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| Project leader: | Bruce Napier, NIAB |
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| 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 |

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[The results and conclusions in this report are based on an investigation conducted over a one-year period. The conditions under which the experiments were carried out and the results have been reported in detail and with accuracy. However, because of the biological nature of the work it must be borne in mind that different circumstances and conditions could produce different results. Therefore, care must be taken with interpretation of the results, especially if they are used as the basis for commercial product recommendations.]

AUTHENTICATION

We declare that this work was done under our supervision according to the procedures described herein and that the report represents a true and accurate record of the results obtained.

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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 | <i>Allium Seeds UK Ltd</i> | 08-Jul | 24.9 | - |
| <i>Vulcan200</i> | <i>Allium Seeds</i> | <i>Allium Seeds UK Ltd</i> | <i>08-Jul</i> | 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 | <i>Allium Seeds UK Ltd</i> | 17-Jul | 56.7 | - |
| Jagro | English Set Company | Bejo/De Groot en Slot | 20-Jul | 57.0 | |
| <i>Contado</i> | <i>English Set Company</i> | <i>confidential</i> | <i>01-Aug</i> | 38.4 | |
| | | | | | |
| Early Reds | | | | | |
| <i>ABS 240</i> | <i>Allium Seeds</i> | <i>Allium Seeds UK Ltd</i> | <i>09-Jul</i> | 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 | | | | | |
| <i>Euresco</i> | <i>Hazera</i> | 17-Aug | 63.6 | 9 | 6 |
| <i>Drytan</i> | <i>Bejo/DGS</i> | 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 |
| <i>Hytune</i> | <i>Bejo/DGS</i> | 22-Aug | 82.1 | 35 | 66 |
| SV3557ND | Seminis | 22-Aug | 72.9 | 38 | 33 |
| <i>SVND 0363</i> | <i>Seminis</i> | 23-Aug | 68.8 | 32 | 60 |
| Vision | Syngenta | 24-Aug | 73.3 | 37 | 43 |
| <i>Ceresco</i> | <i>Hazera</i> | 24-Aug | 55.0 | 19 | 26 |
| Rockito | Seminis | 25-Aug | 71.9 | 29 | 16 |
| SV8528ND | Seminis | 25-Aug | 73.6 | 33 | 38 |
| <i>Manesco</i> | <i>Hazera</i> | 25-Aug | 57.8 | 20 | 23 |
| Paradiso | Hazera | 28-Aug | 69.7 | 45 | 24 |
| Centro | Hazera | 28-Aug | 74.8 | 26 | 18 |
| <i>SVND 0367</i> | <i>Seminis</i> | 28-Aug | 65.2 | 46 | 54 |
| Medaillon | Syngenta | 28-Aug | 71.7 | 47 | 60 |
| <i>Sanjato (37-1003)</i> | <i>Hazera</i> | 30-Aug | 72.7 | 42 | 22 |
| Motion | Syngenta | 30-Aug | 76.2 | 41 | 36 |
| <i>Hyfive</i> | <i>Bejo/DGS</i> | 30-Aug | 71.9 | 23 | 39 |
| <i>Hyway</i> | <i>Bejo/DGS</i> | 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 |
| <i>AF 219</i> | <i>Allium Farms</i> | 19-Aug | 62.3 | 53 | 46 |
| <i>Red Planet</i> | <i>Allium Farms</i> | 19-Aug | 58.4 | 25 | 14 |
| <i>AF 111</i> | <i>Allium Farms</i> | 21-Aug | 56.9 | 23 | 34 |
| <i>AF 222</i> | <i>Allium Farms</i> | 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.

SCIENCE SECTION

Introduction

The aim of the work is to provide independent assessment of the growth habit, yield, quality and storage potential of new onion varieties, propagated from sets and seed, that meet grower requirements i.e. high marketable yield, disease resistance, good quality and storability. These requirements need to be balanced and compared over a number of years as there can be a great deal of variation between seasons.

There are direct comparisons of new and established varieties.

Varieties can perform very differently in the United Kingdom from Holland and other parts of mainland Europe. Breeding companies have central breeding programmes and they trial their varieties in a number of countries to find the ones that are most suitable to the local conditions and growing practices. UK trials are essential to informing growers when selecting varieties.

Onions grown from sets ensure an early crop which avoids potentially challenging autumn harvest conditions and the earliest of these can attract a premium. Newer entries have brought new genetics - in particular varieties bringing early maturity or mildew resistance. However there are bolting risks associated with some early material as it may be best suited to intermediate day length rather than long day length. Set trials are conducted in alternate years – the last trials were in 2014.

‘Sturon type’ varieties continue to dominate the brown set main-crop maturity varieties. However there are very early maturing varieties which produce high yields that are suitable for the autumn markets. The mildew resistant variety Santero also has good storage potential, as a set onion, 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 high quality hybrids.

Drilled onions account for approximately 70% of the area grown in the UK. Early maturing varieties such as Hybound, Hybing, Centro and Vision are popular. 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 as still grown on a small scale but there are not enough varieties to warrant evaluation trials.

Varieties and numbered selections included

Table C. 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 | <i>Allium Seeds UK Ltd</i> | 08-Jul | 24.9 | - |
| <i>Vulcan200</i> | <i>Allium Seeds</i> | <i>Allium Seeds UK Ltd</i> | <i>08-Jul</i> | 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 | <i>Allium Seeds UK Ltd</i> | 17-Jul | 56.7 | - |
| Jagro | English Set Company | Bejo/De Groot en Slot | 20-Jul | 57.0 | |
| <i>Contado</i> | <i>English Set Company</i> | <i>confidential</i> | <i>01-Aug</i> | 38.4 | |
| | | | | | |
| Early Reds | | | | | |
| <i>ABS 240</i> | <i>Allium Seeds</i> | <i>Allium Seeds UK Ltd</i> | <i>09-Jul</i> | 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 |
| <i>Contado</i> | <i>English Set Company</i> | <i>Confidential</i> | <i>03-Aug</i> | 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 |

Table D. 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 | | | | | |
| <i>Euresco</i> | <i>Hazera</i> | 17-Aug | 63.6 | 9 | 6 |
| <i>Drytan</i> | <i>Bejo/DGS</i> | 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 |
| <i>Hytune</i> | <i>Bejo/DGS</i> | 22-Aug | 82.1 | 35 | 66 |
| SV3557ND | Seminis | 22-Aug | 72.9 | 38 | 33 |
| <i>SVND 0363</i> | <i>Seminis</i> | 23-Aug | 68.8 | 32 | 60 |
| Vision | Syngenta | 24-Aug | 73.3 | 37 | 43 |
| <i>Ceresco</i> | <i>Hazera</i> | 24-Aug | 55.0 | 19 | 26 |
| Rockito | Seminis | 25-Aug | 71.9 | 29 | 16 |
| SV8528ND | Seminis | 25-Aug | 73.6 | 33 | 38 |
| <i>Manesco</i> | <i>Hazera</i> | 25-Aug | 57.8 | 20 | 23 |
| Paradiso | Hazera | 28-Aug | 69.7 | 45 | 24 |
| Centro | Hazera | 28-Aug | 74.8 | 26 | 18 |
| <i>SVND 0367</i> | <i>Seminis</i> | 28-Aug | 65.2 | 46 | 54 |
| Medaillon | Syngenta | 28-Aug | 71.7 | 47 | 60 |
| <i>Sanjato (37-1003)</i> | <i>Hazera</i> | 30-Aug | 72.7 | 42 | 22 |
| Motion | Syngenta | 30-Aug | 76.2 | 41 | 36 |
| <i>Hyfive</i> | <i>Bejo/DGS</i> | 30-Aug | 71.9 | 23 | 39 |
| <i>Hyway</i> | <i>Bejo/DGS</i> | 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 |
| <i>AF 219</i> | <i>Allium Farms</i> | 19-Aug | 62.3 | 53 | 46 |
| <i>Red Planet</i> | <i>Allium Farms</i> | 19-Aug | 58.4 | 25 | 14 |
| <i>AF 111</i> | <i>Allium Farms</i> | 21-Aug | 56.9 | 23 | 34 |
| <i>AF 222</i> | <i>Allium Farms</i> | 23-Aug | 55.0 | 36 | 21 |
| Retano | Hazera | 24-Aug | 58.8 | 21 | 36 |
| <i>AF 175</i> | <i>Allium Farms</i> | 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 |

Trial site details

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

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

- A W Mortier Farms, nr Leiston, Suffolk - set onions on a sandy soil
- R Oldershaw Farms, nr Weston, Lincolnshire – set onions on a silty soil
- Raker Farms, Croxton, Norfolk – drilled onions on a Breckland soil
- P G Rix Farms, nr Colchester, Essex – drilled onions on a silty soil

All four trials followed local commercial agronomy. No maleic hydrazide was applied.

Production details

The set 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 drilled trials were drilled in good conditions on 18th March (Norfolk) and 17th March (Essex).

The trials were harvested on 10th September (Norfolk) and 11th September (Essex).

Trial design

The trial designs were randomised complete block.

The main trials had 3 replicates and the preliminary varieties only 2 replicates which were randomised with the first two replicates of the main trial.

Trial records and data collected

The 2016 season drilled 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 until July/August but a very wet June and severe hail in July caused problems of stressed and damaged plants. Some commercial crops were severely affected and performance reflected the soil types, fertility and field aspects. Bolting was an issue in several varieties within commercial crops and in the variety Hytune in the trials.

Only the Lincs set trial suffered from hail damage but mildew was a major problem in both drilled trials.

Key varieties are discussed below and summarised in Tables C and D. Full data summaries are appended.

Discussion

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 and ranked higher than normal in the 2016 mildew affected trials. The mildew was at high enough levels that it was difficult to keep under control by regular fungicide applications.

Plant breeders continue to attempt to breed mildew resistance into commercially viable new varieties.

