

MAXIMUM WHEAT PRODUCTION FROM SPRING SOWN WHEAT

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INTRODUCTION

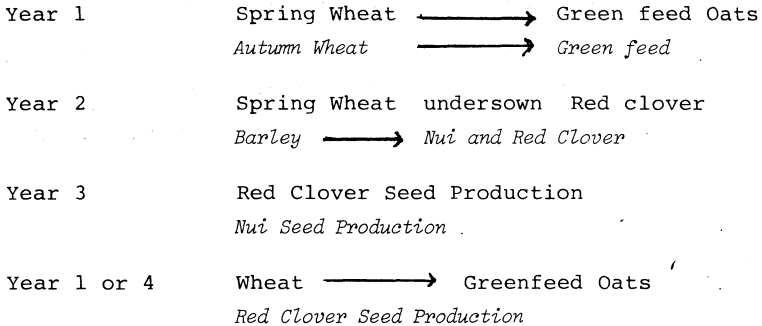
I farm in Oxford on a 129 ha property of Coopers Creek loam that is extensively drained. The rainfall is between 1250 mm and 1500 mm although this year it looks as though it might reach 200!

I grow 65 ha of wheat - all but 8 ha is spring wheat; 32 ha red clover; 10 ha perennial ryegrass; 9 ha white clover; 6 ha barley and 0.5 ha blackcurrants as an experimental plot. I also run 1,200 Drysdale wethers for wool - their job is to utilize crop residues. The sheep are grazed out during December and whenever otherwise necessary.

Although there are some variations, I have a basic three year crop rotation (Figure 1). Variations to the rotation are shown in italics.

The question many will be asking is "Why so much spring wheat?" The answer is that although my property is extensively drained, it is still not drained sufficiently to be able to grow autumn wheat; however I do intend to continue my drainage programme and in time replace the first wheat crop in my rotation with autumn wheat. This

FIGURE 1. CROP ROTATION



would also help spread my work load.

Why Maximize Wheat Yields?

In my view the reason why we must maximize wheat yields is purely financial. The difference in net profit from a low yielding crop - 2.5 t/ha and a high yielding crop of 5 t/ha is three times greater. Therefore if we double our yield we treble our net profit.

Three years ago my average yield was 2.9 t/ha; now the average is 4.6 t/ha with my best being 6.58 t/ha.

THE IMPORTANCE OF WHEAT

The main reasons I grow wheat in preference to other crops are:

Profitability

Wheat in my view is the most profitable of the commonly

grown crops. 4.5 t/ha gives \$500/ha net profit.

Reliability

It is reasonably wind resistant and most diseases can be controlled. Wheat suffers less than barley and other crops from moisture stress and other adverse climatic conditions.

Wheat Fits In

Wheat fits in well with any rotation and if necessary can be grown up to three years in succession without adverse effect.

TARGET CONCEPT

My aim in wheat growing is to obtain 10 t/ha. Although many of you will think this figure is unrealistic I believe one must set goals high otherwise they are achieved too easily.

To obtain 10 t/ha we require 600 ears/sq metre., 40 grains per ear and a thousand grain weight (T.G.W.) of 42 grammes.

To achieve 600 ears/sq metre we require 400 plants per sq/m giving one and a half tillers per plant. Bearing this in mind I sow my wheat to establish 400 plants per square metre.

ESTABLISHING THE WHEAT CROP

Seed Bed Preparation

The paddocks are ploughed between late July to late August

and are left for two weeks before they are cultivated by one pass with a rotary cultivator. A second rotary cultivation is sometimes needed. For spring sowing, ground should be reasonably fine but not too fine.

Sowing Date

Hilgendorf - before mid September. Rongotea - as soon as possible from the beginning of September. No use planting in wet muddy conditions; wait until paddocks dry out.

Variety

The main variety I intend sowing in the coming season is Rongotea with a small amount of Hilgendorf.

The reasons for sowing Rongotea are:

Yield In trials I have conducted, Rongotea has out yielded all other spring wheats with very low screenings (1 - 2%).

Price Rongotea is basic price and therefore no deductions.

Character Rongotea is rust resistant, and with the use of Baytan Seed Treatment should control mildew - this being the main fungal disease affecting spring wheat. Rongotea does not, as a spring wheat, grow too tall and lodge.

Similarly, my reasons for growing Hilgendorf are:

Character Rust and mildew control is easier and more effective; yields are correspondingly better.

Price The 20% above basic price coupled with good yields

for the variety make it an attractive proposition.

Sowing Rate

Sow to establish 400 plants per square metre. To do this, multiply thousand grain weight X 5.7. The arithmetic result of that is the sowing rate in kg/ha. (Note that this is for spring wheat only.)

Seed Treatment

I will be using Baytan F17 Seed Treatment to help control mildew and rust and hopefully this treatment will eliminate having to spray later.

Fertiliser

I carry out soil test on some paddocks. My normal application of fertiliser is between 250 kg/ha and 375 kg/ha of Crop Mix N.P.K.S. 6-6-5-13. You will note this fertiliser has the same nitrogen as N Super but in addition contains 5 units of Potash essential for straw strength. My land is slightly low on potash. It is also interesting to note that Crop Mix is only slightly dearer than N Super (about \$3. per tonne) and it does not, in my experience, go hard.

