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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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ONIONS

Headline

- New varieties add positively to the choices available to growers offering excellent storage potential; a broader range of red varieties; and mildew resistance.
- Herbicide choices need to be carefully evaluated – get as much “local” info as is available

Background

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 seed, to 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. Establish varieties are included to give comparison with newer varieties and to evaluate performance stability. Growers have the opportunity to inspect the trials at key stages.

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 trial field and storage data is essential for growers to make informed decisions when selecting varieties.

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. Early main crop varieties hold the majority of the acreage but mid-range and late maturing varieties still hold a proportion but in cool seasons are only likely to mature properly on fertile soils. A range of maturities can still play an important part in spreading the harvest window. Red Baron still commands a large but diminishing percentage of the red area with Red Tide and others gaining popularity.

Available herbicide active ingredients are constantly under threat. Alongside the work of SCEPTREplus, growers and agronomists, a herbicide trial series was conducted to look at the performance of programmes targeted at the early season applications.

Results overview – Trial records and data collected from onion variety trials

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.

Table A. NIAB Spring Sown Onion Trials drilled from seed 2020 – Varieties, Maturities, Yield & Storage (2019)

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 >40mm (t/ha)	Ambient Storage % sound bulbs at end May	Cold Storage % sound bulbs at end July
BROWNS					
Numbito	Agility/Seminis	31-Jul	66.9	80	90
Medusa	Takii	01-Aug	81.0	32	43
Hybing	Bejo/DGS	01-Aug	63.2	87	82
Shakito	Agility/Seminis	02-Aug	64.6	69	84
Hybound	Bejo/DGS	02-Aug	66.1	76	87
Nation (SG8360)	Syngenta	02-Aug	65.8	86	88
Bruce (TEON 813)	Takii	03-Aug	59.9	86	89
Vision	Syngenta	03-Aug	64.5	83	79
Packito (SV8528ND)	Agility/Seminis	03-Aug	66.8	81	76
Hypark	Bejo/DGS	04-Aug	66.7	82	73
SVDN0233	Agility/Bayer	04-Aug	65.9	75	82
Fasto (37-104)	Hazera	04-Aug	67.6	82	76
Centro	Hazera	05-Aug	64.4	79	72
Bennito	Agility/Bayer	06-Aug	61.7	68	71
Hytech	Bejo/DGS	07-Aug	64.6	84	84
Hyway	Bejo/DGS	07-Aug	65.8	95	92
Hyroad (BGS 337)	Bejo/DGS	07-Aug	61.4	94	87
Motion	Syngenta	08-Aug	66.0	84	80
Hysky (BGS 289)	Bejo/DGS	08-Aug	66.8	95	88
Promotion (SG8359)	Syngenta	09-Aug	67.9	89	85
Hylander	Bejo/DGS	11-Aug	62.2	85	88
Elista	ProVeg	27-Aug	50.2	71	74
Means		06-Aug	65.0	81	79
REDS					
37-219	Hazera	04-Aug	57.5		
Red Light	Bejo/DGS	05-Aug	76.1	31	83
Ruby Star (TEON 502)	Takii	05-Aug	62.3	96	48
37-222	Hazera	06-Aug	59.0	67	84
Red Herald	Allium Seeds	09-Aug	60.1	72	82
37-175	Hazera	11-Aug	59.4		
Redspark	Bejo/DGS	13-Aug	63.7		
Red Tide	Bejo/DGS	14-Aug	62.3	93	89
Red Ray	Bejo/DGS	16-Aug	64.5		
Redlander	Bejo/DGS	17-Aug	59.1		
Karminka	ProVeg	18-Aug	42.9	42	42
EX07714593	Agility/Bayer	22-Aug	62.3		
Red Baron	Bejo/DGS	22-Aug	64.2	85	87
Means		12-Aug	61.0	74	75
PINK					
Isobel Rose	ProVeg	22-Aug	43.3		

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 cold store.

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

- Raker Farms, Croxton, Norfolk – drilled onions on a Breckland soil (variety trial)
- P G Rix Farms, nr Colchester, Essex – drilled onions on a silty soil (variety trial and herbicide trial)
- G's Growers, nr Ely, Cambridgeshire – drilled onions on a fen soil (herbicide trial)

Production details

The trials were drilled on 11th March (Norfolk) and 23rd March (Essex) and were harvested on 26th August (Norfolk) and 3rd 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.

The herbicide trial plots were marked out in commercial crops – 8 treatments x 4 replicates.

Trial records and data collected

The 2020 season average maturities of brown onions were almost 3 weeks earlier than the 10 year averages and approximately two weeks earlier for the red onions. A wet autumn/winter 2019/2020 meant that growers were concerned about land preparation but in the end both trial were drilled around the “normal” time. The Essex trial was a little slow establishing but caught up in the mild spring conditions. The Norfolk trial established well from the offset. By the summer equinox the trials were on track for normal harvest maturity, with Norfolk at 56TL (true leaves) and Essex at 5-6TL.

Fusarium was not an obvious issue – in stark contrast to 2018 – and mildew wasn't a major issue as it only came in late in the season and was controlled by the commercial fungicide programme.

Both trials followed local commercial agronomy. Maleic hydrazide was not applied to either trial.

Key varieties are discussed below.

Varieties Discussion

There is a range of maturities allowing growers to spread their harvest period but over half the brown varieties were at the early end of the spectrum. A series of warmer years has seen the average maturity date shifting to earlier in the year. This will also have been affected by an increased number of earlier maturing varieties coming through into trials and thus shifting the split of early to main crop varieties.

The majority of varieties reached maturity as expected at the end of the summer and favourable conditions in August and early September allowed both trials to be harvested in a timely fashion.

However, in cooler years, such as 2013, we see the maturity dates shifting later in the year and the opportunities to harvest later maturing varieties can run over into October which can result in bulbs having poorer initiation, being harder to dry and consequently inferior storage. Hotter summers are more likely to see storage issues not from harvest conditions but rather increases in issues such as Fusarium and bacterial rots as seen in 2018.

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 – there were no significant levels of mildew in the 2020 trials so the mildew resistant varieties or those with a degree of tolerance did not have a chance to outperform the others. Plant breeders continue to attempt to breed mildew resistance into commercially viable new varieties. Getting the resistance genes into varieties that have high yields, good quality and good storage potential has proved a challenge with some success seen in brown varieties but very limited success in the reds. There are concerns that as it is just a single resistance gene that many of the breeders are using that there is a chance it may breakdown.

Establishment was good in Norfolk but initially weaker in the Essex trial. The growing season started with mild conditions but then the summer was warm and dry. Crops matured earlier than the 10 year averages.

Commercial crops were generally good with a high quality of material going into store. Yields were variable much of which will have been affected by how easily, or not, growers were able to prepare the soil after the wet autumn. Set crops traditionally planted in January and February, particularly faced challenging cultivation issues.

Medusa, Fasto and Shakito showed the best early vigour in the browns; Redspark, 37-219, 37-222, 37-175 and Red Herald all had good early vigour in the reds.

The best performing for mid-season vigour were Shakito, Packito, Hypark, Centro and Hyway in the browns and the red varieties: Red Light, Red Herald, Redspark and Red Tide.

Numbito was the earliest of the brown varieties. Other consistently early varieties are Medusa, Hybing and Hybound. Shakito and Nation were also in the earliest maturing group. Red Light, 37-219, 37-222 and Ruby Star were the earliest of the reds.

The mean of trial yields in Norfolk was 66t/ha browns and 55t/ha reds, the trial was not adversely affected by rots or other grading losses.

