PROGRESS IN COMMERCIAL VARIETIES - WHAT'S AROUND THE CORNER HERE AND IN THE U.S.A.

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INTRODUCTION

In agriculture we often hear reports of new wonder varieties that are about to revolutionise agriculture, yet when these varieties are released, if indeed they are released, they seem to fall far short of the publicity that heralded them. A major technological break-through in variety development is rare. Most improvements come in rather small steps. In the next few years improvements will be in small but positive steps.

It is my endeavour here to present you with an objective assessment of what you, the grower, can hope to expect from cotton varieties in the near future.

WHY CHANGE VARIETIES AT ALL?

We should start this examination by asking the obvious question of why should we change varieties in the first place? Of course if you are a grower the answer is simple. Growers will change variety for a perceived improvement in yield, grade or a more stable micronaire. While these reasons are fine we as an industry should really look where our cotton sits in the market place. Improved yield is worth little if we can't sell the lint or if it brings a lower price. The needs of the market are supreme and we need to keep in view what the market wants from us. Commercial history is littered with industries that didn't heed the requirements of the market and lost out to competitors. We have a formidable competition in the synthetic fibre industry.

At present the spinning industry prefers a stronger fibre than we presently produce with Deltapine 61. It also appears that the latest developments in spinning will continue this demand for higher and higher strength fibre. Our primary aim should be to develop a stronger fibre. If we can improve yield and other fibre qualities at the same time, all the better. Not only will this improve our sales position but we can also improve the returns of the grower.

THE SOURCE OF NEW VARIETIES

The Australian Cotton Industry is in a rather unique situation with regard to varieties. The factors leading to this unique position are:-

(i) there is only one cotton planting seed company operating in Australia

(ii) the company does not engage in plant breeding at all

(iii) there are no plant variety protection rights operating in Australia yet

Cotton Seed Distributors Ltd is able to scout the world for potential new varieties and objectively evaluate each one. Most overseas seed companies are willing to supply experimental seed to us with the understanding that a reasonable royalty would be paid if the seed was to be used commercially. The conditions have helped to keep royalty levels in check. However, a change in any of these three conditions would undoubtedly lead to higher royalties and an increase in the cost of seed to the grower.

While we scout the world for potential new varieties there are two major sources of new varietal material. They are the USA and Australia. Varieties from all major cotton growing areas of the USA have been tested. This includes varieties from the Eastern USA, Mid South USA, Missouri, Texas, New Mexico, Arizona and California. Historically, the Deltapine type have performed by far the best in Australia and hence most of our effort in looking for new material is concentrated in this area, although other varieties are checked for suitability.

With our own CSIRO breeding programme in Australia now, we can expect to see more and more good Australian varieties becoming available. I would expect eventually that the Australian varieties will become the most important varieties here as the Australian breeders tailor their varieties for Australian requirements. For instance, in the USA now there is virtually no further breeding for bacterial blight resistance. In the areas where bacterial blight was a significant problem such as Texas they have specifically resistant varieties. However, these varieties do not perform particularly well in Australia. In the remainder of the USA bacterial blight is no longer considered a problem with acid delinted seed. This does not appear the case in Australia. Australian plant breeders are aware of this and bacterial blight resistance is a feature of some new CSIRO varieties.

THE IMMEDIATE FUTURE

As far as a yield performer, the present main variety, Deltapine 61, is a good variety and consequently it must be a good variety that will displace it.

At present there are two potentially promising varieties under development that are likely to replace Deltapine 61.

One of these varieties is Deltapine 90. This is a Deltapine variety with some acala parentage. It appears to be a reasonable yielder in Australia and has a stronger fibre which will make it an attractive variety for the spinners. Cotton Seed Distributors Ltd will be releasing this variety commercially for 1985 planting. While this is a Deltapine type it does exhibit some differences to Deltapine 61. Growers will need to adjust their management to achieve the best performance out of this variety. Deltapine 90, while it is considered marginally shorter in season length to Deltapine 61 in the USA, holds off squaring to a later time than Deltapine 61. Once it commences to square it does so at a phenominal rate. Of course poor crop management during this period would be disasterous as any loss of fruit will result in reduced yield potential. The variety is taller than Deltapine 61 and can exhibit a tendency to go rank with excess nitrogen or squares being stripped off. While the variety can perform well it needs a good management to achieve results. I would draw the analogy between different models of a motor car. If Deltapine 61 is like the FJ Holden, Deltapine 90 is probably akin to a new Commodore. If you expect the Commodore to perform well you have to look after it and treat it a lot better than you treat the old FJ. The same is true of the new high performance varieties. We are all aware of the difficulties some growers experienced in changing from their old model T Fords (Deltapine 16) to the FJ Holdens (Deltapine 61). Once again we are going to have to learn how to handle this new variety to achieve its maximum potential.

While we can reasonably expect a better yield from Deltapine 90 and a better fibre strength, I see no escape from the unstable micronaire that Deltapine varieties have traditionally exhibited in Australia. In very warm seasons the micronaire is likely to be high and in cool seasons the micronaire will be low. While the seed quality of Deltapine 90 is better than Deltapine 61, and we should expect to see some improvement in its crushing qualities and hence a slight improvement in returns for the seed, the seed quality is not so high that care in the selection of seed treatment of the planting seed can be relaxed. Some seed treatments will reduce the vigour of Deltapine 90 planting seed.