Establishment was good in both set and drilled trials. Set and seed beds were generally of a good quality; cold temperatures in March, April and May meant that growth was slow; June was very wet and on sandier soils resulted in nutrient leaching and thus stressed plants. Stressed fields were more prone to mildew damage and harder to keep in check with fungicide programmes. Temperatures improved in July and early August helping with bulb filling, however some crops were severely affected by hail storms.

Discussion - Set trials

Establishment was good if a little slow to get started. Set availability for trials was a problem where varieties required greater amounts of heat treatment 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 in a year of slow establishment. There were some bolters within the varieties Troy, Alpha and Forum.

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.

The new early red variety ABS240 had very high levels of single centres making it suitable for onion ring production. Other varieties which performed well were Alpha, Vulcan 200, Hercules, VCS6004, Red Baron, Red Light and Red Ray.

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.

Discussion - drilled trials

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.

Centro, Red Light, AF222 and AF175 all showed good early vigour. Bolters were more noticeable in August with the worst affected variety being Hytune at a level of approx. 1%.

Mildew levels were very severe in some varieties. The two mildew resistant Santero and Sanjato had trace levels only. These varieties are known to have a low level of out-types so some mildew infect is expected but manageable.

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 Essex trial of 2015 had record yields of over 100t/ha well above the 10 year average (102t/ha browns and 88t/ha reds in 2015 compared with respective averages of 71t/ha and 60t/ha) showing the 'full' potential of the high yielding varieties.

The highest yielding brown varieties were Hybing, Hytune, Hytech and RS07751481. Red Light was the highest yielding red variety. The mildew resistant varieties Sanjato and Santero performed well.

There were a minimal number of rots in the harvested material and this was reflected in the storage results too. Fusarium continues to be a major concern in commercial crops and the focus of breeding programmes is to introduce known resistances into commercially viable lines.

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.

Conclusions

The yield potential of varieties can vary greatly. In the drilled trials this was approx. 28t/ha between the highest and lowest yield means and in the set trials 32t/ha between the highest and lowest yields.

The trials yield data is a good starting point for selecting varieties but other factors need to be considered.

Varities should be selected on:

- maturity (to stagger the harvest season);
- storage potential (to extend the availability of UK onions) and yield out of store;
- disease resistance (i.e. mildew resistance);
- single centres (for onion ring production which attracts a premium).

Selected varieties have been commented on in the discussion section.

Set Varieties

Alpha, Spitfire, Troy and ABS240 were the earliest maturing varieties.

The highest yielding early varieties were Jagro and Griffon.

Rumba, Sturon and Red baron were the highest yielding main crop varieties.

Rumba, VCS6004 and Red Ray were the best in ambient storage.

Drilled Varieties.

Hybound, Hybing and Drytan are consistently early maturing brown varieties. Red Light and Red Planet are commonly the earliest reds.

The highest yielding brown varieties were Hybing, Hytune, Hytech and RS07751481.

Red Light was the highest yielding red as in previous seasons.

Drytan, Paradiso, SV0367, Medaillon, Hyway, Hysky and Centro all had better than average storage potential in ambient store and Vision is normally in this category too.

Drytan, Hytune, SVND0363, SVND0367, Medaillon, Hyway, Hysky, AF219, AF175 and Red Tide all had better than average storage potential under controlled environment storage. Vision and Red Light have both performed well in previous seasons.

Financial Benefits

The yield potential of varieties can vary greatly. In the drilled trials this was approx 28t/ha between the highest and lowest yields (mean of both trials).

Yield out of store is also important. Drilled material show a difference of over 40% and 55% between the best and worst storage potential from ambient storage in the browns and reds respectively. From CE cold storage the differences were approx. 60% for browns and reds.

Mildew resistant varieties 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.

Technology transfer

Updates of trial data were circulated to levy payers by AHDB and also to sponsoring breeders and seed companies.

Open days and events were also hosted on three occasions:

1. Drilled crop field open day in Norfolk – August 2016
2. Drilled crops harvested produce open day and technical presentations at NIAB, Cambridge – November 2016

These events were well attended by a number of growers, seed trade, agronomists, research providers, etc. The farming press always attend the open days and there was significant coverage of the results – particularly in The Vegetable Farmer and Horticulture Week.

Trials and onion related updates are regularly featured on social media through twitter @AHDB_Hort @basnapier @NIABTAG @BritishGrowers with a combined following of over 15,000 users.

BOPA monthly grower newsletters are also used to circulate key dates and information.

Appendices

Table 1. NIAB Spring Planted Onion Trial from Sets 2016 - Varieties

Varieties in maturity order (mean of both sites)

| | | | Maturity | Maturity |
|------------------------|----------------------------|----------------------------|------------------------------|------------------------------|
| Variety | set source | Seed source | Date of 80% foliage fallover | Date of 80% foliage fallover |
| Early Browns | | | Lincs | Suffolk |
| Troy | Bejo/DGS | Bejo/De Groot en Slot | - | 06-Jul |
| Alpha | Allium Seeds | <i>Allium Seeds UK Ltd</i> | - | 08-Jul |
| <i>Vulcan200</i> | <i>Allium Seeds</i> | <i>Allium Seeds UK Ltd</i> | - | <i>08-Jul</i> |
| Spitfire | Allium Seeds | Allium Seeds UK Ltd | - | 09-Jul |
| Forum | Bejo/DGS | Bejo/De Groot en Slot | - | 10-Jul |
| Griffon | Allium Seeds | <i>Allium Seeds UK Ltd</i> | - | 17-Jul |
| Jagro | English Set Company | Bejo/De Groot en Slot | | 20-Jul |
| <i>Contado</i> | <i>English Set Company</i> | <i>confidential</i> | | <i>01-Aug</i> |
| | | | | |
| Early Reds | | | | |
| <i>ABS 240</i> | <i>Allium Seeds</i> | <i>Allium Seeds UK Ltd</i> | - | <i>09-Jul</i> |
| | | | | |
| Maincrop Browns | | | | |
| Rumba | Allium Seeds | Allium Seeds UK Ltd | 18-Jul | 02-Aug |
| Sturon | English Set Company | Confidential | 22-Jul | 05-Aug |
| Hercules | Bejo/DGS | Bejo/De Groot en Slot | 24-Jul | 04-Aug |
| <i>Contado</i> | <i>English Set Company</i> | <i>Confidential</i> | <i>28-Jul</i> | <i>03-Aug</i> |
| VCS 6004 | English Set Company | Confidential | 02-Aug | 02-Aug |
| VCS 6005 | English Set Company | Confidential | 05-Aug | 05-Aug |
| SturBC20 | Bejo/DGS | Bejo/De Groot en Slot | 05-Aug | 09-Aug |
| | | | | |
| Maincrop Reds | | | | |
| Red Baron | Broer/Elsoms | Bejo/De Groot en Slot | 07-Aug | 04-Aug |
| Red Light F1 | Broer/Elsoms | Bejo/De Groot en Slot | 12-Aug | 08-Aug |
| Red Ray F1 | Broer/Elsoms | Bejo/De Groot en Slot | 13-Aug | 10-Aug |

Suffolk early trial planted 04th Feb except for ABS 240 on 11th Mar

Suffolk main trial browns planted 17th Feb and reds 21st Mar

Lincs. trial browns planted 16th Feb and reds 22nd Mar

Table 2. NIAB Spring Planted Onion Trial from Sets 2016 – Yield data

Varieties in maturity order (mean of both sites)

| Variety | Population & Yield | | | | | | | | | | | |
|------------------------|-----------------------------|-------|------|-------------------------|-------|------|--------------------------|-------|------|---------------------------|-------|------|
| | plant pop. (plants / sq. m) | | | marketable yield (t/ha) | | | % bulbs by weight > 60mm | | | % defects (not inc. rots) | | |
| | Lincs | Suffk | Mean | Lincs | Suffk | Mean | Lincs | Suffk | Mean | Lincs | Suffk | Mean |
| Early Browns | | | | | | | | | | | | |
| Troy | | 40.1 | 40.1 | | 35.7 | 35.7 | | 50.1 | 50.1 | | 8.1 | 8.1 |
| Alpha | | 44.8 | 44.8 | | 24.9 | 24.9 | | 14.0 | 14.0 | | 3.5 | 3.5 |
| <i>Vulcan 200</i> | | 42.1 | 42.1 | | 38.5 | 38.5 | | 44.0 | 44.0 | | 0.5 | 0.5 |
| Spitfire | | 42.5 | 42.5 | | 38.5 | 38.5 | | 41.7 | 41.7 | | 0.7 | 0.7 |
| Forum | | 39.1 | 39.1 | | 27.4 | 27.4 | | 31.9 | 31.9 | | 2.7 | 2.7 |
| Griffon | | 43.2 | 43.2 | | 56.7 | 56.7 | | 67.9 | 67.9 | | 1.5 | 1.5 |
| Jagro | | 43.2 | 43.2 | | 57.0 | 57.0 | | 66.4 | 66.4 | | 0.0 | 0.0 |
| <i>Contado</i> | | 37.7 | 37.7 | | 38.4 | 38.4 | | 52.1 | 52.1 | | 0.0 | 0.0 |
| | | | | | | | | | | | | |
| Early Reds | | | | | | | | | | | | |
| <i>ABS 240</i> | | 42.0 | 42.0 | | 38.4 | 38.4 | | 38.3 | 38.3 | | 1.0 | 1.0 |
| | | | | | | | | | | | | |
| Maincrop Browns | | | | | | | | | | | | |
| Rumba | 38.0 | 42.6 | 40.3 | 60.0 | 53.0 | 56.5 | 83.3 | 62.6 | 73.0 | 0.6 | 0.3 | 0.4 |
| Sturon | 39.1 | 42.3 | 40.7 | 56.1 | 54.6 | 55.3 | 78.7 | 66.9 | 72.8 | 0.2 | 0.3 | 0.2 |
| Hercules | 37.5 | 40.3 | 38.9 | 36.6 | 43.6 | 40.1 | 51.1 | 54.0 | 52.6 | 0.0 | 0.9 | 0.4 |
| <i>Contado</i> | 32.7 | 36.8 | 34.8 | 29.0 | 40.3 | 34.7 | 44.7 | 60.5 | 52.6 | 1.9 | 0.2 | 1.1 |
| VCS 6004 | 40.1 | 42.4 | 41.2 | 45.8 | 39.8 | 42.8 | 57.6 | 47.1 | 52.3 | 0.5 | 0.3 | 0.4 |
| VCS 6005 | 39.7 | 43.7 | 41.7 | 49.8 | 44.9 | 47.3 | 66.7 | 53.3 | 60.0 | 0.5 | 0.5 | 0.5 |
| SturBC20 | 35.1 | 35.0 | 35.0 | 40.3 | 39.2 | 39.7 | 63.8 | 61.3 | 62.6 | 1.2 | 0.6 | 0.9 |
| | | | | | | | | | | | | |
| Maincrop Reds | | | | | | | | | | | | |
| Red Baron | 39.5 | 40.1 | 39.8 | 34.7 | 51.5 | 43.1 | 34.9 | 70.4 | 52.6 | 0.0 | 0.0 | 0.0 |
| Red Light F1 | 31.7 | 25.2 | 28.5 | 27.4 | 31.6 | 29.5 | 65.1 | 79.8 | 72.5 | 1.9 | 10.8 | 6.4 |
| Red Ray F1 | 35.1 | 32.7 | 33.9 | 25.3 | 35.8 | 30.6 | 21.1 | 62.8 | 42.0 | 0.0 | 4.3 | 2.1 |
| | | | | | | | | | | | | |