The Essex trial yield means were 65t/ha browns and 67t/ha reds. A slow start may have contributed to yields being lower than in previous 'normal' seasons.

Over the last 5 years the 10 year average of the mean marketable yield has been creeping up by approx. 1 t/ha as better varieties become available and agronomic practices change and improve.

The highest yielding brown varieties (>60mm bulbs) were Medusa, Motion and Fasto. Red Light, Red Ray and EX07714593 were the highest yielding red varieties.

Hybound, Hypark, SVND0233, Hyway, Hytech, Hysky and Hylander, Centro, Fasto and Hyroad were the best of the brown varieties for having high percentages of single centres. Redspark, 37-219 and Red Tide were the best of the reds for single centres.

Storage assessments in an ambient store were recorded in early-April and late-May 2020. Cold storage assessments were recorded in July 2020.

Storage potential continues to be a key factor for drilled crops. Fusarium and bacterial rots in the field were expressed through loss of yield at grading and immediately going into storage.

Hyroad, Hyway and Hysky all performed significantly above average in 2019/20.

Motion, Hyway, and Vision have consistently had above average percentages of sound bulbs at the late-May assessment.

Red Tide, Red Baron, Ruby Star and Retano performed well in the reds.

In cold storage the varieties Hyway, Numbito and Hyfive were the best brown varieties for storage.

Red Tide and Red Baron and 37-123 were the best performing of the red varieties.

Stored bulb quality from the 2019 trials was generally good throughout most of the brown varieties and the reds showed more softening. The 2020 trials have held up well regarding quality (but with some softening of the reds) and the assessments will be in April and May 2021.

2020 Additional onion trials and KE events

- Onion herbicide trials
- demonstration of the effective herbicides identified in SCEPTREplus in programmes
- IPM webinar hosted by AHDB

The SCEPTREplus project work is recognised as a good mechanism for identifying and verifying new active ingredients that could be of use to onion growers and the wider vegetable industry as a whole. However it is then down to the industry to incorporate the actives identified into commercial pesticide programmes. The sharing of this information may not disseminate to all growers and the robustness of the data could be strengthened by additional trialling. With this in mind AHDB and the BOPA R&D committee approved 2 herbicides trials for 2020.

Two replicated trials, in Essex and Cambridgeshire, looked at 8 different herbicide programmes.

The “commercial standard” at each site was based on advice from the local agronomist and the other programmes adjusted to be comparable to the standard.

There were three spray timings starting at pre-emergence. Population counts, weed counts and phytotoxicity were all recorded.

Table B. NIAB Cambridgeshire Herbicide Trial - treatment programmes 2020

Tr. no.	Treatment	Pre-em	Post-crook	1TL
1	1	2.0L Wing-P	0.75L Wing-P 0.2kg Lentagran WP	0.75L Wing-P 0.4kg Lentagran WP
2	2	2.0L Wing-P	0.75L Wing-P 0.15kg Basagran SG	0.75L Wing-P 0.3kg Basagran SG
3	3	2.0L Wing-P	0.75L Wing-P 0.1L Starane HL	0.75L Wing-P 0.2L Starane HL
4	4	2.0L Wing-P	0.1L Emerger 0.1L Starane HL	0.2L Emerger 0.15L Starane HL
5	5	2.0L Wing-P	2.0L Defy 1.0L Oblix	0.3L Emerger 0.15L Starane HL
6	6	2.0L Wing-P	1.0L Stomp Aqua 1.0L Oblix	1.0L Wing-P 1.0L Oblix
7	Control	Untreated	Untreated	Untreated
8	Commercial standard	2.0L Wing-P 1.8L Intruder	1.0L Stomp Aqua 2.0L Defy 1.8L Intruder	0.4L Buctril 0.15L Starane HL

Table C. NIAB Essex Herbicide Trial - treatment programmes 2020

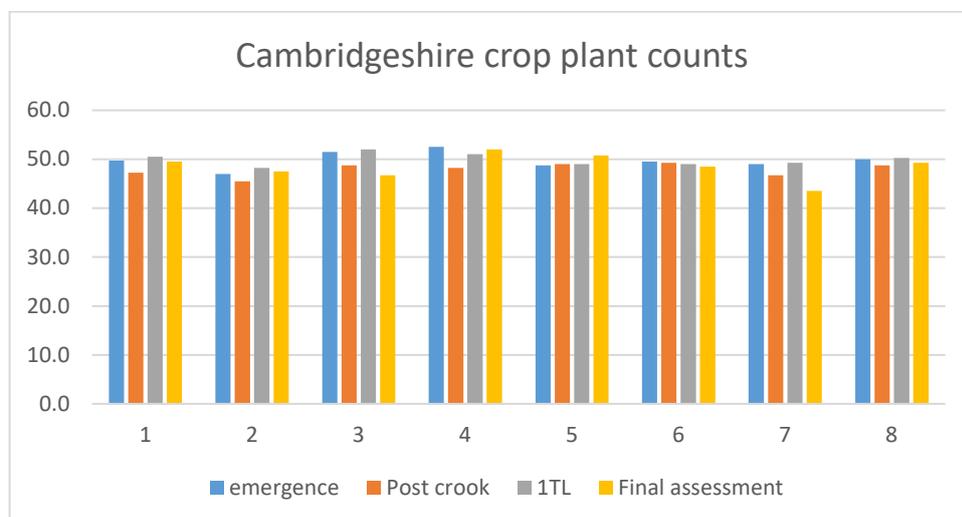
Tr. no.	Treatment	Pre-em	Post-crook	1TL
1	1	1.25L Wing-P 1L Stomp Aqua	0.5L Wing-P 0.2kg Lentagran WP	0.75L Wing-P 0.4kg Lentagran WP
2	2	1.25L Wing-P 1L Stomp Aqua	0.5L Wing-P 0.15kg Basagran SG	0.75L Wing-P 0.3kg Basagran SG
3	3	1.25L Wing-P 1L Stomp Aqua	0.5L Wing-P 0.1L Starane HL	0.5L Wing-P 0.2L Starane HL
4	4	1.25L Wing-P 1L Stomp Aqua	0.1L Emerger 0.1L Buctril	0.3L Emerger 0.2L Buctril
5	5	0.5L Emerger	0.1L Emerger 0.1L Buctril	0.3L Emerger 0.2L Buctril
6	6	0.5L Emerger 1L Stomp Aqua	0.5L Wing-P 0.1L Buctril	0.3L Emerger 0.2L Buctril
7	Control	Untreated	Untreated	Untreated
8	Commercial standard	1.25L Wing-P 1L Stomp Aqua	0.5L Wing-P 0.1L Buctril	0.75L Wing-P 0.15L Buctril

Onion Herbicide Trial Results

Table D. NIAB Cambridgeshire Herbicide Trial – plant counts, weed counts and phytotoxicity data 2020

Treatment	Emergence			Post crook			1 true leaf			Post-final treatment		
	Plants /m2	Weeds /m2	Phyto 9=none	Plants /m2	Weeds /m2	Phyto 9=none	Plants /m2	Weeds /m2	Phyto 9=none	Plants /m2	Weeds /m2	Phyto 9=none
1	49.8	16.3	9.0	47.3	28.5	9.0	50.5	18.3	8.0	49.5	21.8	8.0
2	47.0	19.8	9.0	45.5	31.0	9.0	48.3	12.5	7.3	47.5	11.0	8.5
3	51.5	19.3	9.0	48.8	35.3	9.0	52.0	28.0	8.0	46.8	28.8	9.0
4	52.5	17.0	9.0	48.3	28.5	9.0	51.0	10.3	8.3	52.0	16.8	8.8
5	48.8	21.0	9.0	49.0	31.8	9.0	49.0	9.3	8.0	50.8	15.0	8.5
6	49.5	17.5	9.0	49.3	33.8	9.0	49.0	18.8	9.0	48.5	22.3	7.8
7	49.0	22.3	9.0	46.8	46.8	9.0	49.3	65.0	9.0	43.5	41.8	9.0
8	50.0	14.3	9.0	48.8	27.3	9.0	50.3	6.8	7.3	49.3	9.5	7.5

