THE MORLEY FARM

A Report for Members of the Norfolk Agricultural Station
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THE TRIALS PROGRAMME

Over the last few years there has been a marked extension both in the problems under examination and in the proportion of the arable cropping area on the farm which is needed for trials work. In 1970 the scientific staff handled more than 5,000 individual plots, and for the first time the area of land required exceeded 100 acres. This burden of work places heavy demands on the scientific officers, and also causes serious complications as far as the commercial farming is concerned. In order to justify a programme of such magnitude the Station should be contributing in no small measure to the development of ideas and techniques that are to the advantage of Station members and the farming community alike. It may, therefore, be opportune to draw the attention of members to a few of the recently completed research projects that have been introduced successfully into general farming practice.

Undoubtedly the Station's work on the sugar beet crop—financed through the Sugar Beet Research and Education Fund—has contributed largely to the recent rapid advances in spring mechanisation. Not more than ten years ago the first attempt at "drilling to a stand" was made, and although this was received in the first instance with very great reserve, the technique is now much favoured by growers all over the country. The rapid acceptance of a relatively unproven technique has sometimes led some growers to attempt this form of mechanisation on soils not fully suited to a very low seeding. More recently the Station has evaluated and recommended the use of the "gapper" where seedbeds are difficult to prepare or where a poor germination may be expected.

There has also been a sustained effort to improve the proportion of beet seedling emergence, and the Station's latest work on seedbed preparation is now receiving considerable publicity. Any system of beet growing depending on a high degree of mechanisation demands adequate weed control by chemical means. For many years the Station has specialised not only in testing new chemicals but has also examined the use of more than one material either to give prolonged protection or the efficient control of a wider weed spectrum.

In the field of cereal production, the increasing impact of fungal diseases was recognised by the staff, and because of the work at Morley, members have had the advantage of results of local experimentation as early as, or in some cases before, any other part of the country.

Other aspects of current work being undertaken at the Station are dealt with in rather greater detail in the following pages of this report. However, more problems are arising constantly and every

attempt is made to fit them into the research programme. One such problem of major importance to a very wide area of the county has been high lighted by the publication of the Agricultural Advisory Council's report on "Modern Farming and the Soil". Members will be interested to know that steps are already being taken at Morley to examine the more important local aspects and this work will be given increasing prominence over the next few years.

POTATOES

Row Width and Plant Population

In 1969, the first year of the trial, 36 inch rows gave on average 2.5 tons of marketable ware per acre less than the normal 30 inch rows. However, part of this loss in yield was thought to be due to the wider rows suffering relatively more from weed competition and also from compaction due to tractor wheels at planting since the same 60 inch wheel setting was used for all plots. In 1970, these disadvantages were eliminated, as the dry conditions in the surface soil prevented undue weed growth and tractor wheels were matched to row width during planting and covering operations.

This year the 36 inch rows fared much better. Although yielding slightly less than the 30 inch rows at each of the three sett populations tested, the overall loss in yield due to planting the wider rows was only 0.7 tons of ware per acre.

For both row widths there was a small increase in yield as the seed rate increased. This was due mainly to an increase in the 1½–2¼ inch fraction. On 30 inch rows the increase was insufficient to justify a population greater than 13,000 setts per acre (16 inch spacing), but on 36 inch rows, it appeared to be worthwhile to increase the sett population to 17,500 (10 inch spacing).

These results are largely in agreement with those found at other experimental stations. From two years trial work it would appear that some yield loss may occur from the use of wider rows but the benefits of increased work rate during planting, inter-row cultivation and harvesting may well outweigh this. However, work will be continued to examine future responses under different seasonal conditions.

