



**Government of India**  
**Ministry of Agriculture & Farmers Welfare**  
**Department of Agriculture, Cooperation & Farmers Welfare**  
**Directorate of Plant Protection, Quarantine & Storage**  
**Central Insecticides Board & Registration Committee**  
**N.H.-IV, Faridabad-121 001**

# **Major Uses of Pesticides**

**(Registered under the Insecticides Act, 1968)**

**(UPTO - 30/06/2020)**

**(Based on certificate issued)**

***Disclaimer: The document has been compiled on the basis of available information for guidance and not for legal purposes.***

## **PLANT GROWTH REGULATORS (PGR)**

**Plant Growth Regulators (PGR): (Page No. 2 to 13)**

## APPROVED USES OF REGISTERED PGR

### PLANT GROWTH REGULATORS (PGR)

Name of PGR & approved Crops	Time of application / purpose	Dosage /ha		Dilution In Water (Litres) / Preparation of solution	Waiting period / PHI between last application & harvest (days)
		a.i. (ppm/gm/%)	Formu-lation (ml/gm/L tr/kg/%)		
Alpha Naphthyl Acetic Acid 4.5% SL ( Na salt)					
Tomato	At the time of flowering two spray.	45ppm	-	-	-
Chillies	1 <sup>st</sup> spray during flowering & 2 <sup>nd</sup> spray 20 -30 days later.	10ppm	-	-	-
Mango	Ist spray when tender fruits one of pea size. 2 <sup>nd</sup> spray when fruits one of marble size( about 2 cm diameter)	20ppm	-	2 ml in 4.5litre.	-
	<u>To control Mango malformulation-</u> Before fruit bud differentiations approx.3 months before flowering	200ppm	-	20 ml in 4.5 ltrs.	-

Grapes	(a)To increase size & weight of berries. – 1 <sup>st</sup> sprays at pruning time. – 2 <sup>nd</sup> spray when flowering shoot appear	10ppm	-	2 ml in 49 ltrs.	-
	(b)To control berry drop (spray on matured grape bunches) 10-15 days before harvesting.	100ppm	-	20 ml. in 49 ltrs.	-
Pineapple	<b>(a)</b> <u>To induce flowering and uniform growth</u>	10ppm (In dry weather half strength solution i.e. 5 ppm may be used)	-	1 ml in 4.5 ltrs (pour 30-50 ml of solution in to the head of each plant)	-
	(b)To increase fruit size.	199ppm	-	10 ml in 4.5 ltrs. (spray to wet the whole plant) 10 ml in 4.5 ltrs.(Wet the whole fruit 2 weeks before harvest.)	-
	I To delay maturity - Two weeks before harvest.	100ppm	-		-
Cotton	To prevent shedding of flower squares & bolls (3 sprays at 15 days interval from square formation stage	10-20 ppm.	222-444 ml	1000 ltr.	
<b>Chlormequat Chloride 50% SL</b>					
Cotton (American)	Square formation of early flowering (one spray)	20-40 gm a.i/ha	40-80 ml/ha	High Volume 375-600 Low volume 125-187	-
Cotton (Deshi)	Square formation of early flowering (one spray)	75 a.i. gm/ha	150 ml/ha	High volume 375-600	-

Brinjal	Seed soaking for 24 hours (before sowing)	50ppm	100ppm	1ml/ 10L water	-
Potato	Dipping of cut pieces for 10 minutes	100ppm	200ppm	2.0ml/ 10 L water	
Grapes 1 <sup>st</sup> spray:  2 <sup>nd</sup> Spray:  3 <sup>rd</sup> Spray:	3-5 leaf stage after April pruning  5-7 leaf stage after April Pruning  3-5 leaf stage after October Pruning	500 g a.i./ha   1000 g a.i./ha  250 g a.i./ha	1000ml   2000 ml   500ml	   1000L	   91
<b>Chlorpropham 50% HN</b>					
Potato	Antisprouting agent for stocked potatoes under cold storage condition Temp= 10±2°C R.H.= 90±5%	18-20 gm/MT	36-40 ml/MT	Formulati on is to be applied as such with fogging applicator	20
<b>Ethephon 10% Paste</b>					
Rubber	For renewed bark 4 times bark swabbing. During March, August, September & November below the tapping panel after 4cm scrap of the bark /above the tapping panel/on the tapping cut after removing the lace.	10%	50 ml. formulatio n per tree directly used without dilution.	-	-
<b>Ethephon 39 % SL</b>					
Mango	a)For breaking alternate bearing tendencies	200 ppm	770-1025	1500-2000	26 ml in 10 lit of water
	b)For Flower induction in juvenile mango	1000 ppm	3846- 5128	1500-2000	5ml in 10 lit of water
	c)Post-harvest treatment (For Uniform Ripening)	500 ppm	1923- 2564	1500-2000	26 ml in 10 lit of water