Graph A. NIAB Cambridgeshire Herbicide Trial – graphs of plant counts, weed counts and phytotoxicity data 2020



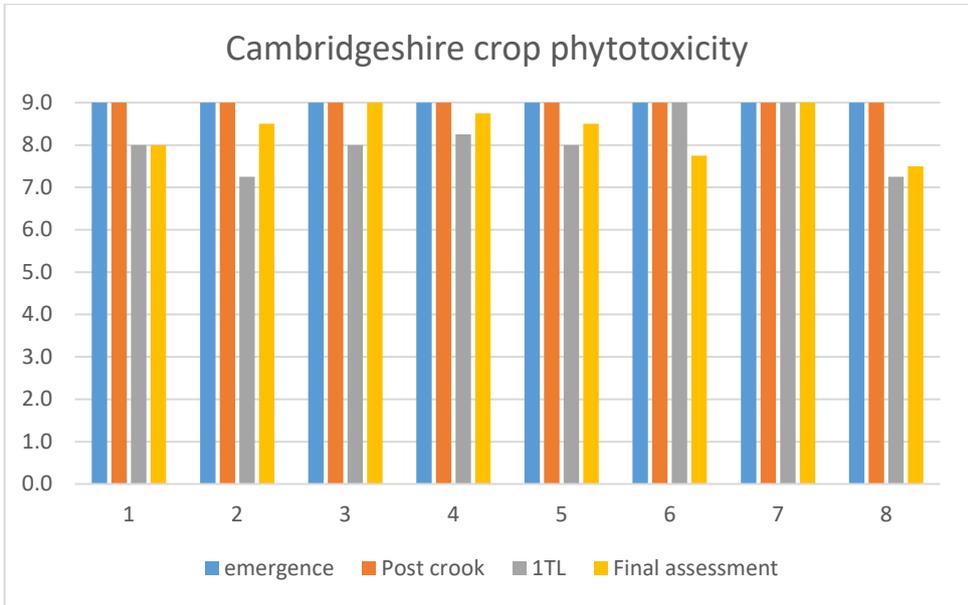
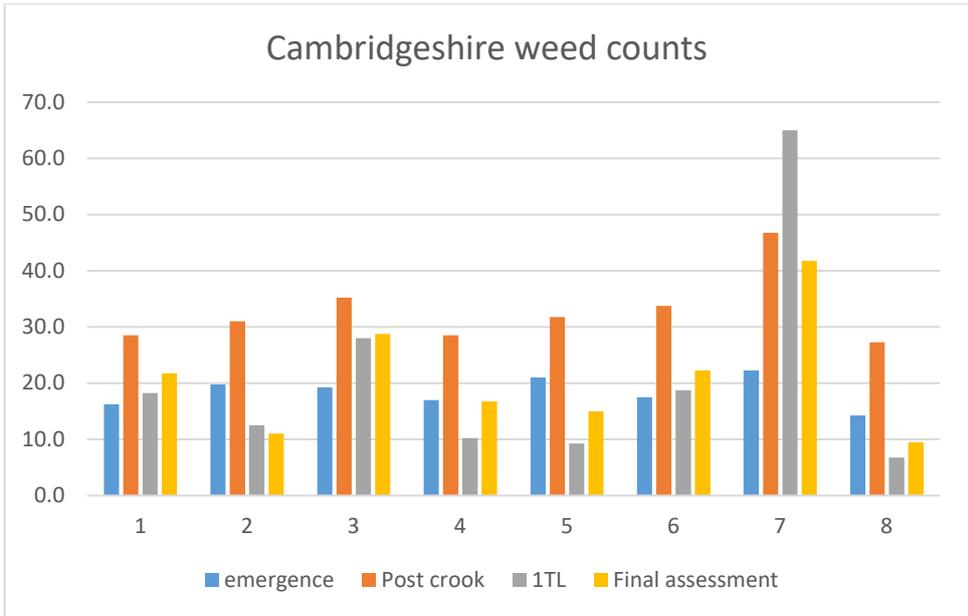
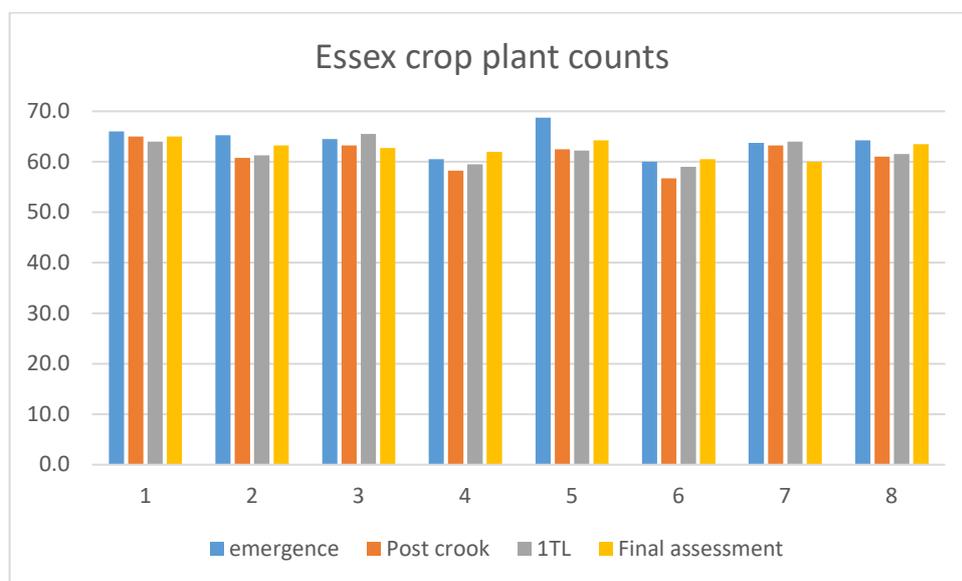
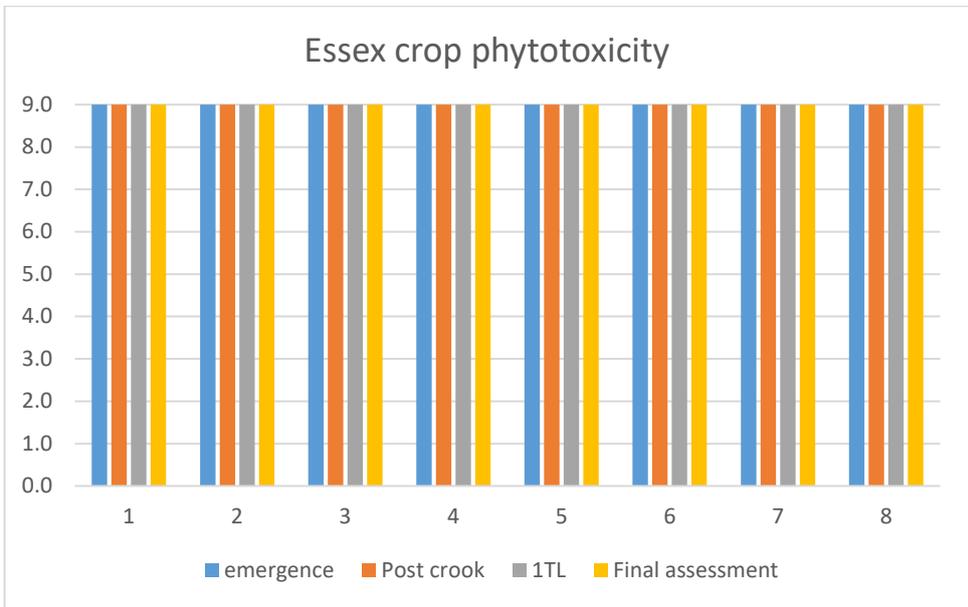
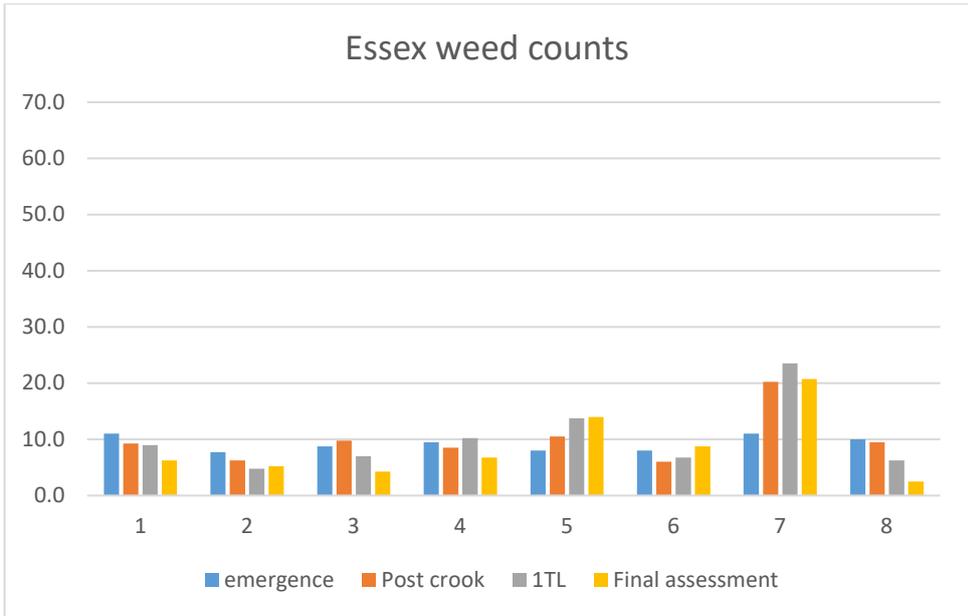