P.M.B. Variety Multiplication

To assist in assessing promising new varieties the Station is co-operating with the Potato Marketing Board in growing large scale plots to produce bulk samples of ware for subsequent storage investigations at the Board's Sutton Bridge Experimental Station. In 1969 "stock" seed of the following varieties—Pentland Hawk, Pentland Ivory, Pentland Crown, Pentland Dell and Ulster Concord were grown, together with Majestic as control. Samples of seed were saved from these plots and planted as commercial "once-grown" seed in 1970. Ware from this crop is now under storage investigation at Sutton Bridge.

Despite late planting, yields from the new seed in 1969 were quite good, although only Pentland Crown gave a higher yield than

the control variety (Majestic). The "once-grown" seed from these plots varied considerably in behaviour during storage and sprouting. There was up to 5% wastage in Majestic and Pentland Crown, mainly due to gangrene and some dry rot. By planting time, the shoots of these two varieties tended to be rather long and straggly. The other varieties suffered much less deterioration in store. Pentland Ivory produced rather longish shoots, but Pentland Hawk and Ulster Concord gave small sturdy shoots well suited to mechanical planting.

The level of foliar disease in the "once-grown" crop was only slight and was mainly confined to leaf roll. Ulster Concord and Pentland Dell were most affected while the other varieties only showed a very low level of infection. Subsequent yields appeared to be severely reduced by the dry weather.

A further series for multiplication began in 1970, using "stock" seed of the same varieties with the exception that Pentland Dell was replaced by King Edward. Pentland Crown and Majestic again gave the highest yields confirming the suitability of Pentland Crown for this type of land. The yield of the newer varieties, Pentland Hawk, Pentland Ivory and Ulster Concord was again disappointing when compared to Pentland Crown and these varieties did not perform up to expectations. Reports from elsewhere indicate that these new varieties have a higher potential than has been realised at Morley. Once-grown seed has been riddled from these plots and is due to be planted in 1971.

SUGAR BEET

Assessment of Pelleting Types

In Britain all pelleted sugar beet seed in commercial use is of one type—Filcoat pellets produced by Germain's. Seed pelleted by this process consistently gives good results, both in drillability and in subsequent emergence in the field.

There are several other seed-pelleting companies, both in this country and on the Continent, but their products have not been introduced for commercial use on sugar beet here as they have not, as yet, proved to be as reliable as Germain's pellets. In order to examine some of the continental pellet types and also to assess the effect of pelleting, a series of trials has been carried out at the Station, comparing emergence of different types of pellet from the same basic seed stock both in the field and in the laboratory.

In field trials there have seldom been large differences between the different forms of pellet tested and similar unpelleted seed has generally given the most satisfactory emergence. Of the pellets, Germain's have always given good emergence, similar to, or only just below that of the unpelleted seed. Other pellet types have been more unreliable, usually giving similar results to Germain's but occasionally resulting in a rather poor emergence. The largest differences found in field trials have been in the occurrence of multiple plants, indicating that the form and nature of the seed type is important for accurate seed placement during drilling and that, on occasions, there may be more than one germ in each pellet. In the

field in 1970 when five seed types from the same stock of Hilleshog Monotri were compared, Germain's pellets with their smooth uniform spherical shape produced only 1.4% of doubles, in contrast to the 12.3% from the unpelleted seed. "Royal Split" and "Linz" pellets produced even more doubles, apparently due to the roughness and lack of uniformity of the pellet coating.

Laboratory trials during 1969 and 1970 have compared emergence from pellets sown at three moisture levels, approximating to fairly dry, moist and relatively wet soil conditions. All pellet types gave their highest emergence under the drier conditions, although pelleted seed was several days later to germinate than unpelleted seed from the same stock. Under these conditions there was little difference in the final level of emergence between the different types. An increase in moisture enabled the seeds to germinate more rapidly but the final level of emergence was slightly depressed. As the moisture content of the sowing compost increased still further, emergence was depressed quite markedly from all forms of pellet, although unpelleted seed appeared to be less affected. On average, over two years, increasing the moisture content of the sowing compost from 32 to 57% resulted in a drop in emergence from unpelleted seed of 8%, and from pelleted seed of 25.8%. Two particular pellets, Knolle and Linz, gave rather poor emergence under wet conditions in 1969 and 1970 respectively.

