

# Cotton growth regulators and defoliants

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## Growth regulators

Excessive vegetative growth is a problem because it reduces the retention of fruit and delays maturity and results in reduced efficacy of insecticides due to poor penetration of the canopy. To determine if growth regulators are required see Cotton Seed Distributors' website ([www.csd.net.au](http://www.csd.net.au)) to calculate vegetative growth rates. For more information refer to 2013 *Cotton Production Manual*. Cottassist provides support in calculating vegetative growth rates.

## Defoliation

The safe timing of defoliation is when the youngest boll expected to reach harvest is physiologically mature. This usually occurs when 60–65% of bolls are open. The other method of assessing physiological maturity is when there are 3–4 nodes of first position bolls above the highest cracked first position boll (last harvestable boll), known as nodes above cracked boll (NACB). For more information on defoliation see FibrePak and 2013 *Cotton Production Manual*.

Registration of a chemical is not a recommendation for the use of a specific chemical in a particular situation. Growers must satisfy themselves that the chemical they choose is the best one for the crop and situation.

Growers and users must also carefully study the container label before using any chemical, so that specific instructions relating to the rate, timing, application and safety are noted. This

publication is presented as a guide to assist growers in planning their agronomy programs.

**If there is any omission from the list of chemicals, please notify the authors.**

## IMPORTANT— avoid spray drift

Take every precaution to minimise the risk of causing or suffering spray drift damage by:

- Planning your crop layout to avoid sensitive areas, including homes, school bus stops, waterways, grazing land and non-target crops.
- Ensuring that all spray contractors have details of any sensitive areas near spray targets.
- Consulting with neighbours to minimise risks from spraying near property boundaries. Keep neighbours informed of your spraying intentions near property boundaries. Make it clear that you expect the same courtesy from them.
- Carefully following all label directions.
- Paying particular attention to wind speed and direction, air temperature and time of day before applying pesticides using buffer zones as a mechanism to reduce the impact of spray drift or overspray.
- Keeping records of chemical use and weather conditions at the time of spraying.

### ABBREVIATIONS USED IN TABLES 37–40

AC = Aqueous concentrate	SC = Suspension concentrate
L = Liquid	WDG = Water dispersible granule
LC = Liquid concentrate	

**TABLE 37: Plant growth regulators**

Active ingredient	Concentration and formulation	Application rate of product	Comments
Mepiquat	38 g/L AC	0.25–0.6 L/ha	Pre flowering rate. Post flowering rate. Apply no more than 1.5 L/ha in total. See label for application times.
		0.25–1.0 L/ha	
		0.75–2.0 L/ha	Single application rate. Use high rate where crop growth is excessive, between 1st flower and cut out. Check label.

**TABLE 38: Plant growth regulators trade names and marketers**

Active ingredient	Concentration and formulation	Trade name	Marketed by
Mepiquat	38 G/L Ac	Fix 38	Chemtura
		Adjust 38	Rotam
		Chemquat	Imtrade
		Concorde	Nufarm
		Cot-Trol 38	Hextar
		Fortune	Syngenta
		Mepi-C	Miller
		Mepidef	Farmalinx
		Mepiquat 38 Plant Growth Regulator	Ozcrop, Shandong Rainbow, Agri West, Pacific Agriscience, Accensi, Titan Ag, Landmark Operations, Ospray, Kenso, Conquest, Echem
		Piqme 38	United Phosphorus
		Pix	Nufarm
		Reign	Bayer Cropscience
		Reward	Farmoz

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## **Defoliation Products**

Ethephon  
Thidiazuron 500 SC  
Thi-Ultra SC  
Mepiquat 38

## **Insecticides**

Diafenthiuron 500  
Abamectin  
Alpha-Cyp 100 Duo  
Amitraz 200 EC/ULV

## **Cotton Seed Treatment Insecticides**

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**TABLE 39: Cotton defoliation products**