Pine apple	For flower induction	100 ppm	385-513	1500-2000	13 ml in 10 lit of water
Coffee (Arabica)	For uniform ripening of berries, One spray at fly pricking stage, when 10-15% berries are ripened.	192 ppm	738-985	1500-2000	5 ml in 10 lit of water
Coffee (Robusta)	For uniform ripening of berries, one spray at fly pricking stage, when 10-15% berries are ripened.	96 ppm	215-287	1500-2000	2.5 ml in 10 lit of water
Tomato	Post-harvest treatment (for Uniform Ripening)	2500 ppm	-	-	65 ml in 10 lit of water
Rubber	Yielding rubber latex	1000 ppm	0	1500-2000	2.5 ml in 10 lit of water
Pomegranate	Defoliation for better flowering and fruit yield	390-48.5 gm	1000-1250 ml	500	135 days (2-2.5 ml/lit water)
<b>Forchlorfenuron 0.1% L (w/v)</b>					
Grapes	Two dipping applications. 1 <sup>st</sup> When size of berry is 3-4 mm diameter and 2 <sup>nd</sup> When size of berry is 6-7 mm diameter,	2ppm.	1 ltrs.	500	60 days
<b>Forchlorfenuron 0.12% EC w/w</b>					
Grapes	To enhance the fruit size in seedless grapes single directed spray on berries at 4-6 mm berry size	3 ppm	1.5 liter	500 liter/ha.	20
<b>Gibberellic Acid Technical (90% w/w)</b>					
Grape fruit	a) At full bloom (for fruit set )- single spray b) 1 <sup>st</sup> week of May (For June fruit drop) –single spray c) 1 <sup>st</sup> week of October (For pre-harvest drop)-single spray	500-1000 ppm	-	-	-
Sweet cherry	When more than 60% buds opened fully.	40-80ppm	-	-	-

Grapes	Two directed spray I <sup>st</sup> at full bloom & 2 <sup>nd</sup> at fruit set stages.	100ppm.	-	-	-
Grape (Seedless)	Two blanket spray at I <sup>st</sup> full bloom & 2 <sup>nd</sup> at post bloom stage.	15-60ppm	-	-	-
Brinjal	a) seed treatment (dipping)	10ppm	-	-	-
	b) When 4 weeks old -weekly spray	50ppm	-	-	-
<b>Gibberellic Acid 0.001%L</b>					
Paddy	To increase the yield and quality of the crop produce				
	Short duration varieties 20-25DAT Medium duration varieties 30-35 DAT Long duration varieties 40-45 DAT	0.018gm	180 ml	450-500	-
Sugarcane (Planted crops)	a)First spray 40-45 DAP b)Second spray 70-80 DAS	0.018gm	180 ml	450-500	-
Cotton	a) First spray 40-45 DAP b) Second spray: At the time of ball formation	0.018gm	180 ml	450-500	-
Groundnut	a) First spray at flowering (30-35 AS) b) Second spray at the time of flowering	0.018gm	180 ml	450-500	-
Banana	a) First spray 3 <sup>rd</sup> month b) Second spray 5 <sup>th</sup> month Third spray at the time of fruit formation	0.027gm	270 ml.	450-500	-