Table E. NIAB Essex Herbicide Trial - plant counts, weed counts and phytotoxicity data 2020

Treatment	Emergence			Post crook			1 true leaf			Post-final treatment		
	Plants /m2	Weeds /m2	Phyto 9=None	Plants /m2	Weeds /m2	Phyto 9=None	Plants /m2	Weeds /m2	Phyto 9=None	Plants /m2	Weeds /m2	Phyto 9=None
1	66.0	11.0	9.0	65.0	9.3	9.0	64.0	9.0	9.0	65.0	6.3	9.0
2	65.3	7.8	9.0	60.8	6.3	9.0	61.3	4.8	9.0	63.3	5.3	9.0
3	64.5	8.8	9.0	63.3	9.8	9.0	65.5	7.0	9.0	62.8	4.3	9.0
4	60.5	9.5	9.0	58.3	8.5	9.0	59.5	10.3	9.0	62.0	6.8	9.0
5	68.8	8.0	9.0	62.5	10.5	9.0	62.3	13.8	9.0	64.3	14.0	9.0
6	60.0	8.0	9.0	56.8	6.0	9.0	59.0	6.8	9.0	60.5	8.8	9.0
7	63.8	11.0	9.0	63.3	20.3	9.0	64.0	23.5	9.0	60.0	20.8	9.0
8	64.3	10.0	9.0	61.0	9.5	9.0	61.5	6.3	9.0	63.5	2.5	9.0

Graph B. NIAB Essex Herbicide Trial – graphs of plant counts, weed counts and phytotoxicity data 2020





Herbicide Trials Discussion

Weed pressure was higher on the Cambridgeshire site and this was compounded by a mild spring “encouraging” fresh flushes of weeds.

There was no significant loss of plants but there did seem to be a dip in the number of plants in the Cambridgeshire untreated plots which may have been due to competition from the weeds.

For the Cambridgeshire trial treatment 8 was the most effective of the treatments and treatment 2 kept on top of the weeds.

There were no major frost events and it is these conditions that often accentuate any phytotoxic effects. Treatment 2 appeared to have the most noticeable phytotoxic effect in the field but the data actually showed treatment 8 to be the “hottest” but treatment 2 also had some knockback effect on the crop.

The farm crop required another two herbicide applications to keep on top of the weed situation.

The Essex trial had lower weed pressure and treatment 2 was consistently good at keeping the weeds under control. Treatment 8 gave the longest lasting control.

Again there were no major frost events to cause any issues and no phytotoxicity was seen.

The farm crop received another herbicide application as routine to control any grass weeds and a final application to clean up any remaining weed hot spots.

The choice of active ingredients is somewhat limited and there are restrictions on the total rate that can be applied.

A robust pre-emergence spray is favoured as it is least likely to have a phytotoxic effect on the crop but then it is a challenge to apply active ingredients at sufficient rates to control the weeds but to balance this against potential phytotoxic effects.

As weeds will continue to come through a little and often approach is favoured but this might not always be sufficient to control the weeds.

These results are only from a single year on two specific sites so should be treated with great caution but are valuable in building a picture of suitability of active ingredients in an herbicide programme.

Similarly it is not easy to pick out the effects of individual chemistry without looking at the broader set of data. Growers should review these with a BASIS qualified agronomist.

Conclusions

The yield potential of varieties can vary greatly. In the drilled trials this was approx. 31 t/ha (27 t/ha and 27 t/ha in 2019 and 2018 respectively) between the highest and lowest yield means for brown varieties – although there was an exceptionally high and a weak performer then other varieties had an 8 t/ha spread.

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

Varieties 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.

Varieties

Varieties need to match the grower's requirements and ideally have two or more above average characteristics e.g. for early maturity and high green plot yields, Medusa, is a suitable choice; for green plot yield and post storage yields Hyway, Hysky, Nation and Promotion performed well; Numbito performed well for early vigour and green plot yield. Fasto, Bruce and Numbito remain varieties to keep an eye on over the next couple of seasons. Nation is one of the newest varieties looking like a reliable choice but will need a couple more years of data to confirm this.

In the drilled trials there was approx. 30 t/ha between the highest and lowest yields (reds and browns, mean of both trials - including non-standard varieties).

Drilled material (2019 trials) showed a difference of over 60%, between the best and worst storage potential from ambient store and of approx. 45% from cold storage.

Medusa, Hybound, Numbito, and Hybing are consistently early maturing brown varieties. Nation was the earliest of the new brown varieties.

Red Light is commonly one of the earliest reds; Ruby Star is also early maturing. 37-219 and 37-222 are also at the early end of the spectrum.

The highest yielding brown varieties (>60mm bulbs) were Medusa, Motion and Fasto.

Red Light, Red Ray and EX07714593 were the highest yielding red varieties.

Medusa, Motion, Hypark, Hytech and Hybound have consistently been amongst the higher yielders.