It is difficult to relate results from the laboratory to practical field conditions. However, these experiments indicate that poor emergence, particularly of pelleted seed, may be directly attributable to rather wet seedbed conditions. Of course many cases of poor establishment may be due to seedbeds drying out, and for this reason it is hoped, in subsequent trial work, to examine germination under a range of fairly low moisture levels.

Variety, Plant Population and Distribution

In the 1969/70 season 41% of the British sugar beet acreage was drilled at a spacing of four inches or wider. The equivalent proportion for the 1966/67 season was 9%. This exceptional increase in wide spacing means that from now on a large proportion of the crop will be drilled to a stand and not touched by a hoeman. Consequently, population levels will vary more than they have in the past because they will be entirely dependent on climatic and soil conditions at the time of drilling and during seedling development. At the same time the regularity of the braird will also be affected and low field emergence will be directly related to poor distribution of plants along the row.

Only one variety, the monogerm Bush Mono, was used in the plant distribution trial which ended in 1969 following three years of investigation. However, at the present time it is felt that any variety which has a high degree of monogermity would be suitable for drilling to a stand. Multigerm polyploid varieties come into this category, with the additional advantage that their national average yields exceed those of the genetic monogerm types. Since varieties may react differently to varying populations and distributions three

varieties were included in the experiment which started in 1970. These were Bush Mono and Amono, both monogerms, and Sharpe's Klein Polybeet, a polyploid. Each of these was examined at four population levels and three degrees of regularity. The populations were derived from 6, 7½, 9 and 11¼ inch spacing and the three distributions were regular, irregular and very irregular. The regular stand was produced by drilling at three inches and hand singling to the populations achieved in the other two distributions; the irregular braird was achieved by sowing at the spacings listed above; and the very irregular crop was produced by drilling a mixture of dead and normal seed at a reduced spacing to compensate for the fewer viable germs.

In the first year of a trial such as this, only broad conclusions can be drawn because some of the differences achieved may only be pertinent to the year under consideration and do not exceed the inherent variations possible within the experiment. However, some of the results are worth mentioning at this stage. All three varieties had a high field emergence which exceeded 60% but that of the two monogerms was 7 to 10% higher than the polyploid variety. The sugar content of the varieties also varied, the results being as expected in that Sharpe's Klein Polybeet had the highest content and Bush Mono the lowest.

The root and sugar yields varied with population level and variety and must be confirmed by future work before any conclusions can be drawn.

The effect of increasing irregularity was similar to that found in previous experiments in that it increased yield of small roots and decreased total root yield, sugar content and sugar yield. As before, the effect of regularity on yield appeared to be greater at the higher populations. In the 1970 trial a loss in sugar of approximately 3.5 cwt per acre occurred from very irregular distribution compared with a regular stand.

Any of the interactions which may occur between variety and population or regularity will affect the decisions which have to be made regarding future crops that are grown under conditions of low labour availability. Therefore, it is hoped that the results from this trial in the next one or two years will help considerably in making a choice of varietal type and spacing distance to use.

Spatial Arrangement of Sugar Beet

Previous experimental work at Sprowston showed little difference in yield when beet was grown at 12, 16 or 20 inch row spacing within the population range of 20,000 to 40,000 plants per acre. In 1968 a further series of trials was started to examine the effects of 20, 24 and 28 inch rows over the same population range. If wider row spacings are practical without a large yield loss higher rates of work per acre might be expected throughout the season. Two levels of nitrogen manuring were also examined as it was thought possible competition for this nutrient might occur at very close intra-row spacing.

In 1970 the trial was undertaken both on the light soil at Sprows-

ton and on the rather heavier soil at Morley. At Sprowston the trial was drilled on 6 May with pelleted Bush Mono. The target plant populations were achieved satisfactorily by hand singling to marked strings with the exception of 40,000 plants per acre on 28 inch rows where a very close within the row spacing of 5.6 inches was required. Plant populations actually obtained and the sugar yields are given in the table.