Tomato / Potato / Cabbage / Cauliflower	a) First spray 45 DAS b) Second spray 65 DAS	0.018gm	180 ml.	450-500	-
Grapes	a) First spray 30-35 days after pruning b) Second during the match head stage	0.018gm	180 ml.	450-500	-
Brinjal, Bhindi	a)First spray 34 DAP b)Second spray 70 DAP c)Third spray 105 DAP	0.045 gm	450 ml.	450-500	-
Tea	Five spray at monthly interval.	-	270ml	450-500	-
Mulberry	First spray: 15-20 days after harvest	0.045	450	450-500	
<b>Gibberellic Acid 0.186% SP</b>					
Cotton	to improve fiber quality one spray at square formation or early flowering stage	142ppm.	71 gm	450-500	-
<b>Gibberellic Acid 40% WSG</b>					
Grape	Pre Bloom- Elongation	40	50	500	
	Fruit Setting Thinning				
	6-7mm berry size-enlargement				
Rice	20-25 Days After Transplanting	20-25	20-62.5	500	
	At Panicle emergence	20-25	50-62.5	500	
<b>Hydrogen Cyanamide 50% SL (Import)</b>					
Grapes	For breaking bud dormancy Single application as spray Just after pruning ,	1-1.5%	2-3%	375-500	90-120 days
<b>Hydrogen Cyanamide 50% SL (Indigenous manufacture)</b>					

Grapes	For breaking dormancy of fruiting buds Just after pruning, single application by swabbing.	1.5%	1.5 ltrs.	Mix with 200-300 ml. of product in 10 litres of water.	120 days
<b>Hydrogen Cyanamide 49% AS ( Import )</b>					
Grapes	For breaking bud dormancy One directed spray, just after pruning.	1.0-1.5%	2-3%	50 ltrs.	110 days
Sugarcane	Dipping of setts	0.50	1.00%	Mix 1000 ml of the product per 100 litres of water	319 days
<b>Mepiquat chloride 5% AS</b>					
Potato	One spray 45 DAP To restrict the excessive vegetative growth of potato and increasing its yield	62.5-75gm	1.25-1.5Ltr	Mix 200 - 300 ml of products in 10 ltrs of water.	60-90 days
Cotton	single spray at flowering stage to Control of excessive vegetative growth and to increase crop yield in cotton	50-62.5 gm	1.0-1.25 ltr	500-600	57
<b>1-Methylcyclopropene 3.3% VP (Vapour Releasing Product)</b>					
Apple fruit (Under ambient and cold condition)	Applied as soon as possible after harvest, within a maximum of 7 days after harvest on fruits kept at ambient and cold temperature away from source of external ethylene.	2.24 mg	68 mg (1000 PPB)	-	1
<b>Paclobutrazol 23% SC (W/W) / (25% W/V)</b> <b>(Import Source:- ZENECA Agrochemicals, Fernhurst, Haslemere, Surrey, UK)</b>					
Mango	To reduce the inter node length of new shoots and earlier			Recommended	



	<p>formation of terminal bud. Favourably, influence the fruit bud production, fruit colour and harvest yield</p> <p>7-15yrs old</p> <p>16-25 yrs.old</p> <p>&gt;25 yrs old</p> <p>Application after the harvest of fruits (Any time from July to Oct)</p>	-	15 ml. Per tree	quantity diluted in clean water of 5-10 lit. and applied in furrow 5 to 10 cm deep about 30 cm away from the trunk. Fill up with soil after application or apply as soil – collar drench.	-
		-	20 ml. Per tree.		
		-	25-40 ml. Per tree		
			(Note: If the soil is sandy the rate of application may be reduced to 75 % of the recommended. For repeat use the rate of application can be 50 to 75 % of the rate used in the 1 <sup>st</sup> year)		

**Paclobutrazol 23% SC (W/W) / (25% W/V)**

**(Import Source:- PGR International Pty. Ltd., 4 Dairy road, Werribee Vic. 3030 Australia)**

Mango	<p>To reduce the inter node length of new shoots and earlier formation of terminal bud. increase fruit bud production, and improve fruit yield texture</p> <p>16-25 yrs old</p> <p>Application after the harvest of</p>	4.0 gm per tree	16 ml. Per tree	Make a round furrow about 5 to 10 cms deep at least 30cm away from the trunk. Mix the	Waiting Period-NIL as the chemical is applied 8 months before
		-	(Note: If the soil is sandy the rate of		