Hybound, SVND0233, Fasto, Centro, Hyway, Hytech, Hysky, Hylander and Hyroad were the best of the brown varieties for having high percentages of single centres. 37-219, Redspark and Red Tide were the best of the reds for single centres.

Hyway, Hyroad and Hysky all performed significantly above average in ambient storage in 2019/20.

Fasto, Hyfive, Vision, Bruce, Motion and the new variety Nation also performed well either in this season or consistently over a number of seasons.

Ruby Star, Red Tide, Red Baron and Retano performed well in the reds.

In cold storage the varieties Numbito, Hyway and Hyfive were the best brown varieties for storage.

Red Tide Red Baron and 37-123 were the best performing of the red varieties. Red Light has performed well previously.

Herbicides

Tailor your herbicide programme to known weed pressures and climate risks. Consult a BASIS registered agronomist.

The trials data is only a single year's worth of data in a season that was not very challenging from a weather point of view. Compare the data with other available sources.

Financial Benefits

The yield potential of varieties can vary greatly. In the drilled trials this was approx. 31 t/ha and 33 t/ha between the highest and lowest yielding browns and reds respectively (mean of both trials).

Yield out of store is also important. Drilled material showed a difference of over 60% and 65% between the best and worst storage potential from ambient storage in the browns and reds respectively. From cold storage the differences were approx. 45% 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.
- Varieties should match the market and available storage facilities – longer storing varieties give more options.
- In high disease pressure years growers material with good disease resistance e.g. mildew resistance – grow a range of varieties and use local knowledge of fields that could be disease hot spots.
- Seed cost (variety and seed treatment) is a factor in the selection of varieties
- Tailor herbicide programmes to be adaptive to the season and weed pressures

Technology transfer

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

Open days and events were planned for these occasions:

1. Drilled crop field open day in Essex – August 2020 – cancelled due to covid-19 restrictions
2. Drilled crops harvested produce open day and technical presentations at NIAB, Cambridge – November 2020 – virtual event

The virtual events were well attended by a number of growers, seed trade, agronomists, research providers, etc.

The August event was replaced by an interview with the farming press from The Vegetable Farmer and published in the October issue. The November event will be reported in the January 2021 issue.

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.

Onion Appendices

Table 1. NIAB Spring Sown Onion Trials from seed 2020 – 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					
Numbito	R	Agility/Seminis	03-Aug	29-Jul	31-Jul
Medusa	2	Takii	04-Aug	29-Jul	01-Aug
Hybing	C	Bejo/DGS	02-Aug	01-Aug	01-Aug
Shakito	4	Agility/Seminis	03-Aug	01-Aug	02-Aug
Hybound	R	Bejo/DGS	05-Aug	31-Jul	02-Aug
Nation (SG8360)	1	Syngenta	04-Aug	01-Aug	02-Aug
Bruce (TEON 813)	3	Takii	04-Aug	02-Aug	03-Aug
Vision	C	Syngenta	03-Aug	03-Aug	03-Aug
Packito (SV8528ND)	R	Agility/Seminis	04-Aug	03-Aug	03-Aug
Hypark	R	Bejo/DGS	04-Aug	03-Aug	04-Aug
SVDN0233	1	Agility/Bayer	07-Aug	01-Aug	04-Aug
Fasto (37-104)	4	Hazera	06-Aug	02-Aug	04-Aug
Centro	C	Hazera	08-Aug	02-Aug	05-Aug
Bennito	R	Agility/Bayer	06-Aug	07-Aug	06-Aug
Hytech	C	Bejo/DGS	06-Aug	07-Aug	07-Aug
Hyway	R	Bejo/DGS	08-Aug	05-Aug	07-Aug
Hyroad (BGS 337)	2	Bejo/DGS	09-Aug	06-Aug	07-Aug
Motion	R	Syngenta	09-Aug	07-Aug	08-Aug
Hysky (BGS 289)	R	Bejo/DGS	09-Aug	08-Aug	08-Aug
Promotion (SG8359)	1	Syngenta	10-Aug	08-Aug	09-Aug
Hylander	R	Bejo/DGS	14-Aug	08-Aug	11-Aug
Elista	3	ProVeg	29-Aug	25-Aug	27-Aug
Means			07-Aug	04-Aug	06-Aug
REDS					
37-219	1	Hazera	08-Aug	31-Jul	04-Aug
Red Light	R	Bejo/DGS	08-Aug	02-Aug	05-Aug
Ruby Star (TEON 502)	2	Takii	08-Aug	02-Aug	05-Aug
37-222	4	Hazera	07-Aug	05-Aug	06-Aug
Red Herald	R	Allium Seeds	11-Aug	07-Aug	09-Aug
37-175		Hazera	15-Aug	08-Aug	11-Aug
Redspark	R	Bejo/DGS	21-Aug	06-Aug	13-Aug
Red Tide	C	Bejo/DGS	22-Aug	06-Aug	14-Aug
Red Ray	P	Bejo/DGS	22-Aug	09-Aug	16-Aug
Redlander	P	Bejo/DGS	25-Aug	10-Aug	17-Aug
Karminka	3	ProVeg	11-Aug	25-Aug	18-Aug
EX07714593	1	Agility/Bayer	27-Aug	18-Aug	22-Aug
Red Baron	C	Bejo/DGS	31-Aug	14-Aug	22-Aug
Means			16-Aug	08-Aug	12-Aug
PINK					
Isobel Rose	P	ProVeg	22-Aug	22-Aug	22-Aug