Target Populations (per acre)	Row Width (inches) 20	24	28	Mean
	Actual population '000 per acre			
20,000	23.1	20.9	22.0	22.0
30,000	34.0	31.9	31.5	32.5
40,000	41.6	39.0	36.0	38.9
Mean	32.9	30.6	29.8	31.1
	Yield sugar cwt per acre			
20,000	45.9	46.2	41.8	44.6
30,000	56.7	44.7	45.2	48.9
40,000	58.5	48.4	45.8	50.9
Mean	53.7	46.4	44.3	48.1

The crop suffered severely from the effects of drought. The higher level of nitrogen caused yields to decline by 3.7 cwt per acre. Yields progressively declined with increasing row width especially at the higher populations. Sugar yield increased with increasing plant population at all row widths but especially on 20 inch rows.

The Morley trial was drilled on 7 May with Sharpe's Klein Polybeet and subsequently hand singled, again with the aid of marked strings. The actual populations achieved were close to the target populations with the exception of the highest population on 24 and 28 inch rows. The actual populations achieved and the yields of sugar are given in the table.

Target Populations (per acre)	Row Width (inches) 20	24	28	Mean
	Actual population '000 per acre			
20,000	23.5	22.8	21.2	22.5
30,000	31.6	31.7	28.6	30.6
40,000	39.6	35.0	32.3	35.6
Mean	31.6	29.8	27.4	28.9
	Yield sugar cwt per acre			
20,000	73.0	67.1	67.7	69.3
30,000	74.0	66.2	68.9	69.7
40,000	74.8	69.4	68.8	71.0
Mean	74.0	67.6	68.5	70.0

As at Sprowston the highest yields of sugar came from 20 inch rows, with little difference between 24 or 28 inch rows. Plant population had little effect at any one row width but on average sugar yield tended to rise with increasing plant numbers.

It is worth noting that in 1970 both trials tended to favour 20 inch rows and high populations which was contrary to the findings at Sprowston during 1968 and 1969 where sugar yields were at least as good from 24 and 28 inch rows with low populations. The spatial arrangement of a crop has always been a difficult problem since it involves both complex relationships of one plant to another and also to their total environment. In general a similar yield can be obtained over widely varying spatial arrangements. This wide range can, however, be narrowed dramatically under certain conditions. It is possible that the large and sustained soil moisture deficit encountered in 1970 might be such an environmental factor.

Sources of Magnesium for Sugar Beet

The Morley farm is situated on the Ashley soil series which can be deficient in soil magnesium. A long-term rotation experiment was started in 1969 in which substantial responses by sugar beet to magnesium were obtained. Magnesium is available in a number of forms and the first of a series of annual trials was started in 1970 to evaluate different sources of the element, four of which were tested, viz: Kieserite, calcined magnesite, a compound fertiliser containing magnesium and a sodium fertiliser containing magnesium. Two levels of magnesium were tested, 32 and 64 units per acre, the higher level in the case of the compound and the sodium fertiliser treatments being achieved by adding Kieserite in order to maintain the same levels of major plant nutrients.

Soil samples were taken before the trial started and showed an average level of 16 ppm (A.D.A.S. category O) of "available" magnesium. This low level of "available" magnesium suggested that responses to the 64 unit level might be expected.

YIELD OF SUGAR (cwt per acre)

Source of Magnesium	Units Mg per acre 32	64	Mean
Control	50.3		
Kieserite	51.5	53.5	52.5
Calcined Magnesite	50.6	50.5	50.5
Compound Fert + Mg	53.4	54.7	54.1
Sodium Fert + Mg	50.9	52.7	51.8
Mean	51.6	52.9	52.2

All treatments gave some increase in sugar yield above the control but responses were lower than expected. Kieserite and the compound fertiliser gave the largest yield responses and in both materials the source of magnesium is the same (magnesium sulphate). Calcined magnesite had little effect.

