THE SPROWSTON FARM

A Report for Members of the Norfolk Agricultural Station
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THE FARMING.

Winter Wheat. Sprowston did not escape the troubles of the wet harvest; most of the corn was laid and some grew as it was standing. Despite the difficulties, however, nearly all the experimental plots were harvested safely. The exception was on the Straw Disposal Trials where some of the treatments produced the worst attack of Eye Spot we have so far seen, and the crop was so flat on the ground that it sprouted almost from every ear. The affected plots were those where straw is continuously applied, either ploughed in or as the residue of a cereal crop and it seems possible after all, that straw may carry the disease from crop to crop. It is an experience worth remembering.

Bad seasons, however, are not without their value on an experimental farm: and often enable better observations to be made on such important characteristics as capacity to stand, disease resistance and response to fertilisers.

The winter wheats Hybrid 46 and Cappelle Desprez, sown as commercial crops both stood very well although manured with a total seedbed and top-dressing equivalent to 4¼ cwt. per acre of sulphate of ammonia. Responses were not as bountiful as usual and had we been able to forecast the wet summer we could have saved some of the nitrogen bill. For the first time since we have grown the good standing French type wheats they did not respond to more than a total of 3 cwt. per acre of sulphate of ammonia.

Fortunately we were able to harvest the 32 acres of winter wheat without using the binder and although there was no difference between the two varieties in resistance to growing in the ear (both grew slightly but not disastrously) there is no doubt that had such heavy crops been cut and stooked growing would have been very considerably increased.

In the end we threshed, dried and sold 782 coombs from the 32 acres or 24½ coombs per acre—the heaviest crop of winter wheat so far grown on a field scale at Sprowston.

Beeston Hyrne, the field on which most of it was grown has not been mucked during the Station's occupation; it has been deliberately farmed without muck for 12 years to see what would happen. So far it crops well: beet tops and the clover aftermath and the straw are all ploughed back.

Vining Peas. This now very important crop at Sprowston and elsewhere in the county also had its up-and-downs during the summer. We ended the pea harvest in mid-August with two tractors in front of a loaded lorry. The average yield of the 60 acres was just under 31 cwt. of peas per acre, which considering the difficulties, was a satisfactory result although by no means representing the full possibilities of the crop.

Since all the available evidence for growing peas of any kind favours a narrow row width for high yields we drill with a corn drill in 7 inch rows and trust to spraying to control the weeds.

Until this year we have killed all the weeds by spraying, without damaging the peas. Occasionally the peas have been scorched, but this year we killed 11 acres by spraying. All is not known, as yet about the conditions necessary for successfully spraying peas and we were very unlucky with the weather. Just about the only two really hot days of last summer arrived just as we had sprayed and the concentration of the spray proved too much and we were forced to re-drill.

Accidents like this, not only upset the delivery programme, but reduce the yield, especially if a late variety like Alderman is used in the re-drilling. This variety yielded 26 cwt. of vined peas when drilled at the normal time and less than 10 cwt. per acre drilled late (mid-May). Thomas Laxton and Perfection are much more successful at Sprowston and our heaviest yields are always from Perfection.

We planned some experimental cropping to follow the early peas, but their loss spoilt our plans. We did however catch crop small areas with white turnips, cauliflowers, brussel sprouts, cabbages, the last three from plants, and had intended to drill carrots but were unable to do so.

Catch cropping at the beginning of July is necessarily hazardous but the cauliflowers and cabbages succeeded, and of course the white turnips, but the sprouts have not so far shown much inclination to button and do not seem likely to crop.

The white sprouting broccoli is a promising crop for planting after early peas but judging from this year's experience it is a heavy labour absorber; the picking is a slow and lengthy process.

Livestock. In the autumn of 1952 we reared 14 Friesian bull calves and as reported in the Annual Report, picked the best out and managed to fatten them at 20 months old weighing just under 10 cwt. live weight. The fellows to these, admittedly not so forward in condition, weighed almost exactly the same on the 12th November, six months after their mates had been sold, and after outwintering on tops (and then pulp) and straw and a summer grazing.