Table 3. NIAB Spring Planted Onion Trial from Sets 2016 - rots by category

Varieties in maturity order (mean of both sites)

| Variety | % Base Rots | | | % Neck Rots | | | % Bacterial Rots | | | % Penicillium | | |
|------------------------|-------------|-------|------|-------------|-------|------|------------------|-------|------|---------------|-------|------|
| | Lincs | Suffk | Mean | Lincs | Suffk | Mean | Lincs | Suffk | Mean | Lincs | Suffk | Mean |
| Early Browns | | | | | | | | | | | | |
| Troy | | 0.2 | 0.2 | | 0.5 | 0.5 | | 1.1 | 1.1 | | 0.2 | 0.2 |
| Alpha | | 0.0 | 0.0 | | 0.2 | 0.2 | | 0.0 | 0.0 | | 0.0 | 0.0 |
| <i>Vulcan 200</i> | | 0.2 | 0.2 | | 0.2 | 0.2 | | 0.2 | 0.2 | | 0.0 | 0.0 |
| Spitfire | | 0.2 | 0.2 | | 0.2 | 0.2 | | 0.3 | 0.3 | | 0.0 | 0.0 |
| Forum | | 0.0 | 0.0 | | 0.4 | 0.4 | | 3.0 | 3.0 | | 0.0 | 0.0 |
| Griffon | | 0.0 | 0.0 | | 0.3 | 0.3 | | 0.0 | 0.0 | | 0.0 | 0.0 |
| Jagro | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.3 | 0.3 | | 0.0 | 0.0 |
| <i>Contado</i> | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.2 | 0.2 | | 0.0 | 0.0 |
| | | | | | | | | | | | | |
| Early Reds | | | | | | | | | | | | |
| <i>ABS 240</i> | | 0.0 | 0.0 | | 0.2 | 0.2 | | 0.0 | 0.0 | | 0.0 | 0.0 |
| | | | | | | | | | | | | |
| Maincrop Browns | | | | | | | | | | | | |
| Rumba | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.8 | 0.2 | 1.0 | 0.2 | 0.0 | 0.1 |
| Sturon | 0.0 | 0.0 | 0.0 | 0.3 | 0.2 | 0.3 | 2.7 | 0.3 | 1.5 | 0.0 | 0.0 | 0.0 |
| Hercules | 2.2 | 0.0 | 1.1 | 1.0 | 0.0 | 0.5 | 4.7 | 0.0 | 2.4 | 0.0 | 0.0 | 0.0 |
| <i>Contado</i> | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.9 | 0.2 | 4.5 | 0.0 | 0.0 | 0.0 |
| VCS 6004 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.1 | 5.3 | 0.0 | 2.7 | 0.0 | 0.0 | 0.0 |
| VCS 6005 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.1 | 2.5 | 0.0 | 1.3 | 0.0 | 0.0 | 0.0 |
| SturBC20 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | 0.3 | 5.8 | 1.6 | 3.7 | 0.0 | 0.2 | 0.1 |
| | | | | | | | | | | | | |
| Maincrop Reds | | | | | | | | | | | | |
| Red Baron | 0.0 | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 4.2 | 0.0 | 2.1 | 0.2 | 0.0 | 0.1 |
| Red Light F1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.8 | 0.0 | 2.4 | 0.0 | 0.0 | 0.0 |
| Red Ray F1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.7 | 0.3 | 2.6 | 1.3 | 1.9 | 0.0 | 0.0 | 0.0 |
| | | | | | | | | | | | | |

Table 4. NIAB Spring Planted Onion Trial from Sets 2016 – Bulb quality data

Varieties in maturity order (mean of both sites)

| Variety | Neck Finish 1=fine 3=thick | | Skin Colour 1=pale 9=dark | | Skin Protection 1=poor 9=good | | Bulb Shape 1=flat 5=round 9=elongate | | Uniformity 1=poor 9=good | | Firmness 1=poor 9=good | |
|------------------------|-------------------------------|-------|------------------------------|-------|----------------------------------|-------|--|-------|-----------------------------|-------|---------------------------|-------|
| | Lincs | Suffk | Lincs | Suffk | Lincs | Suffk | Lincs | Suffk | Lincs | Suffk | Lincs | Suffk |
| Early Browns | | | | | | | | | | | | |
| Troy | | 1 | | 7 | | 5 | | 5.5 | | 6 | | 6 |
| Alpha | | 1 | | 7 | | 6 | | 6.5 | | 4 | | 7 |
| <i>Vulcan 200</i> | | 1 | | 6 | | 5 | | 5.5 | | 6 | | 6 |
| Spitfire | | 2 | | 6 | | 5 | | 5 | | 7 | | 5 |
| Forum | | 1 | | 7 | | 5 | | 5 | | 7 | | 6 |
| Griffon | | 2 | | 7 | | 6 | | 5.5 | | 6 | | 6 |
| Jagro | | 2 | | 8 | | 7 | | 5 | | 6 | | 7 |
| <i>Contado</i> | | 2 | | 7 | | 7 | | 5 | | 6 | | 7 |
| | | | | | | | | | | | | |
| Early Reds | | | | | | | | | | | | |
| <i>ABS 240</i> | | 1 | | 6 | | 6 | | 5 | | 5 | | 5 |
| | | | | | | | | | | | | |
| Maincrop Browns | | | | | | | | | | | | |
| Rumba | 3 | 3 | 6 | 7 | 6 | 6 | 4 | 5 | 5 | 7 | 6 | 5 |
| Sturon | 2 | 2 | 7 | 7 | 6 | 6 | 5 | 5 | 6 | 6 | 6 | 6 |
| Hercules | 2 | 2 | 7 | 8 | 6 | 7 | 5.5 | 5.5 | 6 | 5 | 6 | 7 |
| <i>Contado</i> | 2 | 2 | 7 | 7 | 6 | 6 | 5 | 5 | 6 | 6 | 5 | 7 |
| VCS 6004 | 2 | 2 | 7 | 7 | 6 | 5 | 4.5 | 5.5 | 6 | 5 | 4 | 7 |
| VCS 6005 | 2 | 2 | 7 | 6 | 6 | 5 | 4.5 | 5 | 7 | 7 | 5 | 7 |
| SturBC20 | 3 | 3 | 6 | 6 | 7 | 7 | 4.5 | 5 | 5 | 7 | 4 | 7 |
| | | | | | | | | | | | | |
| Maincrop Reds | | | | | | | | | | | | |
| Red Baron | 2 | 1 | 6 | 7 | 6 | 7 | 5 | 5 | 6 | 7 | 5 | 6 |
| Red Light F1 | 2 | 2 | 7 | 6 | 5 | 6 | 5.5 | 5 | 6 | 6 | 3 | 5 |
| Red Ray F1 | 2 | 2 | 7 | 7 | 6 | 7 | 5.5 | 5 | 6 | 7 | 4 | 6 |
| | | | | | | | | | | | | |

Table 5. NIAB Spring Planted Onion Trial from Sets 2016 – Onion Ring Data

Varieties in maturity order (mean of both sites)

| Variety | % bulbs with single centres | | |
|------------------------|-----------------------------|-------|-------|
| | Lincs | Suffk | Mean |
| Early Browns | | | |
| Troy | | 75.6 | 75.6 |
| Alpha | | 88.9 | 88.9 |
| <i>Vulcan 200</i> | | 86.7 | 86.7 |
| Spitfire | | 75.6 | 75.6 |
| Forum | | 65.0 | 65.0 |
| Griffon | | 53.3 | 53.3 |
| Jagro | | 44.4 | 44.4 |
| <i>Contado</i> | | 75.6 | 75.6 |
| | | | |
| Early Reds | | | |
| <i>ABS 240</i> | | 100.0 | 100.0 |
| | | | |
| Maincrop Browns | | | |
| Rumba | 66.7 | 53.3 | 60.0 |
| Sturon | 60.0 | 46.7 | 53.3 |
| Hercules | 93.3 | 80.0 | 86.7 |
| <i>Contado</i> | 82.2 | 75.6 | 78.9 |
| VCS 6004 | 82.2 | 86.7 | 84.4 |
| VCS 6005 | 71.1 | 73.3 | 72.2 |
| SturBC20 | 77.8 | 77.8 | 77.8 |
| | | | |
| Maincrop Reds | | | |
| Red Baron | 86.7 | 73.3 | 80.0 |
| Red Light F1 | 92.9 | 100 | 96.5 |
| Red Ray F1 | 90.0 | 76.7 | 83.3 |
| | | | |

