

Some advantages of indeterminate Bollgard II varieties

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All cotton is indeterminate but as we know, some varieties are described as being determinate and others indeterminate. We know them as having a vigorous or a less vigorous growth habit and it is important to note that both types have their place.

Despite the terminology there is only a relatively small range of around seven days difference in maturity between all today's commonly grown Bollgard II varieties.

So what are some of the benefits of the more vigorous indeterminate varieties?

The most significant benefit is their ability to keep growing under adverse conditions. These conditions include high fruit load, waterlogging, moisture stress and any other factor that may cause less vigorous types to want to slow down and even cut-out. The more vigorous indeterminate plant type has the added ability to store more nutrients and carbohydrates in the canopy than the less vigorous plant types.

BALANCING ACT

A key aspect of managing a cotton crop is balancing the source and sink ratio. The source is the carbohydrate production through photosynthesis and the sink is the plant parts that utilise the plant source.

As carbohydrates are allocated to fruit, the rate of node and leaf development will decline and the average leaf age increases. Importantly the leaf canopy will lose two per cent of its weight per day and also two per cent of its ability to produce cellulose for lint production each day — this is why vigour is so important. There is nothing a grower or consultant fears more than a cotton crop cutting out too early when there is season and water still to use.

Nodes above white flower (NAWF) is an easy measure of how the plant is balancing allocation of these resources. The longer the plant can remain at eight NAWF:

- The more nodes it will produce;
- The more nutrient it will store; and,
- The more lint it will produce.

Indeterminate varieties typically exhibit more vegetative growth during early flowering — often resulting in greater leaf area



Vigorous indeterminate varieties have some benefits.

when the early boll load hits. They are easier to maintain at eight NAWF and have a younger, more productive canopy for longer.

Management of excessive growth can be done using mepiquat chloride as this is the cheapest form of growth management other than boll load. The use of the Benchmark program can help with this management and prescribe the correct amount of mepiquat chloride for the desired height and level of growth.

Managing growth and maintaining a good boll load is important. The balance of having enough source (fuel in the tank) for the sink (boll load) is critical to the final potential of the crop.

ACCUMULATING NUTRIENTS

Nutrient accumulation early in the plant life is critical as demands by the plant in times of rapid fruit development far outstrip the ability of the plant to take nutrients from the soil. Nutrient accumulation initially occurs primarily in the leaf and shoot tissue and nitrogen and potassium is then mobilised when boll development begins.

Nitrogen is accumulated in the seed and potassium in the boll walls. Indeterminate type varieties with more and fresher leaf area to temporarily store nutrients are more easily able to meet this high nutrient demand.

It has been some time since premature senescence has been a major problem throughout the industry. Gains have been made in the way growers are feeding crops as well as gains from improved vari-

eties. But it has also been a long time since the industry has seen prolonged wet conditions at peak boll fill, and this is when the more indeterminate varieties will come into their own.

The more vigorous indeterminate plant types have an important role to play. They can sustain vegetative growth during early fruit set, provide increased leaf area as a source of carbohydrates and nutrients and are easier to maintain at eight NAWF — thus increasing the number of nodes set and the potential lint produced. 