These cattle are comparable in weight with the stores just bought to complete the winter feeding programme. The home reared stores have cost 116/6 per live cwt. (with calf subsidy deducted) those purchased 129/-.

The whole have just been yarded and will be fed on 60-80 lb. pea haulm silage or the equivalent feeding value of beet tops, 5 (increasing to 7 lb.) beet pulp, and 5 to 7 lb. crushed oats and 5 lb. hay daily.

We are repeating the experiment comparing multiple suckling and pail feeding with a milk substitute. The yearlings resulting from last year's trial were weighed on the 12th November. Those pail fed weighed 5½ cwt. and those reared on nurse cows were ½ cwt. heavier. A further attempt is being made to finish some of these yearlings out of the yards in April or May. If this system, namely, beef at 20 months old weighing 9 to 10 cwt. live proves possible, it would fit nicely into the Sprowston farming, where it is necessary to use as little grass as possible if the gross output of £55 to £60 per acre (including grass) at which we aim is to be achieved.

RESULTS OF CEREAL TRIALS 1954.

The results of the cereal trials carried out during 1954 are summarised below and where possible a contrast is made with those of previous years. Members are reminded that results from one year's trials should be treated with caution. This is particularly true of this year's results which were probably affected by the lodging which occurred in most trials as a result of the poor weather at harvest.

WINTER WHEATS.

Nitrogen, Row-width and Seedrate Trial. The short-strawed French type wheat Hybrid 46 has been tested under various conditions of seedrate, row-width and level of nitrogenous top-dressing during the past three years. The experimental treatments in 1952 were all combinations of the following :—Seedrate—1¼, 2½ and 3¾ bushels per acre : Row-width—4″, 8″ and 12″: Top-dressing—1½, 3 and 4½ cwt. sulphate of ammonia per acre (applied late April or early May). In 1953 and 1954 the top-dressings were 2, 4 and 6 cwt. nitro-chalk, row-width and seedrate remained the same. These rates of nitro-chalk contained the same amount of nitrogen as the levels of sulphate of ammonia in 1952.

In the first year the yield from the 4″ row-work was 19½ sacks per acre with a reduction of 1 sack when drilled on 8″ and a further 1 sack decrease from the wide rows. The high seedrates gave the best results, 3¾ bushels yielded 19¼ sacks per acre, at 2½ bushels the yield was 18½ sacks and at the low seedrate 18 sacks were produced. At the lowest level of top-dressing (i.e. 1½ cwt. sulphate of ammonia) the yield was approaching 18 sacks and increases in yield of ½ sack per acre were recorded from each additional 1½ cwt. of sulphate of ammonia. In 1953 the 4″ work again gave the highest yields and similar results from the top-dressing treatments were recorded. The level of the response of the crop to the two additional doses of nitrogen in the second year was much greater. At 2 cwt. nitro-chalk the yield was 16½ sacks and each additional 2 cwt. of nitro-chalk produced 2¾ and 1¼ sacks per acre respectively. High seedrates gave significantly lower yields compared with the medium and low ones in 1953. Narrow rows and low seedrates gave the best results in 1954 but the higher levels of top-dressing were not responsible for increases in yield. The wet summer was mainly responsible for this, plots receiving the top levels of nitrogen went down earlier and to a greater extent than in previous years.

The results of the three trials may be summarised as follows :—

(1) Hybrid 46 drilled on narrow rows has consistently given the highest yields.

(2) In two years out of three the lower seedrates have out-yielded the medium and high rates.

(3) In two years out of three significant increases in yield have been obtained from the two additional doses of nitrogen.

Rather conflicting results with regard to seedrate have been experienced and it is necessary to repeat this trial in order to obtain more definite conclusions.

Time of Top-dressing Trial. A second trial using Hybrid 46 is in progress and two years results are now available. This was designed to test four spring top-dressings on wheat sown at two

dates in the autumn (October and December), with and without a compound fertilizer applied to the seedbed. The top-dressing treatments were—(a) No top-dressing. (b) 4 cwt. nitro-chalk applied early (mid-March). (c) 4 cwt. nitro-chalk applied late (Late April). (d) A split dressing, 2 cwt. early plus 2 cwt. late. The seedbed compound was equivalent to 1—1½ cwt. sulphate of ammonia, 1½—2 cwt. superphosphate and ½ cwt. muriate of potash. In both years the wheat followed a one year clover ley.

