



حکومت جموں و کشمیر  
محکمہ ہارٹیکلچر کشمیر  
Directorate of Horticulture Kashmir



**Plant Protection Schedule for the Management of  
Insect Pest and Diseases of Apple (2021)**

# Plant Protection Schedule for the Management of Insects, Pests and Diseases of Apple (2021)

Spray	Phenological stage	Insecticides/Acaricides/ Oils per 100 litres of water	Fungicide /100 lit of water(2021)
I	Delayed Dormancy <sup>1</sup>	Horticultural Mineral Oil (HMO 2 Lit.)	X
II	Green Tip	X	Mancozeb 75 WP (300 g) or Captan 50 WP <sup>1</sup> (300 g) or Propineb 70 WP (300 g) or Zineb 75 WP (300 g) or
III	Pink bud	<b>Need Based for Insects:</b> a) If HMO spray is missed: Dimethoate 30 EC (100 ml) b) For Blossom Thrips: Apply when 2 or more thrips per flower are observed Thiacloprid 21.7 SC (40 ml)	<b>10-14 days after II spray</b> Zineb (68%) + Hexaconazole (5%) 100g or Dodine 65 WP 60g or Dodine 40 SC 90 ml or Fluxapyroxad 250g/l+ Pyraclostrobin 250g/l 500 SC @ 20ml
IV	Petal fall	<b>Need Based for Insects:</b> Dimethoate 30 EC (100 ml) or Quinalphos 25 EC (100 ml) <b>Need Based for Mites:</b> Apply acaricide when 4-5 mites per leaf are observed Hexythiazox 5.45 EC (40 ml) or Spiromesifen 22.9 SC (40 ml) or Fenazaquin 10 EC (40 ml) or <b>Cyenoxyrafen 30 SC (30 ml)</b>	<b>When 60-70 % petal fall occurs</b> Difenaconazole 25EC (30ml) or Flusilazole 40EC (20ml) or Trifloxystrobin (25%) +Tebuconazole (50%) 75 WG (40g)
V	Fruit let (Pea size)	<b>For Insects:</b> Chlorpyrifos 20 EC (100 ml) or Dimethoate 30 EC (100 ml) <b>Need Based for Mites:</b> Apply acaricide when more than 5 mites per leaf are observed Hexythiazox 5.45 EC (40 ml) or Spiromesifen 22.9 SC (40 ml)	<b>10-14 days after IV spray</b> Zineb (68%) + Hexaconazole (4%) 72WP (100g) or Dodine 65 WP (60g) or Dodine 40 SC (90 ml) or Fluxapyroxad 250g/l+ Pyraclostrobin 250g/l 500 SC @ 20ml

