Cotton Catchment Communities CRC
Queensland Government

COTTON *TALES*

Central Queensland

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2010/11
No.6
02/12/10

Day Degree Accumulation

District		Season 10/11	Season 09/10	Average	Hot Shock	Cold Shock
Emerald	From 05/10/10	646	794	778	0	2
Emerald	From 15/11/09	191	287	247	0	0
Theodore	From 02/10/10	615	792	721	0	4
Theodore	From 12/11/09	223	321	261	0	0

Crop Stages versus Day Degree Accumulation.

Emerg.	5th leaf	1st Sq	1st Flow	Peak Flow	Cracked Boll	60% open
80	330	505	777	1302	1527	2050

Rainy day implications

How will the plant respond in cloudy weather?

Generally plant growth, particularly emergence, was slower than is typically expected in CQ due to the low temperatures, leading to some establishment issues. The unusual conditions have also changed the look of the plant, with plants producing bigger leaves in response to the generally low radiation. Root development can also be affected, as root systems do not need to seek out moisture at depth.

The low radiation has also led to some shedding of squares, as plants cannot produce the food (energy) to support them. Plants will compensate for shed squares when sunny conditions return. It is important to ensure the plants have sufficient nutrition and water at this time to compensate & that Pix is not over used as it can suppress the production of new fruiting sites. It is best to assume that if early squares are shed a good yield will only be achieved on a taller plant because new nodes are required to replace lost squares.

WATER LOGGING

Waterlogging will generate additional physiological responses to those that are simply experiencing sustained warm, cloudy conditions, and in wet soil. Water logging is accentuated by rainfall after irrigation, cloudy conditions, and inadequate land preparation. Symptoms of waterlogged cotton include a general yellowing of the crop and stunted growth.

The major and immediate effect of waterlogging is blocking transfer of oxygen between the roots and the soil atmosphere. Plant roots may become so oxygen deficient that they cannot respire. As a consequence, root growth and absorption of nutrients is decreased leading to less overall plant growth. Waterlogging can increase sodium uptake which may then affect the uptake of other nutrients and the growth of the plant.

In addition to the physiological impacts of waterlogging on the crop there are also significant impacts on nutrient availability and uptake. The availability of Nitrogen (N), Iron (Fe) and Zinc (Zn) (reduced) and Manganese (Mn) (increased) are directly affected by the decline in soil oxygen, and uptake of N, K and Fe by the roots is also impaired.

NITROGEN

Denitrification of soil mineral N, may result in less N being available to crop even after water logging has ceased. Foliar N is more effective in increasing the yields of waterlogged cotton when applied one day before irrigation under hot, sunny conditions. Application to a field that is water logged will not necessarily alleviate existing damage. Growers may be tempted to apply more N fertiliser to replace what may have been lost – leaf testing will indicate if this is necessary.

Recovery from waterlogging and fruit shedding is easier to manage on younger crops. Crops suffering from a combination of early shedding and reduced N uptake can cut-out prematurely that is the flower will reach the top of the plant with very few bolls set. Adding N in this situation can cause a second flowering & significantly delay maturity.

PHOSPHORUS AND POTASSIUM

Waterlogging is possibly involved in premature senescence of cotton. Under waterlogged conditions, uptake of P and K by the cotton crop may be reduced, predisposing the crop to the premature senescence syndrome.

IRON

The young leaves of iron deficient plants become yellow between the veins (chlorosis). The veins usually remain green, unless the deficiency is severe and the whole leaf may

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eventually turn white. Although the plant may contain high concentrations of iron, most of it is unavailable for chlorophyll production and the leaves lose their green colour. Foliar application of 200 g Fe/ha with a ferrous sulphate may return foliage to its normal colour within 2-3 days.

NUTRITION MONITORING & APPLICATION

Petiole testing is not an option during cloudy, inclement weather. However, leaf tissue testing is the better option when weather conditions improve, to identify which nutrients may be lacking. Nutrilogic can help interpret results. (http://cottassist.cottoncrc.org.au)

Foliar fertiliser formulations that include N, P, Fe and Zn will probably be the most helpful, but best to wait until the sun shines.

IRRIGATION MANAGEMENT

As the plant, and in particular the root system has developed during a very wet period, when the weather warms up and soils dry out, irrigation scheduling will need to be responsive to the potential smaller root system, with shorter and more regular irrigations, particularly during periods of heat. Use of probes for scheduling as well as responding to signs of stress in the plant is needed.

VEGETATIVE GROWTH MANAGEMENT

Due to the indeterminate nature of the cotton plant the vegetative and reproductive growth occur in parallel and it is important to keep the reproductive and vegetative growth in balance, particularly in a Central Queensland climate. Crops that are too tall and rank are difficult to manage and pick and will not yield at potential, however short determinate crops may be limited in yield potential and can struggle to compensate if fruit loss occurs during future cloudy periods.

It is important to closely monitoring vegetative growth rate (VGR), fruit retention & boll size. If excessive vegetative growth is detected, the use of mepiquat choride (PIX®) should be considered. Growth regulator applications combined with moisture stress can result in yield reductions. Multiple small doses of Pix are usually better in these situations.

Thanks to Stephen Yeates, Michael Bange & Ian Rochestor for their assistance with this article.

WET DAY ACTIVITIES?

This might be a good time to:

- Ensure your cotton has been registered on www.cottonmap.com.au
- Do a module in myBMP www.mybmp.com.au
- Check out all the new tools and publications on CRC website: http://web.cotton.crc.org.au/content/Industry/CRC_home.aspx
- Do up a storm management plan – so everyone else will know what to do if it rains (more) while you are not on the farm.
- Go & have a coffee with your neighbours, spray contractor &/or consultant and get your PAMPs updated while you are there.

PUMPS WORKSHOP - EMERALD

Considering a new pumping station? Has "old reliable' actually became very weary and grossly inefficient? Pumps operating outside their comfort zones (i.e. efficiency curves) may affect the entire irrigation system, reducing irrigation efficiency and productivity costing thousands per year in excess fuel costs.

This workshop explains

- pump types
- pump duty
- pump curves
- pump efficiency and energy use
- pump selection

When: Wednesday 8 Dec 9:00 AM–12:00 AM
Location: DEEDI Conference room

(opp Emerald racecourse)

Those interested in attending the Pumps workshop should contact Lance asap

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For growers in other areas, please contact Lance if interested in having a workshop in your area. Workshops available include, scheduling, pumps, probes, & overhead systems.