**Table 6. NIAB Spring Planted Onion Trial from Sets 2016 – Storage data
(Ambient) Assessments Feb/Apr 2017**

| | February % sound | | | April % sound | | | Feb % sprouted | April |
|------------------------|---------------------|-----------|-----------|------------------|-----------|------|-------------------|-----------|
| | Lincs | Suffk | Mean | Lincs | Suffk | Mean | Lincs | Suffk |
| Maincrop Browns | | | | | | | | |
| Rumba | 33 | 86 | 86 | - | 41 | - | 17 | 9 |
| Sturon | 34 | 90 | 90 | - | 31 | - | 22 | 24 |
| Hercules | 13 | 48 | 48 | - | 11 | - | 21 | 21 |
| <i>Contado</i> | 29 | 88 | 88 | - | 23 | - | 9 | 16 |
| VCS 6004 | 15 | 84 | 84 | - | 35 | - | 13 | 14 |
| VCS 6005 | 42 | 81 | 81 | - | 23 | - | 15 | 19 |
| SturBC20 | 10 | 43 | 43 | - | 2 | - | 25 | 18 |
| mean | 25 | 74 | 74 | - | 24 | - | 17 | 17 |
| Maincrop Reds | | | | | | | | |
| Red Baron | 17 | 77 | 77 | - | 12 | - | 21 | 28 |
| Red light | 0 | 20 | 20 | - | 0 | - | 23 | 6 |
| Red Ray | 12 | 73 | 73 | - | 31 | - | 8 | 7 |
| mean | 10 | 57 | 57 | - | 14 | - | 17 | 14 |

**Table 7. NIAB Spring Planted Onion Trial from Sets 2016– Storage data
(Ambient) Assessments Feb/Apr 2017**

| Variety | firmness (1-9) 1=soft | | Total % rots | | |
|------------------------|-----------------------|----------------|--------------|-----------|-----------|
| | Lincs (Feb) | Suffk (Apr) | Lincs | Suffk | Mean |
| Maincrop Browns | | | | | |
| Rumba | 5.0 | 6.3 | 50 | 49 | 49 |
| Sturon | 5.0 | 6.0 | 44 | 45 | 45 |
| Hercules | 5.0 | 5.3 | 66 | 68 | 68 |
| <i>Contado</i> | 2.7 | 4.7 | 61 | 61 | 61 |
| VCS 6004 | 3.7 | 5.7 | 72 | 51 | 51 |
| VCS 6005 | 4.0 | 4.7 | 43 | 57 | 57 |
| SturBC20 | 2.7 | 5.0 | 65 | 80 | 80 |
| mean | 4.0 | 5.4 | 57 | 59 | 59 |
| Maincrop Reds | | | | | |
| Red Baron | 3.3 | 6.0 | 61 | 60 | 60 |
| Red light | 2.3 | 5.0 | 77 | 94 | 94 |
| Red Ray | 3.3 | 5.3 | 80 | 62 | 62 |
| mean | 3.0 | 5.4 | 73 | 72 | 72 |

Table 8. NIAB Spring Sown Onion Trials from seed 2016 – varieties

Sites: Rix (Essex) and Raker (Norfolk)

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

| Variety | Status | Source | Maturity | | |
|--------------------------|-------------|---------------------|------------------------------|---------------|---------------|
| | | | Date of 80% foliage fallover | | |
| | | | Essex | Norfolk | Mean |
| BROWNS | | | | | |
| <i>Euresco</i> | <i>P</i> | <i>Hazera</i> | <i>23-Aug</i> | <i>12-Aug</i> | <i>17-Aug</i> |
| <i>Drytan</i> | <i>P2</i> | <i>Bejo/DGS</i> | <i>19-Aug</i> | <i>19-Aug</i> | <i>19-Aug</i> |
| Hybound | R | Bejo/DGS | 20-Aug | 20-Aug | 20-Aug |
| Hytech | C | Bejo/DGS | 21-Aug | 20-Aug | 20-Aug |
| Hybing | C | Bejo/DGS | 22-Aug | 20-Aug | 21-Aug |
| RS 07751481 | 4 | Seminis | 21-Aug | 22-Aug | 21-Aug |
| Hypark | R | Bejo/DGS | 24-Aug | 19-Aug | 22-Aug |
| <i>Hytune</i> | <i>P2</i> | <i>Bejo/DGS</i> | <i>24-Aug</i> | <i>21-Aug</i> | <i>22-Aug</i> |
| SV3557ND | 3 | Seminis | 24-Aug | 21-Aug | 22-Aug |
| <i>SVND 0363</i> | <i>P</i> | <i>Seminis</i> | <i>26-Aug</i> | <i>21-Aug</i> | <i>23-Aug</i> |
| Vision | C | Syngenta | 27-Aug | 21-Aug | 24-Aug |
| <i>Ceresco</i> | <i>P</i> | <i>Hazera</i> | <i>03-Sep</i> | <i>15-Aug</i> | <i>24-Aug</i> |
| Rockito (SV3700ND) | 2 | Seminis | 24-Aug | 26-Aug | 25-Aug |
| SV8528ND | 1 | Seminis | 28-Aug | 22-Aug | 25-Aug |
| <i>Manesco</i> | <i>P</i> | <i>Hazera</i> | <i>05-Sep</i> | <i>15-Aug</i> | <i>25-Aug</i> |
| Paradiso | 4 | Hazera | 31-Aug | 25-Aug | 28-Aug |
| Centro | C | Hazera | 29-Aug | 27-Aug | 28-Aug |
| <i>SVND 0367</i> | <i>P</i> | <i>Seminis</i> | <i>29-Aug</i> | <i>28-Aug</i> | <i>28-Aug</i> |
| Medaillon | R | Syngenta | 01-Sep | 25-Aug | 28-Aug |
| <i>Sanjato (37-1003)</i> | <i>P</i> | <i>Hazera</i> | <i>01-Sep</i> | <i>28-Aug</i> | <i>30-Aug</i> |
| Motion | R | Syngenta | 01-Sep | 28-Aug | 30-Aug |
| <i>Hyfive</i> | <i>P2</i> | <i>Bejo/DGS</i> | <i>03-Sep</i> | <i>27-Aug</i> | <i>30-Aug</i> |
| <i>Hyway</i> | <i>P2</i> | <i>Bejo/DGS</i> | <i>31-Aug</i> | <i>30-Aug</i> | <i>30-Aug</i> |
| Hysky | 3 | Bejo/DGS | 31-Aug | 31-Aug | 31-Aug |
| SV1332ND | 1 | Seminis | 31-Aug | 01-Sep | 31-Aug |
| Chico | 4 | Hazera | 01-Sep | 04-Sep | 02-Sep |
| Santero | R | Hazera | 03-Sep | 03-Sep | 03-Sep |
| Means | | | 28-Aug | 24-Aug | 26-Aug |
| Red Light | 4 | Bejo/DGS | 18-Aug | 17-Aug | 17-Aug |
| <i>AF 219</i> | <i>P</i> | <i>Allium Farms</i> | <i>19-Aug</i> | <i>20-Aug</i> | <i>19-Aug</i> |
| <i>Red Planet</i> | <i>P(4)</i> | <i>Allium Farms</i> | <i>20-Aug</i> | <i>19-Aug</i> | <i>19-Aug</i> |
| <i>AF 111</i> | <i>P(2)</i> | <i>Allium Farms</i> | <i>22-Aug</i> | <i>21-Aug</i> | <i>21-Aug</i> |
| <i>AF 222</i> | <i>P(3)</i> | <i>Allium Farms</i> | <i>22-Aug</i> | <i>23-Aug</i> | <i>23-Aug</i> |
| Retano | R | Hazera | 23-Aug | 25-Aug | 24-Aug |
| <i>AF 175</i> | <i>P(3)</i> | <i>Allium Farms</i> | <i>25-Aug</i> | <i>26-Aug</i> | <i>25-Aug</i> |
| Red Tide | C | Bejo/DGS | 23-Aug | 28-Aug | 25-Aug |
| Redspark | R | Bejo/DGS | 28-Aug | 28-Aug | 28-Aug |
| Red Baron(A) | 1 | Allium Seeds | 29-Aug | 31-Aug | 30-Aug |
| 37-110 | 1 | Hazera | 04-Sep | 30-Aug | 02-Sep |
| Red Baron(E) | C | Bejo/DGS | 03-Sep | 31-Aug | 02-Sep |
| ABS 212 F1 | 1 | Allium Seeds | 04-Sep | 01-Sep | 02-Sep |
| Means | | | 25-Aug | 25-Aug | 25-Aug |

Table 9. NIAB Spring Sown Onion Trials from seed 2016- Yield data

Sites: Rix (Essex) and Raker (Norfolk)