VI	Fruit Development-I	<p><b>Need Based for Insects:</b> Chlorpyrifos 20 EC (100 ml) or Quinalphos 25 EC (100 ml)</p> <p><b>Need Based for Mites:</b> When population is more than 10 mites per leaf Hexythiazox 5.45 EC (40 ml) or Spiromesifen 22.9 SC (40 ml)</p>	<p><b>12-15 days after V spray</b></p> <p>Mancozeb 75 WP 300g or Captan 50 WP 300g or Propineb 70 WP 300g or Zineb 75 WP 300g or Ziram 80 WP 200g</p>
VII	Fruit Development-II	<p><b>For Insects:</b> Dimethoate 30 EC (100 ml) or Chlorpyrifos 20 EC (100 ml)</p> <p><b>For Mites:</b> Hexythiazox 5.45 EC (40 ml) or Fenazaquin 10 EC (40 ml) or Spiromesifen 22.9 SC (40 ml) or Summer Spray Oil (750 ml)</p>	<p><b>12-15 days after VI spray</b></p> <p>Metiram (55%) + Pyraclostrobin (5%) 60WG (100g) or Difenaconazole 25 EC (30 ml) or Flusilazole - 40EC (20ml) or Trifloxystrobin + Tebuconazole 75 WG (40g)</p>
VIII	Fruit Development-III	<p><b>Need Based for Insects:</b> Chlorpyrifos 20 EC (100 ml) or Dimethoate 30 EC (100 ml)</p> <p><b>Need Based for Mites:</b> If Population is more than 10 mites per leaf Fenazaquin 10 EC (40 ml) or Spiromesifen 22.9 SC (40 ml) or <b>Cyenoxyrafen 30 SC (30 ml)</b></p>	<p><b>12-15 days after VII spray</b></p> <p>Mancozeb 75 WP 300g or Zineb 75 WP 300g or Ziram 80 WP 200g or Ziram 27SC 600ml or Chlorothalonil 75WP150g</p>
IX	Fruit Development-IV	X	<p><b>A) (For ALB, Scab incidence )</b> Metiram(55%) +pyraclostrobin(5%) 60 WG (100g) or Zineb (68%) + hexaconazole (4%) 72 WP (100g) or Hexaconazole 5EC (50ml) or Myclobutanil 10 WP (70g)</p> <p><b>B ) (Sooty blotch, Fly speck and Marssonina)</b> Mancozeb 75WP 300g or Ziram 27 SC 600ml or Propineb 70 WP 300g or Ziram 80 WP 200g</p>
X	Pre-harvest	X	<p><b>Need Based - Long term storage (20-25 days before harvest)</b> Mancozeb 75WP 300g or Captan 50 WP 300g or Ziram 80 WP 200g or Zineb 75 WP 300g</p>
XI	Post- harvest	<b>Need Based for Insects:</b>	X

		Chlorpyrifos 20 EC (100 ml) <b>Need Based for Mites:</b> If Population is more than 20 mites per leaf Fenazaquin 10 EC (40 ml)	
--	--	--	--

1. Delayed dormancy should not go beyond green tip.
2. Give preference to (Captan 50 WP (300 g) in case rainy weather hampers green tip spray
3. Spray Captan 50 WP at least 10 days after oil Spray

**Disclaimer:**

- The molecules have been evaluated by SKUAST-K for bio-efficacy against apple diseases and pests, and the advisory/ information has been compiled for guidance and not for legal purposes.
- The advisory has been formulated in consultation and inputs received from Department of Horticulture / Agriculture Kashmir and Directorate of Enforcement Government of J&K.
- Use and sale of the products recommended in the schedule are subject to production of registration and label claim from CIB & RC, Govt. of India to be ascertained by Directorate of law enforcement Department of Jammu & Kashmir.

**Caution:**

- This schedule is devised for Kashmir Valley under normal weather conditions.
- For location specific decisions and under abnormal weather conditions, contact concerned Horticulture Development Officers/ KVK scientists for advice.
- For effective disease and pest management, ensure orchard sanitation through collection and destruction of fallen leaves, pruned/diseased/infected twigs and fallen/mummified fruits.

**Important Instructions**

- i. Chemicals at a given stage in the recommendations are shown in order of their efficacy / increasing cost.
- ii. Avoid mixing of fungicides, insecticides and spray suspensions.
- iii. Maintain a gap of 3-4 days between insecticide and fungicide spray.
- iv. Adjuvants/Stickers may be added for better efficacy of fungicides especially during rainy days. Sticker like Sandovit @ 50-75 ml/100 litre of suspension.
- v. Stickers should not be used with Dodine.
- vi. In case of heavy rains within 12 hours of spray the spray is to be repeated immediately (when adjuvants/stickers are not used).
- vii. Before conducting the spray inform the beekeepers in the vicinity of the orchard about spraying time; bee colonies should be kept preferably away from spraying areas.
- viii. Same pesticide should not be repeated continuously in two sprays.
- ix. Avoid spraying during high temperatures/rainy weather. All sprays should be conducted during early morning or evening hours to avoid phytotoxicity.
- x. No spray should be done during full bloom period.
- xi. Spraying of insecticides/fungicides should be stopped 3-4 weeks before harvesting of fruit.
- xii. Keep 60 cm of soil around trunks undisturbed.
- xiii. Apply balanced dose of nutrients (N: P: K + FYM) as per Package of Practices recommended by SKUAST-K to fruit trees.