The increase in sugar yield appeared to be derived mainly from an increase in root weight as the sugar content of the roots was not affected. The yield responses were closely correlated with the number of plants showing deficiency symptoms in the field. Kieserite and the compound fertiliser containing magnesium gave the largest yield response and the lowest number of plants with deficiency symptoms.

Minimal Cultivations

The trial series conducted at both Sprowston and Morley during 1965 to 67 demonstrated the value of inter-row cultivation to be mainly that of weed control. If it were possible to completely control weeds by using herbicides then inter-row tractor hoeing could be eliminated if so required. Two problems are immediately apparent. Firstly, the herbicides at present available do not guarantee to provide a weed free environment throughout the growing season, and late germinating weeds can occur in certain seasons. The effect of these late germinating weeds on crop yield is not known and is the subject of the current minimal cultivations trial at Morley. The second problem is related to soil type. A soil type with an unstable crumb structure can slake or collapse under periods of adverse weather causing the soil surface to cap. It is possible that on such soils breaking the soil surface by inter-row hoeing or even a deeper cultivation may be beneficial in maintaining soil aeration. This aspect is being examined on a light silty soil near Boston which is subject to capping under adverse weather conditions.

At Morley six treatments are being examined which provide varying degrees of weed competition both within and between the rows. The treatments range from weed control by tractor and hand hoeing through varying combinations of tractor and herbicide work to the ultimate in mechanisation where weed control is entirely by a pre-emergence herbicide applied as an overall spray with no cultivations.

The trial was drilled to a stand with Sharpe's Klein Polybeet at 6 inch spacing on 23 April. Band spraying was carried out at the time of drilling and overall spraying of the necessary plots on 1 May. Early weed growth was negligible due to the very dry weather, and those plots which were designated for inter-row cultivations were tractor hoed once only on the 2 June. The hand hoeing treatments

Weed Control and Cultivation	Plant Population/acre	Sugar Yield cwt/acre
No herbicide; tractor and hand hoeing	36,300	76.9
Band sprayed; tractor hoeing	39,000	79.2
Band sprayed; tractor and hand hoeing	38,000	79.2
Overall sprayed; tractor and hand hoeing	38,200	77.7
Overall sprayed; hand hoeing	37,100	79.4
Overall sprayed; no hoeing	39,400	75.4

were carried out twice on the 9 June and 13 July as late germinating weeds were not a problem. The plant populations and yields of sugar are given in the table at the bottom of page 68.

A high plant population was obtained and there were no large differences between treatments. Where no herbicide was used and weed control was entirely by tractor and hand hoeing a slight yield loss was recorded, perhaps due to early competition from weeds within the row. No difference was found between plots which received inter-row cultivation and those which received none. Where the beet had been band sprayed and tractor hoed, further hand hoeing to remove late germinating weeds gave no benefit in yield. As in the previous year overall spraying benefited from hand hoeing to remove later weed growth.

At Boston where soil capping can be a problem the normal number of tractor hoeings was compared with restricted hoeing (once only). These tractor hoeing treatments were compared with or without the use of a cultivation tine 3–4 inch deep up the centre of the inter-row gap as an additional measure to combat soil capping. The use of an overall spray of a soil-acting herbicide was also investigated in combination with these cultivation treatments. An additional treatment representing complete mechanisation was also included consisting of an overall spray of the soil-acting herbicide with no post drilling cultivations at all.

The details of the treatments and the yields of sugar are listed in the table.