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

| Variety | Population & Yield | | | | | | | | | | | |
|---------------------|-----------------------------|-------|------|-------------------------|-------|------|-------------------------|-------|------|------------------------------|-------|------|
| | plant pop. (plants / sq. m) | | | marketable yield (t/ha) | | | % bulbs by weight >60mm | | | total % defects (excl. rots) | | |
| | Rix | Raker | Mean | Rix | Raker | Mean | Rix | Raker | Mean | Rix | Raker | Mean |
| BROWNS | | | | | | | | | | | | |
| <i>Euresco</i> | 58.4 | 54.6 | 56.5 | 60.6 | 66.6 | 63.6 | 48.5 | 62.1 | 55.3 | 0.0 | 0.2 | 0.1 |
| <i>Drytan</i> | 62.4 | 55.7 | 59.1 | 71.0 | 67.4 | 69.2 | 57.6 | 63.1 | 60.3 | 0.0 | 0.0 | 0.0 |
| <i>Hybound</i> | 64.3 | 60.3 | 62.3 | 74.1 | 68.0 | 71.1 | 59.2 | 55.8 | 57.5 | 0.0 | 0.1 | 0.1 |
| <i>Hytech</i> | 62.6 | 53.3 | 57.9 | 87.8 | 77.8 | 82.8 | 75.1 | 80.7 | 77.9 | 0.2 | 0.0 | 0.1 |
| <i>Hybing</i> | 59.8 | 46.0 | 52.9 | 85.9 | 71.4 | 78.7 | 76.8 | 85.7 | 81.3 | 0.3 | 0.0 | 0.1 |
| <i>RS 07751481</i> | 59.9 | 54.2 | 57.0 | 81.8 | 72.6 | 77.2 | 75.6 | 74.0 | 74.8 | 0.4 | 0.1 | 0.2 |
| <i>Hypark</i> | 54.4 | 52.5 | 53.4 | 72.9 | 69.1 | 71.0 | 73.5 | 74.4 | 74.0 | 0.0 | 0.0 | 0.0 |
| <i>Hytune</i> | 57.8 | 52.7 | 55.2 | 79.9 | 84.4 | 82.1 | 71.0 | 86.1 | 78.5 | 0.0 | 0.0 | 0.0 |
| <i>SV3557ND</i> | 60.5 | 55.9 | 58.2 | 76.3 | 69.6 | 72.9 | 66.9 | 71.5 | 69.2 | 0.1 | 0.1 | 0.1 |
| <i>SVND 0363</i> | 62.3 | 54.0 | 58.1 | 73.3 | 64.2 | 68.8 | 63.9 | 66.1 | 65.0 | 0.0 | 0.0 | 0.0 |
| <i>Vision</i> | 54.1 | 57.3 | 55.7 | 75.0 | 71.7 | 73.3 | 75.1 | 71.1 | 73.1 | 0.0 | 0.1 | 0.1 |
| <i>Ceresco</i> | 51.0 | 47.7 | 49.3 | 54.2 | 55.8 | 55.0 | 51.6 | 66.1 | 58.9 | 0.5 | 0.0 | 0.2 |
| <i>Rockito</i> | 59.0 | 53.4 | 56.2 | 73.8 | 69.9 | 71.9 | 64.5 | 73.3 | 68.9 | 0.1 | 0.0 | 0.1 |
| <i>SV8528ND</i> | 60.0 | 56.0 | 58.0 | 79.1 | 68.1 | 73.6 | 73.8 | 66.2 | 70.0 | 0.0 | 0.3 | 0.1 |
| <i>Manesco</i> | 52.1 | 46.4 | 49.3 | 62.8 | 52.8 | 57.8 | 63.2 | 60.3 | 61.7 | 0.0 | 0.7 | 0.3 |
| <i>Paradiso</i> | 59.2 | 54.5 | 56.9 | 72.3 | 67.1 | 69.7 | 66.7 | 68.0 | 67.3 | 0.0 | 0.1 | 0.1 |
| <i>Centro</i> | 55.9 | 48.8 | 52.3 | 79.7 | 69.9 | 74.8 | 80.0 | 78.5 | 79.2 | 0.3 | 0.0 | 0.1 |
| <i>SVND 0367</i> | 56.9 | 51.5 | 54.2 | 65.1 | 65.4 | 65.2 | 57.0 | 76.4 | 66.7 | 0.2 | 0.0 | 0.1 |
| <i>Medaillon</i> | 52.1 | 50.6 | 51.3 | 78.3 | 65.0 | 71.7 | 82.6 | 69.1 | 75.8 | 0.0 | 0.1 | 0.1 |
| <i>Sanjato</i> | 50.4 | 45.1 | 47.8 | 81.7 | 63.7 | 72.7 | 86.2 | 77.7 | 81.9 | 0.0 | 0.0 | 0.0 |
| <i>Motion</i> | 61.0 | 56.2 | 58.6 | 80.4 | 71.9 | 76.2 | 72.8 | 69.2 | 71.0 | 0.0 | 0.0 | 0.0 |
| <i>Hyfive</i> | 63.7 | 53.4 | 58.6 | 72.5 | 71.3 | 71.9 | 58.6 | 73.1 | 65.8 | 0.2 | 0.0 | 0.1 |
| <i>Hyway</i> | 57.6 | 43.8 | 50.7 | 75.5 | 66.7 | 71.1 | 71.8 | 85.1 | 78.5 | 0.0 | 0.0 | 0.0 |
| <i>Hysky</i> | 61.4 | 51.8 | 56.6 | 74.0 | 68.2 | 71.1 | 60.9 | 72.7 | 66.8 | 0.1 | 0.1 | 0.1 |
| <i>SV1332ND</i> | 59.6 | 55.2 | 57.4 | 76.9 | 68.4 | 72.6 | 70.0 | 67.0 | 68.5 | 0.4 | 0.0 | 0.2 |
| <i>Chico</i> | 58.9 | 51.8 | 55.4 | 73.8 | 62.5 | 68.1 | 70.8 | 67.2 | 69.0 | 0.2 | 0.1 | 0.2 |
| <i>Santero</i> | 49.3 | 46.8 | 48.1 | 77.5 | 67.5 | 72.5 | 85.2 | 81.4 | 83.3 | 0.3 | 0.2 | 0.2 |
| Means | 58.0 | 52.2 | 55.1 | 74.7 | 68.0 | 71.4 | 68.9 | 71.9 | 70.4 | 0.1 | 0.1 | 0.1 |
| REDS | | | | | | | | | | | | |
| <i>Red Light</i> | 55.7 | 50.1 | 52.9 | 80.5 | 71.5 | 76.0 | 77.8 | 81.1 | 79.5 | 0.0 | 0.0 | 0.0 |
| <i>AF 219</i> | 49.7 | 43.3 | 46.5 | 68.5 | 56.1 | 62.3 | 76.2 | 75.9 | 76.1 | 0.0 | 0.3 | 0.1 |
| <i>Red Planet</i> | 44.6 | 39.7 | 42.1 | 60.3 | 56.4 | 58.4 | 73.4 | 68.6 | 71.0 | 0.0 | 0.8 | 0.4 |
| <i>AF 111</i> | 47.0 | 40.2 | 43.6 | 62.4 | 51.5 | 56.9 | 70.4 | 73.3 | 71.8 | 0.0 | 0.3 | 0.1 |
| <i>AF 222</i> | 34.2 | 41.7 | 38.0 | 49.0 | 61.0 | 55.0 | 79.2 | 80.5 | 79.9 | 0.0 | 0.0 | 0.0 |
| <i>Retano</i> | 47.7 | 43.1 | 45.4 | 62.8 | 54.7 | 58.8 | 72.8 | 64.2 | 68.5 | 0.2 | 0.2 | 0.2 |
| <i>AF 175</i> | 50.2 | 46.2 | 48.2 | 67.4 | 58.4 | 62.9 | 78.5 | 72.4 | 75.4 | 0.0 | 0.0 | 0.0 |
| <i>Red Tide</i> | 45.5 | 42.7 | 44.1 | 68.2 | 58.1 | 63.1 | 80.9 | 75.1 | 78.0 | 0.0 | 0.0 | 0.0 |
| <i>Redspark</i> | 50.7 | 43.5 | 47.1 | 66.7 | 55.8 | 61.2 | 70.4 | 73.7 | 72.0 | 0.1 | 0.3 | 0.2 |
| <i>Red Baron(A)</i> | 51.4 | 49.4 | 50.4 | 66.8 | 57.4 | 62.1 | 69.8 | 61.4 | 65.6 | 0.1 | 0.3 | 0.2 |

| | | | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|-----|-----|-----|
| 37-110 | 48.7 | 43.9 | 46.3 | 52.9 | 47.1 | 50.0 | 57.4 | 57.9 | 57.7 | 0.3 | 0.0 | 0.1 |
| Red Baron(E) | 51.9 | 48.1 | 50.0 | 68.2 | 59.4 | 63.8 | 75.7 | 69.5 | 72.6 | 0.9 | 0.1 | 0.5 |
| ABS 212 F1 | 47.5 | 46.6 | 47.0 | 62.9 | 53.4 | 58.2 | 70.5 | 57.7 | 64.1 | 0.6 | 0.0 | 0.3 |
| Means | 48.1 | 44.5 | 46.3 | 64.4 | 57.0 | 60.7 | 73.3 | 70.1 | 71.7 | 0.2 | 0.2 | 0.2 |

Table 10. NIAB Spring Sown Onion Trials from seed 2016- rots by category

Sites: Rix (Essex) and Raker (Norfolk)

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

| | Population & Yield | | | | | | | | | | | |
|---------------|--------------------|-------|------|-------------|-------|------|------------------|-------|------|---------------|-------|------|
| Variety | % Base Rots | | | % Neck Rots | | | % bacterial rots | | | % Penicillium | | |
| | Rix | Raker | Mean | Rix | Raker | Mean | Rix | Raker | Mean | Rix | Raker | Mean |
| BROWNS | | | | | | | | | | | | |
| Euresco | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Drytan | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.1 | 0.0 | 0.0 | 0.0 |
| Hybound | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 |
| Hytech | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 |
| Hybing | 0.1 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 |
| RS 07751481 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 |
| Hypark | 0.3 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 | 0.1 | 0.0 | 0.0 | 0.0 |
| Hytune | 0.4 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| SV3557ND | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 |
| SVND 0363 | 0.0 | 0.2 | 0.1 | 0.0 | 0.2 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Vision | 0.4 | 0.0 | 0.2 | 0.0 | 0.1 | 0.1 | 0.4 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 |
| Ceresco | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rockito | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 |
| SV8528ND | 0.2 | 0.3 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 |
| Manesco | 0.2 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Paradiso | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Centro | 0.2 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.5 | 0.0 | 0.3 | 0.0 | 0.1 | 0.1 |
| SVND 0367 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.1 |
| Medaillon | 0.3 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Sanjato | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.1 | 0.2 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 |
| Motion | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 |
| Hyfive | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hyway | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hysky | 0.0 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| SV1332ND | 0.2 | 0.1 | 0.2 | 0.0 | 0.0 | 0.0 | 0.2 | 0.1 | 0.2 | 0.0 | 0.0 | 0.0 |
| Chico | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 |
| Santero | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Means | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 |
| REDS | | | | | | | | | | | | |
| Red Light | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| AF 219 | 0.4 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.0 | 0.0 | 0.0 |
| Red Planet | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | 0.3 | 0.5 | 0.6 | 0.0 | 0.3 |
| AF 111 | 0.0 | 0.3 | 0.1 | 0.0 | 0.0 | 0.0 | 0.7 | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 |
| AF 222 | 0.8 | 0.0 | 0.4 | 0.0 | 0.3 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Retano | 0.2 | 0.2 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| AF 175 | 0.2 | 0.7 | 0.5 | 0.0 | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.0 | 0.0 | 0.0 |
| Red Tide | 0.3 | 0.0 | 0.2 | 0.1 | 0.0 | 0.1 | 0.3 | 0.0 | 0.1 | 0.2 | 0.0 | 0.1 |
| Redspark | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.1 | 0.6 | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 |

| | | | | | | | | | | | | |
|--------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Red Baron(A) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 |
| 37-110 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 |
| Red Baron(E) | 0.2 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.1 | 0.0 | 0.0 | 0.0 |
| ABS 212 F1 | 0.0 | 0.2 | 0.1 | 0.0 | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.0 | 0.1 |
| Means | 0.2 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.2 | 0.1 | 0.2 | 0.1 | 0.0 | 0.0 |

