONL295 had very high yields.

Redspark and Red Baron both had high yields as did the preliminary varieties ABS203, Grenada and Red Tide.

Bulb quality is generally very good. Most varieties have good skin finish, bulb shape and firmness. This reflects an improvement as newer material comes through breeders trials.

Storage potential continues to be a key factor for drilled crops. The majority of material stores well, in ambient store, until March and early April but then the differences start to appear.

Vision and NIZ 37-71 had the highest percentage of sound bulbs at the mid-May assessment, both with more than 50% of marketable bulbs. The preliminary variety ONL295 also had very good storage results.

The preliminary variety Pegase is not suitable for ambient storage based on this first year of data.

Redspark had the best storage results of the reds in the main trial plots and the preliminary varieties ABS203 and Grenada both performed well in the preliminary trials.

Material stored in CE conditions held well until the end of June. When kept out of store for 4 weeks the best performing varieties were Vision and ONL295, in the browns and in the reds Redspark and ABS203 also had high numbers of marketable bulbs.

Conclusions – set trials

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

There is a good range of maturities allowing growers to spread their harvest period. VCS6003 was the earliest maturing brown variety and the latest was Santero almost a month later.

In the red material ABS206 was the earliest and Hyred was the latest just over 3 weeks later.

Santero offers mildew resistance for high disease pressure situations.

The highest yielding variety was Jagro. The 'Sturon types' also gave high yields. Earlier maturing varieties 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 ABS206 and Reddawn both gave very high yields.

VCS66004 had the highest percentage of sound bulbs after ambient storage, of the brown varieties, at the final assessment in February. In the reds Romy, Kamal, Hyred and Red Baron (ABS) all had high numbers of marketable bulbs.

This is a précis of the information presented in the 'Full Trial Report'. The Full Report is available from HDC.