YIELD OF SUGAR (cwt per acre)

Cultivation and Herbicide	Tractor Hoeing		
	nil	restricted	normal
Overall herbicide			
No deep cultivation	76.3	69.0	72.1
Deep cultivation		73.4	71.0
No Herbicide			
No deep cultivation		73.3	66.1
Deep cultivation		77.1	69.4
Mean		73.2	69.6

Weed growth was not severe under the dry growing conditions of 1970 and was effectively controlled whether by tractor hoeing or herbicide. Where the normal number of tractor hoeings were given yields tended to be lower than where tractor hoeing was restricted to once only. This effect may well be a feature of increasing soil moisture loss from the greater number of inter-row cultivations in a dry year. Soil capping was not a problem and there was only a small advantage in yield from the deep inter-row cultivations. Yields were at least as good following the full mechanisation system consisting of an overall spraying with no post drilling cultivations. So far this trial series has not encountered a year with a severe capping problem.

Level of Protein in Fattening Rations

The results of a trial carried out in the winter 1967/68 comparing the feeding of two levels of protein in the fattening ration of Friesian and Hereford × Friesian steers receiving a high concentrate ration were given in The Morley Farm Vol. 1, No. 2, March 1969. Further trials were carried out in the winters of 1968/69 and 1969/70 comparing levels of protein in the finishing ration of beef cattle receiving bulk food plus concentrate supplement.

In 1968/69 twenty four autumn born Friesian steers were split into two groups on yarding when approximately one year old. The cattle were individually fed rations of 35–40 lb pea haulm silage and from 6–12 lb of a beet pulp and rolled barley concentrate. The concentrate was fed according to the liveweight of the animal and contained minerals and vitamins. The group of animals receiving the higher rate of protein supplement received 1 lb of cotton seed cake in place of 1 lb rolled barley thus receiving approximately 0.3 lb protein equivalent per day more than animals in the other group.

In the third trial during the winter 1969/70 a group of twenty yearling steers, comprised of 12 Hereford × Friesian, 4 Charolais crossbred steers and 4 Friesian steers, were divided between the two feeding regimes. The bulk feed part of the ration consisted of sugar beet tops during the early winter which were subsequently replaced by pea haulm silage and potatoes. The concentrate ration was again fed according to the animal's weight and was made up of two parts sugar beet pulp, 1 part oats and 1 part barley. 1 lb barley was replaced by 1 lb cotton seed cake for the higher protein level.

The mean daily intake of concentrates and protein equivalent together with the performance data of the animals are given in the table.

lb P.E. per hd per day	lb concentrate per head per day	Wt. at yarding Oct/Nov (lb)	Final live wt. at slaughter (lb)	Days to slaughter	Daily Live Wt. Gain yarding—slaughter
1968/69					
1.11	10.8	681	1070	166	2.36
1.42	10.9	678	1037	163	2.21
1969/70					
1.09	9.8	754	1039	153	1.82
1.38	9.8	751	1023	144	1.87

The results indicate that in these trials supplementing a bulk feed with a straight beet pulp/cereal concentrate provided sufficient protein to meet the animals requirements during fattening when the daily live weight gain was about 2.0 lb per head per day. In 1969/70, however, there was an indication that the higher protein fed beasts of a beef cross finished a little quicker but this was not shown the previous year when Friesian steers were used in the trial.

The results over three years suggest that the standard recommended protein feed for fattening cattle of 1.25–1.5 lb D.C.P. is very generous and in practice levels below this are adequate.

N.I.A.B. CROP VARIETY TESTING SCHEME

Sugar Beet

As in the previous season two trials were grown, a Preliminary trial of new varieties and a Main trial of varieties at a later stage of testing. In 1970 the latter trial also included all the recommended commercial varieties. Drilling was delayed by wet weather until late April, when an excellent seedbed was obtained and establishment and early growth were good. The dry summer did not seriously affect growth of the crop, apart from isolated areas showing symptoms of magnesium deficiency. Both trials were lifted at the end of September.

In the Commercial/Main trial, Sharpe's Klein E gave a yield of washed beet of 14.3 tons per acre and with a sugar content of 18.9% its sugar yield was 2.7 tons. The differences in sugar yield were not significant and ranged from Amono 9% below Sharpe's Klein E to Sharpe's Klein Megapoly 2% above.