Table 11. NIAB Spring Onion Trials from seed 2016 – Bulb Quality data

Sites: Rix (Essex) and Raker (Norfolk)

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

| | Bulb Quality (1-9) | | | | | | | | | | | | | | |
|---------------|------------------------------|------------|------------|----------------------------------|------------|------------|---|------------|------------|-----------------------------|------------|------------|------------------------|------------|------------|
| Variety | Skin Colour 1=pale 9=dark | | | Skin Protection 1=poor 9=good | | | Bulb Shape 1=flat 5=round 9=elongate | | | Uniformity 1=poor 9=good | | | Firmness 1=poor 9=good | | |
| | Rix | Raker | Av | Rix | Raker | Av | Rix | Raker | Av | Rix | Raker | Av | Rix | Raker | Av |
| BROWNS | | | | | | | | | | | | | | | |
| Euresco | 7.0 | 6.0 | 6.5 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 6.0 | 5.5 | 6.0 | 7.0 | 6.5 |
| Drytan | 7.0 | 8.0 | 7.5 | 7.0 | 7.0 | 7.0 | 5.5 | 5.0 | 5.3 | 6.0 | 8.0 | 7.0 | 7.0 | 8.0 | 7.5 |
| Hybound | 6.0 | 7.0 | 6.5 | 6.0 | 7.0 | 6.5 | 5.0 | 5.0 | 5.0 | 6.0 | 8.0 | 7.0 | 8.0 | 8.0 | 8.0 |
| Hytech | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 5.0 | 5.0 | 5.0 | 7.0 | 7.0 | 7.0 | 8.0 | 8.0 | 8.0 |
| Hybing | 5.0 | 5.0 | 5.0 | 7.0 | 6.0 | 6.5 | 5.0 | 5.0 | 5.0 | 6.0 | 7.0 | 6.5 | 8.0 | 8.0 | 8.0 |
| RS 07751481 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 5.0 | 5.0 | 5.0 | 6.0 | 7.0 | 6.5 | 7.0 | 8.0 | 7.5 |
| Hypark | 6.0 | 6.0 | 6.0 | 6.0 | 7.0 | 6.5 | 5.0 | 5.0 | 5.0 | 7.0 | 7.0 | 7.0 | 7.0 | 8.0 | 7.5 |
| Hytune | 7.0 | 6.0 | 6.5 | 7.0 | 6.0 | 6.5 | 5.5 | 5.0 | 5.3 | 6.0 | 8.0 | 7.0 | 8.0 | 8.0 | 8.0 |
| SV3557ND | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 5.0 | 5.0 | 5.0 | 7.0 | 8.0 | 7.5 | 8.0 | 8.0 | 8.0 |
| SVND 0363 | 7.0 | 6.0 | 6.5 | 7.0 | 7.0 | 7.0 | 5.0 | 5.0 | 5.0 | 7.0 | 7.0 | 7.0 | 8.0 | 8.0 | 8.0 |
| Vision | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 5.0 | 5.0 | 5.0 | 7.0 | 8.0 | 7.5 | 7.0 | 8.0 | 7.5 |
| Ceresco | 8.0 | 8.0 | 8.0 | 6.0 | 7.0 | 6.5 | 5.0 | 5.0 | 5.0 | 7.0 | 6.0 | 6.5 | 7.0 | 7.0 | 7.0 |
| Rockito | 6.0 | 7.0 | 6.5 | 7.0 | 7.0 | 7.0 | 5.0 | 5.0 | 5.0 | 7.0 | 7.0 | 7.0 | 8.0 | 8.0 | 8.0 |
| SV8528ND | 7.0 | 7.0 | 7.0 | 7.0 | 6.0 | 6.5 | 5.0 | 5.0 | 5.0 | 7.0 | 7.0 | 7.0 | 8.0 | 8.0 | 8.0 |
| Manesco | 8.0 | 8.0 | 8.0 | 6.0 | 5.0 | 5.5 | 5.0 | 5.0 | 5.0 | 7.0 | 7.0 | 7.0 | 7.0 | 8.0 | 7.5 |
| Paradiso | 7.0 | 7.0 | 7.0 | 7.0 | 6.0 | 6.5 | 5.0 | 5.0 | 5.0 | 7.0 | 7.0 | 7.0 | 8.0 | 8.0 | 8.0 |
| Centro | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 5.0 | 5.0 | 5.0 | 7.0 | 7.0 | 7.0 | 8.0 | 8.0 | 8.0 |
| SVND 0367 | 6.0 | 7.0 | 6.5 | 7.0 | 7.0 | 7.0 | 5.0 | 5.0 | 5.0 | 7.0 | 7.0 | 7.0 | 8.0 | 8.0 | 8.0 |
| Medaillon | 6.0 | 7.0 | 6.5 | 7.0 | 7.0 | 7.0 | 5.0 | 5.0 | 5.0 | 7.0 | 7.0 | 7.0 | 8.0 | 8.0 | 8.0 |
| Sanjato | 5.0 | 6.0 | 5.5 | 6.0 | 6.0 | 6.0 | 5.0 | 4.5 | 4.8 | 7.0 | 7.0 | 7.0 | 8.0 | 8.0 | 8.0 |
| Motion | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 5.0 | 5.0 | 5.0 | 7.0 | 8.0 | 7.5 | 8.0 | 8.0 | 8.0 |
| Hyfive | 7.0 | 6.0 | 6.5 | 6.0 | 5.0 | 5.5 | 5.0 | 5.0 | 5.0 | 7.0 | 7.0 | 7.0 | 8.0 | 8.0 | 8.0 |
| Hyway | 6.0 | 6.0 | 6.0 | 7.0 | 6.0 | 6.5 | 5.0 | 5.0 | 5.0 | 6.0 | 7.0 | 6.5 | 8.0 | 8.0 | 8.0 |
| Hysky | 7.0 | 7.0 | 7.0 | 6.0 | 7.0 | 6.5 | 5.0 | 5.0 | 5.0 | 7.0 | 7.0 | 7.0 | 8.0 | 8.0 | 8.0 |
| SV1332ND | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 5.0 | 5.0 | 5.0 | 6.0 | 7.0 | 6.5 | 8.0 | 8.0 | 8.0 |
| Chico | 6.0 | 7.0 | 6.5 | 7.0 | 7.0 | 7.0 | 5.5 | 5.0 | 5.3 | 6.0 | 6.0 | 6.0 | 8.0 | 8.0 | 8.0 |
| Santero | 6.0 | 7.0 | 6.5 | 6.0 | 7.0 | 6.5 | 5.0 | 5.0 | 5.0 | 7.0 | 7.0 | 7.0 | 8.0 | 8.0 | 8.0 |
| Means | 6.6 | 6.7 | 6.7 | 6.6 | 6.5 | 6.6 | 5.1 | 5.0 | 5.0 | 6.6 | 7.1 | 6.9 | 7.7 | 7.9 | 7.8 |
| REDS | | | | | | | | | | | | | | | |
| Red Light | 8.0 | 8.0 | 8.0 | 5.0 | 4.0 | 4.5 | 5.0 | 5.0 | 5.0 | 7.0 | 5.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| AF 219 | 6.0 | 6.0 | 6.0 | 6.0 | 5.0 | 5.5 | 5.0 | 5.0 | 5.0 | 6.0 | 6.0 | 6.0 | 7.0 | 7.0 | 7.0 |
| Red Planet | 7.0 | 7.0 | 7.0 | 7.0 | 5.0 | 6.0 | 5.0 | 5.0 | 5.0 | 7.0 | 6.0 | 6.5 | 7.0 | 8.0 | 7.5 |
| AF 111 | 6.0 | 7.0 | 6.5 | 5.0 | 6.0 | 5.5 | 5.0 | 4.5 | 4.8 | 6.0 | 6.0 | 6.0 | 8.0 | 8.0 | 8.0 |
| AF 222 | 6.0 | 7.0 | 6.5 | 7.0 | 6.0 | 6.5 | 5.0 | 4.5 | 4.8 | 6.0 | 6.0 | 6.0 | 7.0 | 8.0 | 7.5 |
| Retano | 8.0 | 8.0 | 8.0 | 6.0 | 6.0 | 6.0 | 5.0 | 4.5 | 4.8 | 7.0 | 7.0 | 7.0 | 8.0 | 8.0 | 8.0 |
| AF 175 | 7.0 | 7.0 | 7.0 | 6.0 | 5.0 | 5.5 | 5.0 | 5.0 | 5.0 | 7.0 | 6.0 | 6.5 | 8.0 | 8.0 | 8.0 |

| | | | | | | | | | | | | | | | |
|--------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Red Tide | 8.0 | 7.0 | 7.5 | 6.0 | 7.0 | 6.5 | 5.5 | 5.0 | 5.3 | 6.0 | 6.0 | 6.0 | 7.0 | 7.0 | 7.0 |
| Redspark | 8.0 | 7.0 | 7.5 | 6.0 | 6.0 | 6.0 | 5.0 | 5.0 | 5.0 | 6.0 | 6.0 | 6.0 | 7.0 | 7.0 | 7.0 |
| Red Baron(A) | 7.0 | 7.0 | 7.0 | 6.0 | 6.0 | 6.0 | 5.0 | 5.0 | 5.0 | 7.0 | 6.0 | 6.5 | 7.0 | 8.0 | 7.5 |
| 37-110 | 7.0 | 6.0 | 6.5 | 5.0 | 6.0 | 5.5 | 5.5 | 5.0 | 5.3 | 7.0 | 6.0 | 6.5 | 6.0 | 7.0 | 6.5 |
| Red Baron(E) | 7.0 | 8.0 | 7.5 | 6.0 | 7.0 | 6.5 | 5.0 | 5.0 | 5.0 | 6.0 | 6.0 | 6.0 | 7.0 | 7.0 | 7.0 |
| ABS 212 F1 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 5.0 | 5.0 | 5.0 | 7.0 | 5.0 | 6.0 | 7.0 | 8.0 | 7.5 |
| Means | 7.1 | 7.1 | 7.1 | 6.0 | 5.8 | 5.9 | 5.1 | 4.9 | 5.0 | 6.5 | 5.9 | 6.2 | 7.1 | 7.5 | 7.3 |