Table 2. NIAB Spring Sown Onion Trials from seed 2020 - 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 >40mm bulbs (t/ha)			marketable yield >60mm bulbs (t/ha)			% bulbs by weight >60mm		
	Rix	Raker	Mean	Rix	Raker	Mean	Rix	Raker	Mean	Rix	Raker	Mean
BROWNS												
Numbito	54.4	50.8	52.6	65.6	68.2	66.9	41.8	50.5	46.2	62.8	74.1	68.4
Medusa	49.5	51.3	50.4	78.6	83.5	81.0	66.0	73.1	69.6	82.9	87.6	85.3
Hybing	49.6	46.3	48.0	60.7	65.7	63.2	36.4	51.0	43.7	60.0	77.5	68.7
Shakito	57.1	52.2	54.7	65.2	64.1	64.6	37.3	41.1	39.2	57.0	63.8	60.4
Hybound	52.5	50.0	51.3	64.4	67.8	66.1	44.2	50.1	47.1	66.6	73.8	70.2
Nation	59.2	52.4	55.8	65.8	65.8	65.8	38.0	45.8	41.9	57.7	69.5	63.6
Bruce	51.3	45.5	48.4	59.0	60.9	59.9	37.2	46.1	41.7	62.3	75.7	69.0
Vision	53.8	45.5	49.6	66.0	63.0	64.5	43.3	49.9	46.6	65.2	79.3	72.3
Packito	56.9	52.4	54.7	65.1	68.5	66.8	36.4	48.6	42.5	55.8	70.9	63.4
Hypark	55.9	52.9	54.4	66.3	67.1	66.7	41.6	46.5	44.0	61.2	69.1	65.2
SVDN0233	53.9	50.4	52.2	68.6	63.1	65.9	46.7	41.9	44.3	66.8	66.0	66.4
Fasto	52.5	51.3	51.9	65.8	69.4	67.6	46.0	51.6	48.8	69.2	74.2	71.7
Centro	53.7	51.0	52.3	62.0	66.8	64.4	37.3	46.8	42.0	58.1	69.5	63.8
Bennito	52.6	50.4	51.5	62.8	60.5	61.7	41.0	41.2	41.1	65.1	68.0	66.6
Hytech	53.5	49.6	51.5	65.6	63.6	64.6	43.7	46.1	44.9	66.1	72.4	69.3
Hyway	55.4	51.2	53.3	66.4	65.3	65.8	42.2	44.9	43.6	62.8	68.9	65.8
Hyroad	52.5	45.0	48.8	62.2	60.7	61.4	39.7	44.6	42.1	62.4	73.5	67.9
Motion	45.9	50.8	48.3	63.0	69.0	66.0	49.3	50.1	49.7	78.3	72.5	75.4
Hysky	54.3	50.5	52.4	66.3	67.4	66.8	42.2	49.8	46.0	63.0	73.9	68.5
Promotion	55.0	47.9	51.4	66.3	69.6	67.9	40.7	54.3	47.5	60.8	78.2	69.5
Hylander	51.2	50.2	50.7	61.0	63.4	62.2	38.6	43.1	40.9	62.5	68.0	65.3
Elista	46.5	39.5	43.0	53.5	46.9	50.2	33.3	27.0	30.2	62.1	57.2	59.7
Means	53.1	49.4	51.2	64.5	65.5	65.0	42.0	47.5	44.7	64.0	72.0	68.0
REDS												
37-219	42.3	45.3	43.8	60.9	54.1	57.5	49.4	32.5	41.0	81.1	59.8	70.4
<i>Red Light</i>	49.1	52.2	50.7	79.0	73.2	76.1	70.7	55.2	63.0	89.5	75.5	82.5
Ruby Star	49.9	45.8	47.9	68.4	56.3	62.3	52.6	36.4	44.5	76.1	64.9	70.5
37-222	43.1	42.4	42.8	65.5	52.5	59.0	53.9	33.2	43.6	82.2	63.1	72.7
Red Herald	50.1	44.9	47.5	64.9	55.3	60.1	42.3	36.4	39.4	64.8	65.8	65.3
37-175	44.6	42.2	43.4	65.0	53.7	59.4	53.0	37.6	45.3	81.4	69.5	75.5
Redspark	47.1	45.0	46.0	70.0	57.5	63.7	59.2	40.9	50.0	84.2	70.9	77.6
Red Tide	45.6	45.6	45.6	67.2	57.4	62.3	55.1	38.7	46.9	81.8	67.3	74.5
Red Ray	44.6	39.3	42.0	73.5	55.5	64.5	64.6	44.3	54.4	87.4	79.6	83.5
<i>Redlander</i>	40.0	38.3	39.2	66.6	51.5	59.1	58.6	39.5	49.1	87.8	76.6	82.2
Karminka	50.7	22.1	36.4	54.6	31.2	42.9	31.6	22.6	27.1	57.9	71.7	64.8
EX07714593	43.2	38.3	40.7	68.5	56.1	62.3	59.9	46.0	52.9	87.5	81.9	84.7
Red Baron	50.8	44.9	47.8	69.9	58.5	64.2	56.9	43.7	50.3	81.3	74.8	78.0
Means	46.2	42.0	44.1	67.2	54.8	61.0	54.4	39.0	46.7	80.2	70.9	75.6
PINK												
<i>Isobel Rose</i>	27.4	18.3	22.8	51.2	35.3	43.3	47.1	32.8	39.9	92.0	92.9	92.5

Table 3. NIAB Spring Sown Onion Trials from seed 2020 - rots by category

Sites: Rix (Essex) and Raker (Norfolk)

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

Variety	Population & Yield						% bacterial rots								
	% Base Rots			% Neck Rots			% bacterial rots			% Penicillium			% other defects		
	Rix	Raker	Mean	Rix	Rak.	Mean	Rix	Rak.	Mean	Rix	Rak.	Mean	Rix	Rak.	Mean
BROWNS															
Numbito	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6	0.4
Medusa	0.0	0.9	0.4	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.1	2.1	1.5	1.8
Hybing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2
Shakito	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.3	0.9
Hybound	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.2	0.6
Nation	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.4	0.9
Bruce	0.0	0.2	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.7	0.5	0.6
Vision	0.0	0.3	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.0	0.7
Packito	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.3
Hypark	0.2	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.1	0.8
SVDN0233	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.1	0.6
Fasto	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.6	0.3	0.5
Centro	0.0	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.1
Bennito	0.0	0.7	0.4	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.8	1.4	1.6
Hytech	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7	0.5
Hyway	0.0	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.2	0.1	0.2
Hyroad	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.0	0.8
Motion	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.3	0.2
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	0.0	0.3	0.1
Promotion	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.5	0.7
Hylander	0.0	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.3	0.3
Elista	0.0	0.2	0.1	0.0	0.2	0.1	0.3	0.0	0.1	0.0	0.0	0.0	1.8	0.4	1.1
Means	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.6
REDS															
37-219	1.9	0.3	1.1	0.0	0.0	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.5	0.3	0.4
Red Light	0.0	0.0	0.0	0.2	0.0	0.1	0.0	0.2	0.1	0.0	0.0	0.0	1.0	0.0	0.5
Ruby Star	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6	0.4
37-222	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.2	0.5	0.3	0.4
Red Herald	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.7	0.6
37-175	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1
Redspark	1.2	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.2	0.4
Red Tide	1.2	0.0	0.6	0.0	0.0	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.6	0.3	0.5
Red Ray	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.3
Redlander	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1
Karminka	0.1	0.0	0.1	0.0	2.1	1.1	0.1	1.3	0.7	0.0	0.0	0.0	0.4	0.4	0.4
EX07714593	0.2	0.6	0.4	0.0	0.2	0.1	0.4	0.0	0.2	0.0	0.0	0.0	3.0	0.4	1.7
Red Baron	0.4	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.3	0.5
Means	0.4	0.1	0.3	0.0	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.6	0.3	0.5
PINK															
Isobel Rose	0.0	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	1.6	1.9

Table 4. NIAB Spring Onion Trials from seed 2020 – Bulb Quality data

Sites: Rix (Essex) and Raker (Norfolk)