Active ingredient	Concentration and formulation	Application rate of product	Comments
Carfentrazone-ethyl	240 g/L EC	0.08 – 0.1L/ha	Desiccate regrowth following defoliation. Do not harvest for 1 day and do not graze or feed cotton trash to livestock.
Cotton seed oil	860 g/L LQ	2 L/ha	Apply in combination with thidiazuron as specified on the label.
Diquat	200 g/L AC	2.0–3.0 L/ha	See critical comments on label. May damage green bolls.
Ethephon	720 g/L AC	0.5–1.0L/ha 1.3L/ha 2.0-3.0L/ha	Accelerated boll opening in combination with a defoliant Pre conditioning Acceleration of boll opening
Ethephon + AMADS	275 g/L + 873 g/L AC	0.5–1.0 L/ha 3-4 L/ha 4 L/ha	Defoliation and accelerated boll opening. Boll opening and supplementary defoliation. Boll opening.
Ethephon + Cyclanilide	720 g/L + 90 g/L LC	1.3 - 2.5 L/ha 1.3L 0.33 – 0.67 L/ha	Acceleration of boll opening and enhancement of defoliation. Pre conditioning. Enhancement of defoliation
Paraffinic oil	582 g/L LQ 598 g/L EC 653 g/L EC 792 g/L EC 815 g/L EC 830 g/L EC	0.5–1.0 L/100 L water 0.5 L/ha 0.5 L/ha 0.5 L/ha 2 L/100 L 2 L/100 L	Compatible with thidiazuron and ethephon. Apply in combination with defoliant such as Dropp and Prep. Apply in combination with defoliant such as Drop and Prep Apply with Dropp Ultra or DroppWP in accordance with their labels. Apply in combination with thidiazuron defoliant. Apply in combination with thidiazuron defoliant.
Paraquat + diquat	135 g/L + 115 g/L AC	1.2–1.6 L/ha	Apply to dryland and moisture stressed cotton. Can damage immature green bolls.
Petroleum oil	827 g/L LQ 844 g/L EC 846 g/L EC 859 g/L LQ 861 g/L	2 L/ha 2 L/ha 2 L/ha 2 L/ha 2 L/ha	Apply in combination with thidiazuron as specified on the label. Apply with Dropp defoliant Apply with Dropp Ultra. Apply in combination with Dropp defoliant as specified on the label. Apply with Dropp Ultra in accordance with the Drop Ultra label.
Pyraflufen-ethyl + n-methyl-2-pyrrolidone	25 g/L + 102 g/L EC	0.04–0.08L/ha	Always apply as a tank mixture with ethephon (1–2 L/ha) and D-C-Tron (2 L/ha). Apply when the last harvestable boll is physiologically mature.
Sodium chlorate	300 g/L	11.0–22.0 L/ha	Apply 2–3 weeks before anticipated picking dates. Apply when temperatures are high and soil moisture moderate.
Thidiazuron	490 g/kgWG or 500 g/L SL	0.05–0.1 kg/ha 0.1–0.15 L/ha 0.15–0.2 L/ha	Ideal conditions. Good conditions. Average conditions. Do not apply under cold conditions.
Thidiazuron + Diuron	120 g/L + 60 g/L SL	0.15–0.2 L/ha 0.2–0.25 L/ha 0.25–0.3 L/ha 0.3–0.4 L/ha	Ideal conditions. Good conditions. Average conditions. Cold conditions.
	240g/L + 120g/L SL	0.075–0.1 L/ha 0.1–0.125 L/ha 1.25–1.5 L/ha 1.5-2 L/ha	Ideal Good Average Cold Conditions.