Bolting was generally very low throughout the trial apart from Hilleshog Monotri where the level was 1.3%.

The highest yielding of the Main trial varieties was the West German monogerm MC. 73, with a yield 3% above the control, but again differences in sugar yield were not significant. This variety also did well at most other N.I.A.B. regional centres. AM. 18412, Bush Monogerm G, Desprez Monogerm, Mono Cambier and Monomer all gave sugar yields similar to that of Sharpe's Klein E. Bolting was low in this trial also.

In the Preliminary trial, Sharpe's Klein E gave a lower root yield of 13.2 tons, but with a sugar content of 20% its sugar yield was 2.6 tons. The French monogerms Monalba and Monolepeuple exceeded this by 7% and 3% respectively but again differences in sugar yield were not significant. Yields similar to the control were obtained from Amono, Hilleshog Monotri, Hilleshog "New" Monotri, Poly BBC and VT. 137. Bolting was generally low throughout the trial but exceeded 1% in the two Hilleshog varieties.

Maincrop Potatoes

Planting was not possible until 1 May, but emergence was very rapid with good establishment. The very dry summer did not appear to affect the crop seriously, although slight symptoms of magnesium deficiency were noted. No blight was seen and when the tops were burnt off on 16 September, very little senescence of foliage had occurred.

Yields were quite good in view of the short growing season and lack of moisture. Majestic produced a total sound yield of over 17 tons, but because of cracking and severe common scab infection the yield of marketable produce was less than 1 ton.

King Edward gave a total sound yield of just under 15 tons. Much of this was below 1.5 inches in size, and there was considerable loss due to common scab, although infection was less severe than in Majestic. Marketable yield over 1.5 inches was 9 tons, but with a relatively small tuber size the yield over 2 inches was only slightly over 5 tons. Pentland Crown gave a similar total yield to King Edward, but with only moderate substandard produce, mainly from greens, its saleable yield over 1.5 inches was above 12 tons, of which 11 tons was in the larger grade.

Of the three varieties undergoing test the best performance came from Stormont Enterprise. Its total sound yield was 16 tons, but with relatively small tuber size and moderate scab infection its saleable yield was 12 tons, of which 3 tons was below 2 inches in size. S.62/47/1 (M.A.N.I.) and K.154 both gave marketable yields of around 9.5 tons, the latter variety suffering moderate wastage due to common scab.

Vining Peas

Drilling of this Main trial of 14 varieties was delayed until late April, about one month later than normal. However with the hot dry summer experienced, harvesting was completed at least two weeks earlier than normal. With such a short growing season yields were inevitably low. In the case of the later varieties very rapid ripening occurred and with tenderometer readings escalating, difficulties were experienced in obtaining three consecutive harvests between readings of 95 and 130.

Sprite, the early control, produced 36 cwt at the freezing stage (tenderometer 100) and just under 2 tons at the canning stage (tenderometer 120). The late control Dark Skinned Perfection gave 37 and 41 cwt at the corresponding stages.

The earliest variety was Hurst Beagle, some three days earlier than Sprite. Its yield at the freezing stage was well below the control but only marginally less at the canning stage, and it produced a large proportion of peas in the small and medium grades ($\frac{8}{32}$–$\frac{11}{32}$ inch and $\frac{11}{32}$–$\frac{13}{32}$ inch respectively). Sleaford Orbiter produced comparable yields to Sprite at both stages but with a greater proportion of large peas. The highest yielder in the trial was Martus, a variety of medium maturity and rather large sieve size. This variety gave yields well above both controls at each stage of harvesting.

The continuous hot dry weather of early July may have affected the later maturing varieties more than the early group. Dark Skinned Perfection yielded only 2–3% above Sprite and all the later varieties, with the exception of Bonus, were below the late control. Bonus outyielded Dark Skinned Perfection at the freezing stage but was marginally below at the canning stage.

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