The results in the first year, which appeared in the first edition of *"The Sprowston Farm"*, showed an economic increase of 1½ sacks per acre from the addition of compound fertilizer to the seedbed and ½ sack per acre in favour of the early drilling in October. On an average 4 cwt. of nitro-chalk applied as a spring top-dressing gave an extra 4 sacks with the split dressing slightly higher than the two single applications. The 1954 results were similar to those experienced in the first year. Early drilling out-yielded the later drilling by 2½ sacks per acre and the addition of compound fertilizer to the seedbed resulted in an increase of ½ sack per acre. The 4 cwt. of nitro-chalk as a top-dressing resulted in an extra 2 sacks per acre with little difference between the three ways of application, however the split dressing was again slightly higher than the single early or late application. Harvesting conditions in 1954 were generally poor owing to lodging but this trial was one of the few exceptions.

The results from only two years work have to be viewed with caution but the indications arising from them so far have shown.

(1) Early drilling in October gave higher yields than the later one in December.

(2) 4 cwt. nitro-chalk produced economic returns in both years and the split dressing was the best. Also when all the top-dressing was applied in late April it appeared rather too late for the crop to make the most efficient use of it. This was particularly true for the early drilling.

(3) A compound fertilizer applied to the seedbed has given an increase in yield in spite of the fact that the wheat followed a one-year ley. Where this seedbed fertilizer was applied to the late drilled plots the top-dressing of nitro-chalk has not always produced an increase in yield. This suggests that compound fertilizer should be used only in the case of early drillings and that with later drillings the 4 cwt. nitro-chalk top-dressing is sufficient.

SPRING WHEAT.

Nitrogenous Manuring. This trial was a repetition of one carried out last year to determine the economic level of nitrogen for Atle spring wheat. The treatments were a control receiving no nitro-chalk and plots receiving 2, 4, 6 and 8 cwt. of nitro-chalk per acre applied either all on the seedbed or half on the seedbed and half as a top-dressing in late May. The 8 cwt. level was an additional treatment since an economic return was obtained from all dressings up to 6 cwt. last year. The wheat was the second white straw crop after 4 years timothy for seed.

In spite of the heavy dressings the crop stood well until the middle of August when the 8 cwt. plots went down under heavy

rain; the 6 cwt. plots followed later and by the time the trial was harvested all other plots except the controls were leaning.

Ears were counted just before harvest and showed that each 2 cwt. of nitro-chalk increased the number of ears by about 12%, the top level having half as many ears again as the control.

The yield of the trial as a whole was very good, the control plots producing 13¼ sacks per acre. Two cwt. of nitro-chalk increased the yield by 2¼ sacks and a further 2 cwt. raised the yield by 1¾ sacks to a total of about 17¼ sacks per acre. When the dressing was increased to 6 cwt. the yield only increased by an extra ¼ sack giving the top yield of 17¾ sacks per acre. The top rate of 8 cwt. actually reduced yields to below the 4 cwt. level.

Split dressings gave no benefit at all in contrast with last year when they produced an extra 1½ sacks per acre.

This lack of response to anything more than moderate (by new standards) dressings of nitrogen, is in keeping with the results of the winter cereal trials.

The winter row-width, seedrate and level of nitrogen trial on Hybrid 46 wheat showed no benefit at all from any top-dressing over 2 cwt. of nitro-chalk, and in the trial summarised above, the maximum economic return was given by 4 cwt. of nitro-chalk, in comparison with last year, when a profitable yield was gained from 6 cwt.

Nitrogen, Row-width and Seedrate Trial. As an extension to the previous trial a trial was laid down to test the effect of seedrates, row-width and nitrogen in similar fashion to the winter wheat trial mentioned earlier.

The treatments were: three seedrates 1½, 2½ and 3½ bushels per acre; two row-widths 4" and 8"; and two levels of nitrogen 3 cwt. and 6 cwt. of nitro-chalk applied as split dressings. Ear counts at harvest showed that extra nitrogen increased the number of ears by about 10%. Higher seedrates naturally increased ear numbers but row-width had no effect.