**TABLE 40: Defoliation products trade names and marketers**

Defoliant	Concentration and formulation	Trade name	Marketed by
Cotton seed oil	860 g/L LQ	Intac Cotton Spray Oil	Nipro
Diquat	200 g/L AC	Desi-Tex 200 Dia-Kill 200 Diquat 200	Ronic International Sinon Accensi, Farmalinx, Imtrade, Kd Plant Care, Kenso, Landmark Operations, Ospray, Ozcrop, Shandong Rainbow, Titan Ag
		Hydrogel D Reglone Sanction 200	Better Safe Syngenta Australia Conquest Crop Protection
Ethephon	720 g/L AC, SC, EC	Advancer 720 Boll Cracker 720	Redchem Australis Crop Protection

**TABLE 40: Defoliation products trade names and marketers (continued)**

Defoliant	Concentration and formulation	Trade name	Marketed by	
Ethephon	720 g/L AC, SC, EC	Ethephon 720	Proterra, Novaguard, Pacific Agriscience, Accensi, Ospray, Landmark Operations, Conquest Crop Protection, Kenso, Echem, Apparent, Ezcrop, 4 Farmers, Agro-Alliance, Ozcrop, Shandong Rainbow, Agri West, Titan Ag, Imtrade	
		Ethon 720	Farmalinx	
		Galleon	Nufarm Australia	
		Prep 720	Bayer Cropscience	
		Promote 720	Farmoz	
		Sentral 720	Hextar Chemicals	
Ethephon + AMADS	275 g/L + 873 g/L AC	CottonQuik	Nufarm	
Ethephon + Cyclanilide	720 g/L + 90 g/L LC	Finish 720	Bayer CropScience	
Adjuvants	582 g/L LQ	Paraffinic Oil	Apparent	
		AC Para Spray Oil	AxiChem	
		Infuse	Rygel	
		Penatrol	Alphachem	
		Pro Stickup	5 heads	
		Smartup	Crop Smart	
	598 g/L EC	Uptake Spraying	Dow AgroSciences	
		Oil Enhance Spray Adjuvant	Sacoa	
		PowerSurge Spray Adjuvant	Conquest	
		Sticka Sprayoil	ACP	
		792 g/L SC	Canopy Insecticide	Caltex Australia
		815 g/L EC	Biopest Paraffin Oil	Sacoa
815 g/L EC	815 g/L EC	Bioclear	Caltex	
	830 g/L EC	Trump	Victorian Chemicals	
	135 g/L + 115 g/L AV	Refer to Table 33	Refer to Table 33	
	Petroleum oil	827 g/L L	D-C-Tron	Caltex
		844 g/L EC	Sacoa Summer	Sacoa
		846 g/L EC	Broadcoat	Caltex
859 g/L L		Cottoil	Sacoa	
861 g/L		Empower	Innovative Chemical Services	
Pyraflufen-ethyl + n-methyl-2-pyrrolidone	25 g/L + 102 g/L EC	ETee	Sipcam Pacific	
Sodium chlorate	300 g/L L	Total Ag Leafex	Total Ag	
Thidiazuron	490g/kg WP 500 g/L SC	Lanceadrop	Lances Link	
		Dropp Liquid	Bayer Cropscience	
		EScalate 500 SC	Farmoz	
		Mace 500 SC	Conquest Crop Protection	
		Reveal Liquid	Nufarm Australia	
		Tentacle SC	Agri West	
Thidiazuron	500 g/L SC	Thidiazuron 500DC	Accensi, Apparent, Echem, Kenso, Landmark Operations, Ospray, Proterra, Sabakem, Titan Ag	
		Thiron	Farmalinx	
		Timezone 500	Australis Crop Protection	
Thidiazuron + diuron	120 g/L + 60 g/L SC	Do Away	Ospray	
		Escalate Ultra	Farmoz	
		Thidiazuron + diuron	Titan AG	
		Thi-Ultra	eChem	
		Dropp UltraMAX	Bayer CropScience	
	120 g/L + 60 g/L SC	Do Away	Ospray	
	120 g/L + 60 g/L SC	Escalate Ultra	Farmoz	
	120 g/L + 60 g/L SC	Thidiazuron + diuron	Titan AG	
	120 g/L + 60 g/L SC	Thi-Ultra	eChem	
	240 g/L + 120 g/L SC	Dropp ultramax	Bayer CropScience	