Table 12. NIAB Spring Sown Trials from seed 2016 – vigour and plant characteristics

Sites: Rix (Essex) and Raker (Norfolk)

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

Both trials had a full fungicide programme so mildew is only recorded as present or absent at Norfolk and as the maximum percentage recorded in Essex

| | Early vigour 1-9 9=vigorous | | | Establishment % | | | Mildew (July) 0-3 3= very severe | | |
|---------------|--------------------------------|------------|------------|--------------------|-------|------|-------------------------------------|------------|------------|
| variety | Rix | Raker | Mean | Rix | Raker | Mean | Rix | Raker | Mean |
| BROWNS | | | | | | | | | |
| Euresco | 7.5 | 7.0 | 7.3 | >90% | >90% | >90% | 3.0 | 3.0 | 3.0 |
| Drytan | 7.5 | 7.5 | 7.5 | >90% | >90% | >90% | 2.0 | 1.5 | 1.8 |
| Hybound | 7.3 | 7.0 | 7.2 | >90% | >90% | >90% | 1.7 | 1.0 | 1.3 |
| Hytech | 7.3 | 7.0 | 7.2 | >90% | >90% | >90% | 1.3 | 1.2 | 1.3 |
| Hybing | 7.0 | 7.7 | 7.3 | >90% | >90% | >90% | 1.3 | 1.3 | 1.3 |
| RS 07751481 | 8.0 | 7.0 | 7.5 | >90% | >90% | >90% | 1.3 | 1.0 | 1.2 |
| Hypark | 7.0 | 7.0 | 7.0 | >90% | >90% | >90% | 1.3 | 1.5 | 1.4 |
| Hytune | 7.5 | 7.5 | 7.5 | >90% | >90% | >90% | 1.5 | 1.5 | 1.5 |
| SV3557ND | 7.7 | 7.3 | 7.5 | >90% | >90% | >90% | 1.7 | 1.5 | 1.6 |
| SVND 0363 | 7.5 | 7.0 | 7.3 | >90% | >90% | >90% | 1.0 | 1.0 | 1.0 |
| Vision | 7.3 | 7.0 | 7.2 | >90% | >90% | >90% | 1.0 | 1.0 | 1.0 |
| Ceresco | 7.5 | 7.0 | 7.3 | >90% | >90% | >90% | 3.0 | 3.0 | 3.0 |
| Rockito | 7.0 | 7.0 | 7.0 | >90% | >90% | >90% | 1.3 | 1.0 | 1.2 |
| SV8528ND | 7.3 | 7.0 | 7.2 | >90% | >90% | >90% | 1.0 | 1.3 | 1.2 |
| Manesco | 7.5 | 7.0 | 7.3 | >90% | >90% | >90% | 3.0 | 3.0 | 3.0 |
| Paradiso | 7.0 | 7.0 | 7.0 | >90% | >90% | >90% | 1.7 | 1.0 | 1.3 |
| Centro | 8.0 | 7.7 | 7.8 | >90% | >90% | >90% | 1.3 | 1.3 | 1.3 |
| SVND 0367 | 7.5 | 7.0 | 7.3 | >90% | >90% | >90% | 1.0 | 1.0 | 1.0 |
| Medaillon | 7.0 | 7.0 | 7.0 | >90% | >90% | >90% | 1.0 | 1.3 | 1.2 |
| Sanjato | 7.0 | 7.0 | 7.0 | >90% | >90% | >90% | 0.2 | 0.6 | 0.4 |
| Motion | 7.7 | 7.3 | 7.5 | >90% | >90% | >90% | 1.7 | 1.3 | 1.5 |
| Hyfive | 8.0 | 7.0 | 7.5 | >90% | >90% | >90% | 2.0 | 2.0 | 2.0 |
| Hyway | 8.0 | 7.0 | 7.5 | >90% | 85% | >90% | 1.5 | 1.5 | 1.5 |
| Hysky | 7.0 | 7.7 | 7.3 | >90% | >90% | >90% | 2.0 | 2.3 | 2.2 |
| SV1332ND | 7.3 | 7.0 | 7.2 | >90% | >90% | >90% | 1.3 | 1.5 | 1.4 |
| Chico | 7.0 | 7.0 | 7.0 | >90% | >90% | >90% | 1.0 | 1.3 | 1.2 |
| Santero | 7.0 | 7.0 | 7.0 | >90% | >90% | >90% | 0.4 | 0.1 | 0.3 |
| Means | 7.4 | 7.1 | 7.3 | | | | 1.5 | 1.5 | 1.5 |
| REDS | | | | | | | | | |
| Red Light | 8.0 | 8.0 | 8.0 | >90% | >90% | >90% | 2.0 | 2.3 | 2.2 |
| AF 219 | 7.5 | 8.0 | 7.8 | >90% | >90% | >90% | 2.0 | 2.0 | 2.0 |
| Red Planet | 7.0 | 7.5 | 7.3 | >90% | >90% | >90% | 2.0 | 1.5 | 1.8 |
| AF 111 | 8.0 | 7.5 | 7.8 | >90% | >90% | >90% | 2.3 | 2.3 | 2.3 |
| AF 222 | 8.0 | 8.0 | 8.0 | >90% | >90% | >90% | 2.0 | 2.0 | 2.0 |
| Retano | 8.0 | 7.7 | 7.8 | >90% | >90% | >90% | 1.3 | 1.8 | 1.6 |
| AF 175 | 8.0 | 8.0 | 8.0 | >90% | >90% | >90% | 2.0 | 1.8 | 1.9 |
| Red Tide | 7.7 | 7.3 | 7.5 | >90% | >90% | >90% | 1.5 | 2.5 | 2.0 |

| | | | | | | | | | |
|--------------|------------|------------|------------|------|------|------|------------|------------|------------|
| Redspark | 7.7 | 7.0 | 7.3 | >90% | >90% | >90% | 2.2 | 2.5 | 2.3 |
| Red Baron(A) | 7.7 | 7.0 | 7.3 | >90% | >90% | >90% | 1.8 | 2.5 | 2.2 |
| 37-110 | 7.0 | 7.0 | 7.0 | >90% | >90% | >90% | 2.3 | 2.8 | 2.6 |
| Red Baron(E) | 7.7 | 7.0 | 7.3 | >90% | >90% | >90% | 1.8 | 2.5 | 2.2 |
| ABS 212 F1 | 7.3 | 7.0 | 7.2 | >90% | >90% | >90% | 1.7 | 2.2 | 1.9 |
| Means | 7.7 | 7.5 | 7.6 | | | | 1.9 | 2.2 | 2.0 |

Table 13. NIAB Spring Sown Onion Trials from seed 2016 - Onion Ring Data

Sites: Rix (Essex) and Raker (Norfolk)

Varieties in maturity order (mean of both sites)

Preliminary varieties 2 replicates of data

| | % Bulbs with single centres | | |
|---------------|-----------------------------|-------------|------|
| Variety | Essex | Norfolk | Mean |
| BROWNS | | | |
| Euresco | 80.0 | 90.0 | 85.0 |
| Drytan | 86.7 | 86.7 | 86.7 |
| Hybound | 97.8 | 86.7 | 92.2 |
| Hytech | 80.0 | 93.3 | 86.7 |
| Hybing | 75.6 | 84.4 | 80.0 |
| RS 07751481 | 64.4 | 60.0 | 62.2 |
| Hypark | 75.6 | 84.4 | 80.0 |
| Hytune | 86.7 | 90.0 | 88.3 |
| SV3557ND | 75.6 | 84.4 | 80.0 |
| SVND 0363 | 56.7 | 66.7 | 61.7 |
| Vision | 53.3 | 51.1 | 52.2 |
| Ceresco | 76.7 | 86.7 | 81.7 |
| Rockito | 86.7 | 80.0 | 83.3 |
| SV8528ND | 73.3 | 68.9 | 71.1 |
| Manesco | 73.3 | 90.0 | 81.7 |
| Paradiso | 48.9 | 95.6 | 72.2 |
| Centro | 84.4 | 62.2 | 73.3 |
| SVND 0367 | 93.3 | 90.0 | 91.7 |
| Medaillon | 71.1 | 93.3 | 82.2 |
| Sanjato | 50.0 | 63.3 | 56.7 |
| Motion | 84.4 | 77.8 | 81.1 |
| Hyfive | 90.0 | 76.7 | 83.3 |
| Hyway | 96.7 | 93.3 | 95.0 |
| Hysky | 86.7 | 75.6 | 81.1 |
| SV1332ND | 88.9 | 88.9 | 88.9 |
| Chico | 84.4 | 91.1 | 87.8 |
| Santero | 73.3 | 88.9 | 81.1 |
| Means | 77.6 | 81.5 | 79.5 |
| REDS | | | |
| Red Light | 60.0 | 62.2 | 61.1 |
| AF 219 | 73.3 | 76.7 | 75.0 |
| Red Planet | 66.7 | 63.3 | 65.0 |
| AF 111 | 93.3 | 93.3 | 93.3 |
| AF 222 | 73.0 | 93.3 | 83.2 |

| | | | |
|--------------|------|-------------|------|
| Retano | 60.0 | 84.4 | 72.2 |
| AF 175 | 70.0 | 80.0 | 75.0 |
| Red Tide | 62.2 | 70.0 | 66.1 |
| Redspark | 68.9 | 64.4 | 66.7 |
| Red Baron(A) | 55.6 | 64.4 | 60.0 |
| 37-110 | 66.7 | 68.9 | 67.8 |
| Red Baron(E) | 76.7 | 82.2 | 79.4 |
| ABS 212 F1 | 46.7 | 71.1 | 58.9 |
| Means | 67.2 | 75.0 | 71.1 |