The average yield of the trial was 15½ sacks per acre. Taking the various treatments one by one, 4" rows showed a slight benefit of an extra cwt. of grain over 8" rows, and the high nitrogen increased yields by 2 cwt. per acre.

The effect of seedrate was as expected, low seedrates gave the lowest yield, the medium and high seedrates gave roughly the same increase of about 2½ sacks per acre.

WINTER BARLEY.

Time of Top-dressing Trial. In 1952 and 1953 trials were carried out on the time of application of spring top-dressings to Pioneer winter barley. This year a further trial was conducted in order to give a full sequence of three years' results.

In this year's trial the treatments were similar to those applied in 1953: a total of 5 cwt. of nitro-chalk was applied as a single top-dressing on three different dates in the spring. This total of 5 cwt. was also split into two or three successive dressings applied on two or all of the three dates in the spring. This year the three dates were: 8th March, 9th and 29th April. Control plots, receiving no top-dressings, were also included in the trial.

The trial was drilled during October, 1953 on land that had previously been cropped with potatoes. During the following July

extensive lodging took place on all plots that had received the spring top-dressing.

The trial was harvested in mid-September and the yields varied between 14 sacks per acre on the control plots and 15.3 to 19.1 sacks per acre on the plots which had been dressed with nitrogenous fertilizer. The early unsplit top-dressing gave a yield of 19.1 sacks which was significantly greater than the yield from the control plots and the plots which had been given unsplit dressings in mid or late spring. These last two treatments produced 15.3 and 16.1 sacks per acre respectively. The plots on which the total top-dressing had been split into two or three applications during the spring yielded an average of 17.2 sacks per acre, which though significantly more than the control, is of no advantage compared to the 19.1 sacks yielded by the plots which had been given a single top-dressing in early March.

These results are fairly consistent with those gained in 1952 and 1953, when the single top-dressings applied in early or mid-spring gave higher yields than the late spring dressing and when the splitting of the top-dressing into two or three applications gave no additional benefit.

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

Winter Wheats. In 1954, there were two winter wheat trials, one trial of soft milling wheats with Bersee as the control variety, and the other of quality wheats with Bersee and Hybrid 46 as the control varieties.

Heine's VII was included in the first of these two trials. Its yield was very similar to that of Hybrid 46 in an adjoining trial. The grain was well filled and it appeared to be free from Yellow Rust and Loose Smut.

In the second trial none of the quality wheats showed any marked superiority in yield over Bersee and all of them yielded well below Hybrid 46. All varieties showed some sprouting, this being most severe in Holdfast.

Both trials received two levels of nitrogenous top-dressing. At the higher level of nitrogen only two varieties (Hybrid 46 and Holdfast) showed slight yield increases; eight varieties showed slightly depressed yields while Bersee gave a small increase in one trial and a decrease in the other.

Spring Barleys. The two N.I.A.B. trials were the International Spring Barley Trial and a trial comparing Proctor and Rika at different levels and times of application of nitrogen.

The International Barley Trial has now been carried out for four years at Sprowston. German, Danish, Swedish and English varieties have been included in previous years and this year, for the first time, a French barley Busser has been on trial and Carlsberg has been replaced by Carlsberg II which is a new selection from Carlsberg.

Four varieties have been in the trial since its inception, Kenia (Danish) as the control variety, Herta (Swedish), Haisa II (German) and the Carlsbergs (Danish); Proctor has now completed its second year. All these varieties have generally outyielded Kenia while Proctor, Haisa II and Carlsberg have normally given better quality malting samples than Herta and Kenia.

This year conditions were not favourable for the production of malting quality barley and none of the varieties gave particularly attractive samples. All varieties lodged, the first to go down being Busser and Haisa II. Some sprouting occurred and there was some cracked and rotting grain, especially with Proctor.

In the trial comparing Proctor and Rika at different levels of nitrogen, Rika outyielded Proctor at all levels of nitrogenous manuring. Rika is normally regarded as a feeding barley.