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

Variety	Bulb Quality (1-9)														
	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															
Numbito	5.0	5.0	5.0	7.0	7.0	7.0	5.5	5.5	5.5	6.5	6.0	6.3	8.0	7.0	7.5
Medusa	6.0	6.0	6.0	7.0	6.5	6.8	5.5	5.5	5.5	6.5	6.5	6.5	7.0	8.0	7.5
Hybing	5.0	5.0	5.0	7.0	6.5	6.8	5.5	5.5	5.5	6.5	6.0	6.3	7.0	7.0	7.0
Shakito	5.0	5.0	5.0	7.0	6.5	6.8	5.5	5.0	5.3	6.5	7.0	6.8	8.0	8.0	8.0
Hybound	5.0	5.0	5.0	7.0	7.0	7.0	4.5	4.5	4.5	6.5	6.0	6.3	7.0	8.0	7.5
Nation	5.0	5.5	5.3	7.0	6.5	6.8	5.5	5.5	5.5	6.5	6.5	6.5	8.0	8.0	8.0
Bruce	5.0	5.0	5.0	8.0	7.5	7.8	4.5	5.0	4.8	7.0	6.5	6.8	7.0	7.0	7.0
Vision	5.0	5.0	5.0	7.0	7.0	7.0	5.0	5.5	5.3	7.0	6.5	6.8	7.0	8.0	7.5
Packito	5.0	5.0	5.0	7.0	7.0	7.0	5.5	5.5	5.5	6.5	6.5	6.5	8.0	8.0	8.0
Hypark	5.0	5.0	5.0	7.0	6.5	6.8	5.5	5.5	5.5	6.5	6.0	6.3	8.0	8.0	8.0
SVDN0233	5.0	5.0	5.0	7.0	7.0	7.0	5.0	5.5	5.3	7.5	6.5	7.0	7.0	7.5	7.3
Fasto	5.0	5.0	5.0	7.0	7.0	7.0	5.5	5.0	5.3	7.0	7.0	7.0	7.0	8.0	7.5
Centro	5.0	5.0	5.0	7.0	7.0	7.0	5.0	5.0	5.0	6.0	6.5	6.3	8.0	7.0	7.5
Bennito	5.0	4.5	4.8	7.0	7.0	7.0	4.5	4.5	4.5	6.5	6.5	6.5	7.0	8.0	7.5
Hytech	5.0	5.0	5.0	7.0	7.0	7.0	5.5	4.5	5.0	7.0	7.0	7.0	7.0	8.0	7.5
Hyway	4.0	5.0	4.5	7.0	7.0	7.0	5.0	5.5	5.3	6.5	6.0	6.3	7.0	7.0	7.0
Hyroad	5.0	5.0	5.0	7.0	7.0	7.0	4.5	4.5	4.5	6.0	6.5	6.3	7.0	8.0	7.5
Motion	5.0	5.0	5.0	7.0	7.0	7.0	5.5	5.0	5.3	6.5	6.5	6.5	7.0	7.0	7.0
Hysky	5.0	5.0	5.0	7.0	6.5	6.8	5.0	5.5	5.3	7.0	5.5	6.3	8.0	8.0	8.0
Promotion	5.0	5.0	5.0	7.0	7.0	7.0	5.0	5.5	5.3	6.0	6.0	6.0	7.0	7.0	7.0
Hylander	5.0	4.5	4.8	7.0	7.0	7.0	4.5	4.5	4.5	6.5	6.5	6.5	7.0	8.0	7.5
Elista	4.5	5.0	4.8	7.0	6.5	7.0	8.0	7.5	7.8	7.0	6.0	6.5	6.0	7.0	6.5
Means	5.0	5.0	5.0	7.0	6.9	7.0	5.3	5.3	5.3	6.6	6.4	6.5	7.3	7.6	7.4
REDS															
37-219	5.0	5.0	5.0	6.0	7.0	6.5	4.5	4.5	4.5	6.5	6.0	6.3	7.0	7.0	7.0
Red Light	7.0	7.5	7.3	5.5	7.0	6.3	5.0	4.5	4.8	5.0	6.0	5.5	5.5	6.5	6.0
Ruby Star	6.0	6.0	6.0	7.0	7.0	7.0	4.5	4.5	4.5	7.0	7.0	7.0	7.0	7.0	7.0
37-222	5.0	5.0	5.0	6.0	7.0	6.5	4.5	4.5	4.5	6.0	6.5	6.3	7.0	7.0	7.0
Red Herald	6.0	5.0	5.5	6.5	6.0	6.3	5.0	4.5	4.8	6.5	6.0	6.3	7.0	7.0	7.0
37-175	6.0	5.0	5.5	6.0	6.0	6.0	4.5	4.0	4.3	5.0	6.5	5.8	6.5	7.0	6.8
Redspark	7.0	5.0	6.0	6.5	7.0	6.8	5.0	4.5	4.8	5.0	6.0	5.5	7.0	7.0	7.0
Red Tide	7.0	8.0	7.5	7.0	7.0	7.0	5.5	4.5	5.0	6.5	6.0	6.3	7.0	7.0	7.0
Red Ray	8.0	5.0	6.5	6.0	7.0	6.5	5.0	4.5	4.8	6.5	6.0	6.3	6.0	6.5	6.3
Redlander	7.0	5.0	6.0	7.0	7.0	7.0	5.0	5.0	5.0	7.0	7.0	7.0	7.0	7.0	7.0
Karminka	5.5	6.0	5.8	6.5	6.0	6.3	9.0	8.0	8.5	7.0	7.0	7.0	6.0	7.0	6.5
EX07714593	5.0	5.0	5.0	6.0	6.0	6.0	7.0	7.0	7.0	6.0	7.0	6.5	6.0	6.5	6.3
Red Baron	7.0	7.0	7.0	6.5	6.5	6.5	5.0	5.0	5.0	4.0	5.0	4.5	6.0	6.5	6.3
Means	6.3	5.7	6.0	6.3	6.7	6.5	5.3	5.0	5.2	6.0	6.3	6.2	6.5	6.8	6.7
PINK															
Isobel Rose	4.0	6.0	5.0	6.0	7.0	6.5	4.5	4.0	4.3	5.0	7.0	6.0	7.0	7.0	7.0

Table 5. NIAB Spring Sown Trials from seed 2020 – vigour and plant characteristics

Sites: Rix (Essex) and Raker (Norfolk)

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

variety	Establishment %			Early vigour 1-9 9=vigorous			Mid-June vigour/density 1-9 9=vigorous/dense		
	Rix	Raker	Mean	Rix	Raker	Mean	Rix	Raker	Mean
BROWNS									
Numbito	95	95	95	7.0	6.0	6.5	6.7	7.0	6.8
Medusa	87	95	91	7.7	7.3	7.5	6.0	6.3	6.2
Hybing	85	95	90	6.3	6.7	6.5	6.7	7.7	7.2
Shakito	90	95	93	7.3	7.0	7.2	7.7	7.7	7.7
Hybound	93	95	94	6.7	6.3	6.5	7.0	7.3	7.2
Nation	90	95	93	7.0	7.0	7.0	7.0	7.3	7.2
Bruce	90	90	90	6.7	6.0	6.3	6.7	6.3	6.5
Vision	95	95	95	7.3	6.7	7.0	7.0	7.0	7.0
Packito	90	95	93	7.0	7.0	7.0	7.3	7.3	7.3
Hypark	90	95	93	6.7	7.3	7.0	7.3	7.3	7.3
SVDN0233	90	95	93	7.0	7.0	7.0	7.0	7.0	7.0
Fasto	90	95	93	7.7	6.7	7.2	7.0	7.3	7.2
Centro	87	95	91	7.3	6.7	7.0	7.3	7.7	7.5
Bennito	95	95	95	7.3	6.7	7.0	6.7	6.7	6.7
Hytech	95	95	95	6.7	6.7	6.7	7.3	6.7	7.0
Hyway	95	95	95	6.7	7.3	7.0	8.0	7.0	7.5
Hyroad	95	90	93	6.7	7.0	6.8	7.7	6.7	7.2
Motion	93	95	94	7.0	7.0	7.0	7.3	7.3	7.3
Hysky	90	95	93	6.3	7.0	6.7	7.0	7.0	7.0
Promotion	90	95	93	6.7	7.3	7.0	7.0	7.3	7.2
Hylander	95	95	95	6.3	6.7	6.5	6.7	7.3	7.0
Elista	90	88	89	7.7	6.0	6.8	6.0	5.0	5.5
Means	91	94	93	7.0	6.8	6.9	7.0	7.0	7.0
REDS									
37-219	90	93	92	7.3	7.0	7.2	6.7	7.0	6.8
Red Light	95	95	95	7.0	7.0	7.0	8.0	7.0	7.5
Ruby Star	90	90	90	6.3	6.0	6.2	7.0	7.0	7.0
37-222	87	95	91	7.0	7.3	7.2	6.7	6.3	6.5
Red Herald	90	93	92	7.0	7.3	7.2	8.3	7.3	7.8
37-175	90	85	88	6.7	7.0	6.8	7.3	6.3	6.8
Redspark	95	95	95	7.7	7.3	7.5	7.7	7.0	7.3
Red Tide	90	88	89	7.0	7.0	7.0	7.0	7.7	7.3
<i>Red Ray</i>	85	95	90	6.3	7.0	6.7	6.3	6.7	6.5
<i>Redlander</i>	80	88	84	6.0	6.0	6.0	7.0	6.0	6.5
Karminka	87	93	90	6.0	6.3	6.2	5.0	4.0	4.5
EX07714593	85	87	86	6.7	7.0	6.8	5.3	5.3	5.3
Red Baron	90	95	93	7.0	7.0	7.0	7.0	7.3	7.2
Means	89	92	90	6.8	6.9	6.8	6.9	6.5	6.7
PINK									
<i>Isobel Rose</i>	95	20	30	4.0	5.0	4.5	4.0	4.0	4.0