	fruits (Any time from July to Oct)	-	application be reduced to 75 % of the recommended. For repeat use the rate of application can be 50 to 75 % of the rate used in 1 <sup>st</sup> year)	recommended dose with about 5-10 litres of clean water and apply to the furrow. Fill up with soil after application and irrigate once or twice a month subsequently	harvest of fruits
<b>Paclobutrazol 23% SC (W/W) / (25% W/V) (Indigenous manufacture)</b>					
Mango	<p>To reduce the inter node length of new shoots and earlier formation of terminal bud. Favourably, influence the fruit bud production, fruit colour and harvest yield</p> <p>7-15 yrs old</p> <p>16-25 yrs old</p> <p>&gt;25 yrs old</p> <p>Application after the harvest of fruits (Any time from July to Oct)</p>	-	<p>15 ml. Per tree</p> <p>20 ml. Per tree.</p> <p>30 ml. Per tree</p> <p>(Note: If the soil is sandy the rate of application may be reduced to 75 % of the recommended. For repeat use the rate of application can be 50 to 75 % of the rate</p>	<p>Recommended quantity diluted in clean water of 5 lit. and applied in furrow 5 to 10 cm deep about 30 cm away from the trunk. Fill up with soil after application or apply as soil –collar drench.</p>	-

			used in the 1 <sup>st</sup> year)		
<b>Paclobutrazole 40% SC</b>					
Pigeon Pea	At Flowering initiation stage	30	75	500	48
<b>Prohexadione-Ca 10% WG</b>					
Apple	Two split applications: 1 <sup>st</sup> application: at 3-5 leaves/ shoot 2 <sup>nd</sup> application 4 weeks after 1 <sup>st</sup> application	125  150	50 gm per 100 liter 60 gm per 100 liter	2500  2500	94
<b>Sodium Para –Nitrophenolate 0.3% SL</b>					
Cotton	Flower bud initiated stage and fruit set stage	0.5%	5ml	800	16
Tomato	Flowering and fruit stages	0.5%	4ml	200	7
<b>Triaccontanol 0.05% EC</b>					
Cotton	To increase the yield  Three sprays at 45, 65 and 85 days after planting	0.125 gm	0.25ltr	400-500	
Rice	Three sprays at 25, 45 and 65 days after transplanting	0.125 gm	0.25ltr	400-500	
Chilli	Three sprays at 25, 45 and 65 days after planting	0.125 gm	0.25ltr	400-500	
Tomato	Three sprays at 25, 45 and 65 days after planting	0.125gm	0.25 ltr	400-500	
Groundnut	Three sprays at 25, 45 and 65 days after planting	0.125 gm	0.25 ltr	400-500	-
Potato	Two sprays at 30 and 45 days after planting	0.250 gm	0.50 ltr	500-600	-

<b>Triaccontanol 0.05%w/w min. GR</b>					
Cotton	To increase the yield  Broadcast & mix the desired quantity of granules in soil 2-3 days before sowing.	12.5 gm	25 kg.	-	-
Rice	Broadcast & mix the desired quantity of granules in soil 2-3 days before transplanting.	12.5 gm	25 kg.	-	-
Chilli	Broadcast & mix the desired quantity of granules in soil 2-3 days before sowing.	12.5 gm	25 kg.	-	-
Tomato	Broadcast & mix the desired quantity of granules in soil 2-3 days before sowing.	12.5 gm	25 kg.	-	-
Groundnut	Broadcast & mix the desired quantity of granules in soil 2-3 days before sowing.	12.5 gm	25 kg.	-	-
<b>Triaccontanol 0.1% EW</b>					
Cotton	To increase the yield  Three sprays at 45, 65 and 85 days after planting	0.25 gm	0.25 ltr.	400-500	-
Rice	Three sprays at 25, 45 and 65 days after transplanting	0.25 gm	0.25 ltr.	400-500	-
Chilli	Three sprays at 25, 45 and 65 days after planting	0.25 gm	0.25 Ltr.	400-500	-
Tomato	Three sprays at 25, 45 and 65 days after planting	0.25 gm	0.25 ltr.	400-500	-
Groundnut	Three sprays at 25, 45 and 65 days after planting	0.25gm	0.25 ltr.	400-500	-
<b>Cyclanilide 2.10% w/w +Mepiquat Chloride 8.40% w/w SC</b>					

Cotton	First spray should be applied at square formation stage or after 45-55 days of sowing. 2 <sup>nd</sup> and 3 <sup>rd</sup> spray should be applied at an interval of 15 days.	4.40 +17.60 to 4.95 +19.80 gm	200 - 225	500	21
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