The other promising variety is Siokra (formerly N74-367) which is a CSIRO variety. This variety has good colour and yield, a higher strength fibre than Deltapine 61. Normally short season cottons are unable to utilise a

DP 90 available 50% Aust. Cotton area 85/86. Needs protection at squaring.

longer season, however, this variety does have this capability. In a longer growing season it shows a yield advantage of about 5% over Deltapine 61. In a short season, such as last year, the yield advantage is about 20% over Deltapine 61. This characteristic of being capable of handling either a long season or a short season makes the variety exceedingly good for Australia where we experience such variable seasonal conditions compared to overseas cotton growing areas. It is thought that Siokra requires fewer heat units to produce a boll than conventional varieties. The variety is also bacterial blight resistant. Siokra does not have a normal leaf but an ockra leaf and we are examining closely the effect this has on lint grade. In the dry harvest last year there was no difference between the grade of Siokra and Deltapine 61. This may be different in a wet harvest. This variety will be available for commercial release in 1986.

Reduce Boll Rot. Hairy leaf → grade ? Round leaf.

If I look into my crystal ball these two varieties, Deltapine 90 and Siokra, are the most likely varieties to replace Deltapine 61 and it could be within the next couple of years. These varieties appear to overshadow all the existing varieties in Australia and would consequently be expected to replace them. Namcala, with its high quality lint, still stands out. However, its popularity with growers is quite low. It is one of the few varieties in the world to have a fibre strength high enough for use with some of the future spinning techniques. A new selection of Namcala is being tested for yield performance by CSIRO of 8%.

Yield ↑

SHORT SEASON COTTON

There are various reasons for growers to look to short season cottons. Some regions have a short growing season and hence require a short season cotton to achieve reasonable yields. In the USA there is an increasing interest in short season cotton in areas that have a normal season length but are infested with boll weevil. With a short season cotton spray costs can be reduced significantly at the end of the season when the weevil population has increased dramatically. Here in Australia we may have a parallel type need, should we fail to contain heliothis amigera resistance to synthetic pyrethroids.

Other possible uses for short season cotton are replanting after seedling disease, hail destruction or where weather conditions have prevented normal field preparation. With the developing interest in dryland cotton in Australia a shorter season cotton may also be appropriate here as well.

Our exceedingly variable climate in Australia makes the decision of whether to use a short season variety or a full season variety quite complex. Since most short season varities are incapable of utilising a normal length or long season, some yield is sacrificed in these longer growing season years. On the other hand, the full season varieties will perform very poorly in the short seasons. The grower has to weigh up the frequency of short and long seasons, how well his operation can cope with large fluctuations in income from year to year and even the influence the income pattern has on his level of taxation. It is only when all these factors are considered that the real importance of a variety such as Siokra is appreciated. This is a short season variety that can utilise the longer season and hence does not suffer the normal yield loss in a full season condition.

A number of promising short season varieties are under evaluation. From Deltapine there a couple of short season varieties developed for Mississippi. These are Deltapine 50 (or Strain 150) and Deltapine 52 (or Strain 102). Deltapine 50 has been under increase in Australia for two years. It will be in its first yield trials this year and appears the more promising line. The fibre properties appear good with a fibre strength of 90,000 pressley. The variety will need to be checked for season length in Australia as a number of these shorter season varieties from the Mid-South of the USA are not short season in Australia. Under our climate, many of these varieties develop into full season varieties. Deltapine 41 falls into this category.

Also of interest in the short season area is Deltapine 30. In Southern California and Arizona this variety is used for planting after grain. While our season may not be long enough for this variety to excell, it could still be a valuable variety for replanting after seedling disease or hail. This line is still under seed increase and will be in its first trials next season.

Probably the most promising of all short season lines is the CSIRO variety Siokra. This was discussed fully in the previous section.

DRYLAND COTTON

At present there is a lot of interest in dryland cotton. This interest has been generated by the good returns from cotton compared to the returns from other summer crops and the shortages of irrigation water in recent years. The returns from dryland cotton last year have also boosted interest in dryland cotton although growers should be aware that such a favourable rainfall

pattern can be expected probably only once per decade on averages.

For reasons I am unaware, people associate dryland cotton with Texas and hence look for Texas type varieties for dryland cotton in Australia. In actual fact, most of the US cotton crop is grown as dryland cotton so I don't understand this facination with Texas and the exclusion of all other cotton areas as a source of dryland cotton varieties for Australia. Probably the most distinctive feature of the Texas crop of the High Plains and Rolling Plains apart from the quantity of cotton produced is its low yield and low quality. We need to take the blinkers off and look everywhere for the best dryland cotton varieties.

Over the last few years Cotton Seed Distributors Ltd has run dryland cotton trials. This has covered a broad spectrum of seasonal conditions from the hot dry season to the cool wet season last year. Our general conclusions from these trials are that the varieties that perform well under irrigation also perform best in dryland conditions. This is not unusual. In the USA the same varieties are used as either dryland or irrigated varieties in the one district.

HYBRID COTTON

In many areas of agriculture hybrid varieties have increased yields and quality. There has been hope that similar results will occur in cotton. Considerable effort has been put into developing hybrid cotton, yet it appears extremely unlikely that we shall see commercial hybrid cotton before 1990 and it could be most likely much later than this. Many plant breeders feel that conventional cottons will compete favourably with hybrid cottons when they do arrive because of the high cost of hybrid seed production and the steady improvements being continually made in varieties by conventional breeding techniques.

TISSUE CULTURE DEVELOPMENT. FOR VARIETY SCREENING.

CONCLUSION

As growers of Australian cotton you can look forward to an interesting period ahead with new variety development. Of course the price of progress can be high. As the varieties become more specialised they need greater control and management to achieve their full potential. Remember the motor car analogy. The higher the performance, the more care and management the varieties will require from you the grower.