Two new English malting barleys Maythorpe and Provost are being distributed this year through the seed trade to Fellows of the N.I.A.B., by the Council of the N.I.A.B.

Maythorpe posesses the general field characters of the "Scandinavian types" together with an outstanding feature of early ripening, being as early as, if not slightly earlier than Kenia. In quality and 1,000 corn weight Maythorpe compares favourably with Kenia. It is being offered as a spring barley for those areas where earliness in ripening combined with desirable qualitative features are required.

Provost barley is of the Spratt Archer type with shorter straw but ripening perhaps a day or two earlier. It is 5 to 6" shorter in the straw than Spratt Archer and considerably stiffer and is a suitable variety for spring sowing in the major malting barley areas of England. It is capable of producing grain equivalent to Spratt Archer in malting quality and its ability to stand in the field for considerable periods without lodging makes it valuable and suitable for end of season combining.

Spring Wheats. Three German varieties Peko, Koga and Koga II were included in the Spring Wheat Trial, in which Atle was control variety. 1954 was a bad year for Atle which makes it more difficult to assess the performance of varieties tested against it. Koga and Koga II gave almost identical yields, both giving rather better results than Atle. Peko gave much the same yield as Atle. Both Peko and Koga are soft milling wheats. Koga II, which is in trial for the first year is not a selection from Koga; on the Continent it is reported to be a short, stiff strawed variety of baking quality.

Spring Oats. In 1954 no variety yielded more than Sun II which was the control variety. Libertas has now completed its third year in trial; it has not outyielded Sun II during this period and it is slightly longer in the straw.

TURKEY FEEDING.

Successful turkey rearing depends on sound breeding and management and in the latter case feeding is of great importance.

Turkeys are capable of very fast rates of growth but these will only be obtained if, among other factors, feeding is good.

Keeping birds on range will not alter their nutritional needs but it will allow the bird to help to balance its own diet and simpler rations may be fed successfully. Under intensive veranda or strawyard conditions the bird is dependant on its ration for all its nutritional needs.

Methods of presenting feed are also important. Pellet feeding will probably give slightly better growth rates but will also give the birds longer time to stand around and peck each other. On the other hand mash on range would soon blow away. Wet mash may

stimulate apetite but unless scrupulous cleanliness is observed, souring of feed can easily take place with disastrous results.

The rations at the Turkey Demonstration Centre are :—

Ingredient	Starter 0-8 weeks %	Grower 8-16 weeks %	Finisher 16 weeks to disposal %
Cut wheat (ground for growers) ..	16.2	20.6	32
Ground oats	15	20	25
Ground maize	15	15	
Finely ground barley	5	10	30
English prepared decort. ground nut meal (50%)	15	7.5	
English white fish meal (65%) ...	10	7.5	
Meat and Bone Meal			11.26
Grass meal (250—17%) ...	10	10	
Unextracted dried yeast (48%) ...	5	5	
Dried separated milk	5		
Sterilised steamed bone flour ...	1.2	1.9	
Limestone flour	1.8	2.1	1.25
Vitamin—mineral supplement ...	.4	.4	.4
Choline supplement	.4		

Starter ration is fed as a mash; grower as a 3/16" diameter pellet as is the finisher. Flint grit is given weekly up to 6 weeks and *ad lib* after this.

Analysis of Rations (approx.)

	Starter	Grower	Finisher
Protein	24	20	15
Crude fibre	5	6	5
Lime (as CaO)	2.8	2.9	2.9
Phosphoric acid (P2O5) ...	2.2	2.3	2.2
Vitamin A	4000 i.u. per lb.		
D3	800 i.u. per lb.		
B2	2 mg per lb.		

Vitamins A and D3 are present in stabilised form to reduce the risk of oxidation.

From 0—16 weeks the feed is expensive but to date on 700 males and 700 females we have obtained food conversion figures of 3.2—1 for the males and 3.4—1 for the females and to 16 weeks a mortality of 5%. These results we believe are due in no small way to our feeding methods.

The Sprowston Farm is a progress report and its contents are confidential. The report is punched for filing, and files can be obtained from the Office, price 5/9d. each post free.

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