Table 6. NIAB Spring Sown Onion Trials from seed 2020 - Onion Ring Data

Sites: Rix (Essex) and Raker (Norfolk)

Varieties in maturity order (mean of both sites)

Preliminary varieties 2 replicates of data

Variety	% Bulbs with single centres		
	Essex	Norfolk	Mean
BROWNS			
Numbito	96	67	81
Medusa	47	29	38
Hybing	80	74	77
Shakito	78	62	70
Hybound	82	84	83
Nation	62	50	56
Bruce	38	47	42
Vision	60	62	61
Packito	67	67	67
Hypark	69	87	78
SVDN0233	84	87	86
Fasto	93	82	88
Centro	91	91	91
Bennito	51	53	52
Hytech	82	89	86
Hyway	87	93	90
Hyroad	91	84	88
Motion	69	89	79
Hysky	89	82	86
Promotion	64	60	62
Hylander	80	84	82
Elista	40	44	42
Means	73	71	72
REDS			
37-219	71	91	81
<i>Red Light</i>	50	63	57
Ruby Star	44	71	58
37-222	60	87	74
Red Herald	47	44	46
37-175	71	76	73
Redspark	89	83	86
Red Tide	76	89	82
Red Ray	44	64	54
<i>Redlander</i>	70	63	67
Karminka	73	67	70
EX07714593	87	67	77
Red Baron	67	58	62
Means	65	71	68
PINK			
<i>Isobel Rose</i>	83	-	-

Table 7. NIAB Spring Sown Onion Trials from seed 2019 – Storage data (Ambient at Rix and Raker) Assessments Apr/May 2020 (cold storage June 2020)

Sites: Rix (Essex) and Raker (Norfolk) and additional cold storage samples (Cold store)

Varieties in maturity order (mean of both sites)

Preliminary varieties 2 replicates of data

Variety	% sound Early April			% sound Late May			% sound cold storage late June
	Rix	Raker	Mean	Rix	Raker	Mean	Rix
BROWNS							
Medusa	85	42	64	48	15	32	43
Numbito	96	98	97	81	79	80	90
SVDN0110	93	94	93	69	75	72	69
Hybing	95	98	97	88	86	87	82
Hybound	96	99	97	89	63	76	87
Hypark	93	98	95	84	79	82	73
SVDN0233	97	97	97	78	73	75	82
SG 8360	97	97	97	82	89	86	88
Vision	94	98	96	82	85	83	79
Shakito	92	96	94	71	67	69	84
Medaillon	96	96	96	81	75	78	43
Centro	96	98	97	76	83	79	72
Packito	95	97	96	81	80	81	76
Hyway	99	100	99	97	93	95	92
Bruce	93	96	95	86	87	86	89
Bennito	96	96	96	70	66	68	71
Hybound (n-p)	97	100	98	88	96	92	87
Hytech	94	91	93	85	84	84	84
Hyroad	99	99	99	91	97	94	87
Fasto	96	96	96	87	77	82	76
Hysky	98	98	98	95	96	95	88
Motion	90	98	94	79	88	84	80
Hyfive	97	100	98	89	89	89	91
Hylander	97	98	97	83	87	85	88
SG 8359	95	95	95	88	90	89	85
Santero	97	98	97	86	82	84	70
Elista	76	96	86	57	85	71	74
Means	94	95	95	81	80	81	79
REDS							
Red Light	80	51	66	40	23	31	83
Ruby Star	97	100	98	95	97	96	48
Red Tide	93	98	95	91	96	93	89
37-111	93	96	95	84	78	81	67
37-222	77	97	87	65	69	67	84
Red Herald	93	92	92	75	69	72	82
Red Baron	94	99	97	84	86	85	87
37-123	91		91	79		79	86
Retano	95	100	98	84	95	90	83
Karminka	67	81	74	34	50	42	42
Means	88	90	89	73	74	74	75

Table 8. NIAB Spring Sown Onion Trials from seed 2019 – Storage data (Ambient at Rix and Raker) Assessments May 2020 (cold storage June 2020)

Sites: Rix (Essex) and Raker (Norfolk) and additional cold storage samples (Cold store)

Varieties in maturity order (mean of both sites)

Preliminary varieties 2 replicates of data

Variety	firmness (1-9) 1=soft early April (ambient)			Total % rots Late May (ambient)		
	Rix	Raker	Cold store	Rix	Raker	Cold store
BROWNS						
Medusa	5.3	5.5	6.0	3	7	2
Numbito	6.8	7.7	7.0	3	2	2
<i>SVDN0110</i>	7.0	7.0	7.0	6	1	8
Hybing	7.3	7.7	8.0	6	1	7
Hybound	7.0	7.7	7.5	4	2	4
Hypark	6.7	7.7	6.5	7	1	6
<i>SVDN0233</i>	7.0	7.5	6.5	3	0	1
<i>SG 8360</i>	6.3	7.0	7.0	4	3	7
Vision	7.2	7.3	7.5	9	3	12
Shakito	6.7	7.5	7.5	5	1	3
Medaillon	7.0	7.3	7.0	4	3	6
Centro	7.0	6.8	7.0	4	1	6
Packito	7.0	7.7	7.0	6	2	7
Hyway	7.7	7.3	7.0	1	1	2
Bruce	6.5	6.8	7.5	9	5	8
Bennito	7.0	7.0	7.0	3	1	2
Hybound (n-p)	7.2	7.8	7.0	5	2	5
Hytech	7.3	7.5	7.0	6	10	4
Hyroad	7.3	7.7	7.0	2	1	5
Fasto	7.3	7.0	7.0	3	2	5
Hysky	7.0	7.0	7.5	2	2	10
Motion	6.8	8.0	8.0	6	3	2
Hyfive	7.0	7.7	7.0	2	0	5
Hylander	6.8	7.7	7.0	3	1	4
<i>SG 8359</i>	7.8	7.3	7.5	6	6	5
Santero	7.2	7.7	7.0	4	2	8
Elista	5.0	6.0	6.0	23	4	15
Means	6.9	7.3	7.1	5	2	6
REDS						
Red Light	4.7	7.0	6.0	5	11	5
Ruby Star	7.3	7.7	6.0	4	2	5
Red Tide	6.7	7.7	6.5	8	3	11
37-111	6.7	6.7	6.0	4	7	12
37-222	5.3	7.3	6.5	6	7	4
Red Herald	6.3	7.3	6.5	6	9	10
Red Baron	6.0	7.0	6.5	7	6	4
37-123	5.0		6.5	9		6
Retano	5.3	7.3	7.0	5	3	7
Karminka	5.0	5.7	5.0	12	31	14
Means	5.8	7.1	6.3	7	9	8