Drilling

Drilling speed should not be more than 8 km/hr although I will admit when I am in a hurry I sometimes go faster. Use a small tractor - then you can not go too fast!

Depth

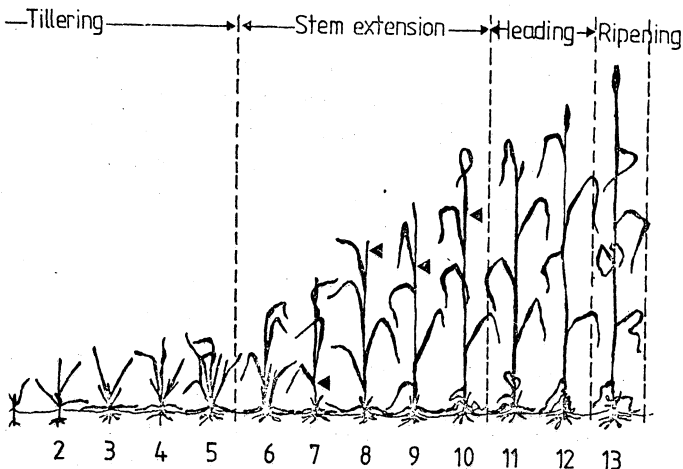
I work on drilling depth of 60 mm. Some advisors are

ding 25 mm but I believe that this is good in
out very hard to achieve in practice - half the
ls up on top of the ground if a heavy rain comes
er drilling. Better slightly deep than too

t of the Growing Crop

illing many people tend to shut the gate and go
in at harvest time and wonder why they do not get
ield. Wheat, I believe, is like a woman - to
a good yield they both must be pampered.

GROWTH STAGES IN CEREALS



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Usual spray is MCPA and Dicamba to control usual
first crop wheat and in undersown crops MCPB or

24DB. Last year I did not spray some paddocks, thinking it unnecessary at the time, but because of the wet season ran into problems at harvest time and wished I had sprayed.

Nitrogen

I apply 250 to 375 kg/ha of ammonium sulphate, according to test and paddock history, at growth stage $2\frac{1}{2}$ to 3. The reason I apply nitrogen at growth stage $2\frac{1}{2}$ is that nitrogen takes two weeks to be taken up by the plant and by this stage the spring wheat plant has reached G.S.5. This is the critical stage for ensuring a large number of grains per ear.

In my opinion the timing of nitrogen application is more important than the amount applied. If the paddocks are too wet to get over with the tractor, as they were last season, then apply by aircraft with double overlap.

Growth Regulator

I intend using cycocel as a growth regulator on my Hilgendorf at G.S.6. This will be incorporated with the weed spray.

I had an experience this season with Hilgendorf growing very tall and going flat - consequently yield loss. The Rongotea on the other hand grows shorter and more erect and does not need cycocel. Cycocel also helps stop eye-spot.

Fungus Control

Mildew With the use of Baytan F17 Seed Treatment I hope it will not be necessary to spray for mildew; but if necessary

I use Bayleton at 250 ml/ha.

Rust Rongotea being rust resistant should be all right - but I still check for it twice a week.

Hilgendorf - will spray for rust if I notice pustules building up - with Bayleton at 500 ml/ha. I do not spray at first signs of rust but let the spraying contractor know; we spray when pustules have reached two per leaf. This requires close monitoring - every two to three days.

Pests

Up until now I have had no problem with any pests, but I inspect for them regularly and if found would take the necessary action.

Harvesting

I harvest as soon as the crop is mature and the moisture comes below 17% moisture.

My yields for last season averaged 4.65 t/ha with my best being Rongotea at 6.58 t/ha.

Figure 3 shows the components of yield of a 10 t/ha crop and the components of yield of my 6.58 t/ha crop. From this you will see the points I have to pay attention to next year.

THE 1979-80 HARVEST

What Went Wrong?

First of all the establishment of plants per square metre

FIGURE 3. COMPONENTS OF YIELD (SPRING WHEAT)

Theoretical yield	Plants per sq metre	Heads per sq metre	Grains per head	Thousand grain weight	Estimated yield
10 t/ha	400	600	40	42	10.08 t
6.58 t/ha	370	573	29.9	43.8	7.5 t

was insufficient. This was due to a poor germination line of Rongotea seed wheat last year. This led to an insufficient number of heads per square metre.

Secondly, the number of grains per head was lower than desirable due to the nitrogen being *applied* at growth stage 5 instead of being *available* to the plant at growth stage 5. Apply nitrogen at correct time - growth stage 2½ to 3 for spring wheat.

Finally, there was a greater than tolerable difference between the estimated yield and the actual yield - up to 10%. This was due to adverse weather conditions at harvest time. Harvest as soon as possible after maturity even though the moisture may be high and the grain requires drying.

What did not go Wrong?

The thousand grain weight was well up being 43.0 grammes. With a T.G.W. of 43.9 grammes and 600 heads per square metre we would then have only needed 38.25 grains per head to achieve 10 t/ha. As the T.G.W. increases the grains per head may decrease. The converse is also true.