Table 14. NIAB Spring Sown Onion Trials from seed 2016 – Storage data (Ambient) Assessments April/May 2017

Sites: Rix (Essex) and Raker (Norfolk)

Varieties in maturity order (mean of both sites)

Preliminary varieties 2 replicates of data

| Variety | % sound Late April | | | % sound Late May | | | % sound CE storage late July |
|---------------|-----------------------|-----------|-----------|---------------------|-----------|-----------|---------------------------------|
| | Rix | Raker | Mean | Rix | Raker | Mean | Rix |
| BROWNS | | | | | | | |
| Euresco | 47 | 6 | 27 | 18 | 0 | 9 | 6 |
| Drytan | 94 | 88 | 91 | 65 | 40 | 53 | 61 |
| Hybound | 87 | 82 | 85 | 46 | 30 | 38 | 40 |
| Hytech | 72 | 65 | 69 | 26 | 11 | 19 | 35 |
| Hybing | 80 | 75 | 78 | 37 | 27 | 32 | 43 |
| RS 07751481 | 65 | 56 | 61 | 25 | 9 | 17 | 12 |
| Hypark | 75 | 65 | 70 | 32 | 15 | 23 | 25 |
| Hytune | 79 | 74 | 76 | 50 | 20 | 35 | 66 |
| SV3557ND | 86 | 80 | 83 | 40 | 37 | 38 | 33 |
| SVND 0363 | 81 | 75 | 78 | 41 | 22 | 32 | 60 |
| Vision | 89 | 83 | 86 | 50 | 24 | 37 | 43 |
| Ceresco | 53 | 40 | 47 | 24 | 13 | 19 | 26 |
| Rockito | 77 | 73 | 75 | 38 | 20 | 29 | 16 |
| SV8528ND | 80 | 67 | 74 | 42 | 23 | 33 | 38 |
| Manesco | 63 | 45 | 54 | 27 | 12 | 20 | 23 |
| Paradiso | 85 | 81 | 83 | 53 | 38 | 45 | 24 |
| Centro | 76 | 69 | 73 | 26 | 26 | 26 | 18 |
| SVND 0367 | 91 | 83 | 87 | 57 | 35 | 46 | 54 |
| Medaillon | 97 | 92 | 94 | 58 | 37 | 47 | 60 |
| Sanjato | 91 | 80 | 85 | 58 | 25 | 42 | 22 |
| Motion | 93 | 88 | 90 | 54 | 29 | 41 | 36 |
| Hyfive | 86 | 71 | 79 | 32 | 15 | 23 | 39 |
| Hyway | 95 | 85 | 90 | 52 | 41 | 47 | 60 |
| Hysky | 94 | 87 | 90 | 49 | 45 | 47 | 64 |
| SV1332ND | 81 | 70 | 75 | 31 | 16 | 24 | 17 |
| Chico | 88 | 83 | 85 | 55 | 44 | 49 | 43 |
| Santero | 60 | 73 | 66 | 25 | 16 | 21 | 14 |
| Means | 80 | 72 | 76 | 41 | 25 | 33 | 36 |
| REDS | | | | | | | |

| | | | | | | | |
|--------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Red Light | 27 | 17 | 22 | 15 | 4 | 10 | 34 |
| AF 219 | 79 | 85 | 82 | 57 | 49 | 53 | 46 |
| Red Planet | 75 | 63 | 69 | 31 | 20 | 25 | 14 |
| AF 111 | 79 | 50 | 64 | 33 | 13 | 23 | 34 |
| AF 222 | 81 | 74 | 77 | 33 | 38 | 36 | 21 |
| Retano | 81 | 79 | 80 | 22 | 20 | 21 | 36 |
| AF 175 | 90 | 85 | 87 | 75 | 56 | 66 | 50 |
| Red Tide | 90 | 79 | 85 | 49 | 34 | 41 | 72 |
| Redspark | 74 | 66 | 70 | 28 | 22 | 25 | 25 |
| Red Baron(A) | 72 | 65 | 69 | 24 | 27 | 25 | 30 |
| 37-110 | 57 | 56 | 57 | 23 | 15 | 19 | 11 |
| Red Baron(E) | 74 | 59 | 67 | 35 | 19 | 27 | 31 |
| ABS 212 F1 | 84 | 76 | 80 | 51 | 35 | 43 | 36 |
| Means | 74 | 66 | 70 | 37 | 27 | 32 | 34 |

Table 15. NIAB Spring Sown Onion Trials from seed 2016 – Storage data
(Ambient) Assessments April/May 2017 (CE late July 2017)

Sites: Rix (Essex) and Raker (Norfolk)

Varieties in maturity order (mean of both sites)

Preliminary varieties 2 replicates of data

| Variety | firmness (1-9) 1=soft Late April | | | Total % rots Late May | | |
|---------------|-------------------------------------|-------|-----|--------------------------|-------|----|
| | Rix | Raker | CE | Rix | Raker | CE |
| BROWNS | | | | | | |
| Euresco | 6.5 | 6.0 | 3.5 | 11 | 25 | 7 |
| Drytan | 7.5 | 5.5 | 7.5 | 0 | 5 | 1 |
| Hybound | 6.0 | 7.3 | 8.0 | 3 | 3 | 1 |
| Hytech | 7.0 | 7.0 | 6.0 | 4 | 4 | 2 |
| Hybing | 7.0 | 6.3 | 6.5 | 3 | 1 | 0 |
| RS 07751481 | 5.7 | 6.0 | 7.5 | 3 | 7 | 3 |
| Hypark | 6.7 | 6.3 | 7.0 | 1 | 2 | 1 |
| Hytune | 6.5 | 6.0 | 8.0 | 9 | 6 | 2 |
| SV3557ND | 7.7 | 6.3 | 7.0 | 3 | 3 | 2 |
| SVND 0363 | 6.5 | 6.5 | 7.0 | 2 | 0 | 1 |
| Vision | 6.3 | 6.7 | 7.5 | 3 | 5 | 7 |
| Ceresco | 6.0 | 5.5 | 5.5 | 4 | 2 | 8 |
| Rockito | 6.7 | 7.3 | 8.0 | 1 | 4 | 6 |
| SV8528ND | 6.7 | 7.0 | 6.0 | 3 | 4 | 3 |
| Manesco | 5.0 | 6.0 | 5.5 | 6 | 7 | 2 |
| Paradiso | 6.3 | 7.0 | 7.5 | 4 | 3 | 2 |
| Centro | 6.3 | 6.7 | 6.5 | 1 | 3 | 3 |
| SVND 0367 | 7.0 | 6.5 | 7.5 | 1 | 4 | 6 |
| Medaillon | 6.7 | 6.0 | 7.5 | 1 | 4 | 1 |
| Sanjato | 7.5 | 7.0 | 7.5 | 7 | 10 | 1 |
| Motion | 6.3 | 6.0 | 8.0 | 3 | 3 | 2 |
| Hyfive | 7.0 | 7.5 | 7.5 | 2 | 3 | 2 |
| Hyway | 6.5 | 7.5 | 8.0 | 2 | 4 | 3 |
| Hysky | 6.0 | 6.3 | 8.0 | 2 | 3 | 0 |
| SV1332ND | 7.3 | 6.7 | 7.0 | 2 | 2 | 2 |

| | | | | | | |
|--------------|------------|------------|------------|-----------|----------|----------|
| Chico | 6.7 | 6.3 | 8.0 | 5 | 3 | 4 |
| Santero | 6.3 | 7.0 | 7.5 | 5 | 3 | 4 |
| Means | 6.6 | 6.5 | 7.1 | 3 | 5 | 3 |
| REDS | | | | | | |
| Red Light | 4.7 | 5.0 | 3.5 | 13 | 12 | 8 |
| AF 219 | 6.0 | 5.5 | 7.5 | 17 | 8 | 1 |
| Red Planet | 6.0 | 6.0 | 6.5 | 10 | 10 | 2 |
| AF 111 | 6.5 | 6.5 | 6.0 | 10 | 6 | 7 |
| AF 222 | 6.5 | 4.5 | 5.5 | 9 | 5 | 8 |
| Retano | 5.3 | 4.7 | 6.5 | 10 | 6 | 2 |
| AF 175 | 7.5 | 4.5 | 6.5 | 7 | 7 | 2 |
| Red Tide | 6.3 | 6.3 | 5.0 | 7 | 16 | 7 |
| Redspark | 4.7 | 4.7 | 5.0 | 16 | 9 | 6 |
| Red Baron(A) | 5.0 | 4.3 | 5.0 | 11 | 9 | 10 |
| 37-110 | 5.0 | 5.7 | 5.0 | 16 | 14 | 7 |
| Red Baron(E) | 5.3 | 4.3 | 6.5 | 7 | 12 | 7 |
| ABS 212 F1 | 5.3 | 6.0 | 6.0 | 7 | 8 | 3 |
| Means | 5.7 | 5.2 | 5.7 | 11 | 9 | 5 |