- xiv. Under drought like conditions, 2-3 sprays of calcium chloride (dehydrated) @ 0.3-0.5% (3-5 g/lit) after pea size stage along with 0.15% boric acid (1.5 g/lit) at an interval of 10-15 days may be conducted).
- xv. After fruit-let stage, ensure periodical destruction of weeds beyond 60 cm around tree trunks.
- xvi. Ensure removal of borer infested twigs/branches and their subsequent destruction.
- xvii. Close monitoring of pests and diseases is important for effective management.

## **Do's and Don'ts of Pesticide Application**

### **Do's**

- Purchase Pesticides only from registered dealer(s) having valid license.
- Check Batch No. Registration No. Manufacture / Expiry Date on the labels.
- Always purchase with proper bill or invoice.
- Storage place should be well protected from direct sunlight or rain.
- Read instructions on pesticide container label carefully before use.
- Always use clear water for making pesticide suspension as per requirement.
- Use protective clothing viz. hand gloves, face masks, aprons, etc to cover whole body.
- Always protect your nose, eyes, ears, hands etc, from spill of spray suspension.
- Use recommended dose of pesticides.
- Select right kind of equipment for spraying.
- Spray pesticide during morning or evening hours.
- Agitate spray suspension continuously while spraying.

### **B) Don'ts**

- Don't Use muddy or stagnant water for preparing pesticide solution.
- Don't Prepare or spray pesticides without wearing protective clothing.
- Avoid spilling of pesticide solution while filling or spraying.
- Don't use over or sub lethal dose of pesticide.
- Don't spray pesticides during full bloom period.
- Don't spray during day time when temperature is high.
- Don't mix various pesticides other than those recommended by SKUAST-K.
- Don't eat, drink, chew or smoke during spraying or preparing pesticide suspension.
- Don't transfer pesticide from original to other container.
- Don't use leaky or defective equipment's.
- Don't blow / clean clogged nozzle with mouth.

## Annexure-I

### Pesticide Formulations Evaluated and Recommended for Spray Schedule of Apple (2021)

#### (A) Fungicide

S.No	Fungicides	Trade name	Name of the Company
1	Captan	Captaf (50 WP)	M/S Rallis India Ltd.
		Deltan (50 WP)	M/S Coromandel Agrico Pvt. Ltd.
		Kohicap (50 WP)	M/S FIL Industries Ltd.
		Captax (50 WP)	M/S India Pesticide Ltd.
		Merimain (50 WP)	M/S Adama India Pvt. Ltd
		Captra (50 WP)	M/S Indofil Industries Ltd.
		Kri-Captan (50WP)	M/S Krishi Rasayan Exports Pvt. Ltd.
		Panther (50WP)	M/S HPM Chemicals & Fertilizers Ltd.
2	Chlorothalonil	Tata Ishaan (75 WP)	M/S Rallis India Ltd.
3	Difenaconazole	Score (25 EC)	M/S Syngenta India Ltd.
		Rubigan-D(25 EC)	M/S FIL Industries Ltd.
		Casper (25 EC)	M/S Godrej Agrovet Ltd.
		Karara (25 EC)	M/S Agro Life Science Corporation
4	Dodine	Noor (65 WP)	M/S Indofil Industries Ltd.
		Dodino FIL (40 SC)	M/S FIL Industries Ltd.
		Super Star (65 WP)	M/S FIL Industries Ltd.
5	Flusilazole	Cursor (40 EC)	M/S Dhanuka Agritech Ltd.
		Governor (40 EC)	M/S FIL Industries Ltd.
6	Hexaconazole	Contaf (5 EC)	M/S Rallis India Ltd.
		Mainex (5EC)	M/S Adama India Pvt. Ltd.
		Krizole (5EC)	M/S KrishiRasayan Exports Pvt. Ltd.
		Sitara (5EC)	M/S Indofil Industries Ltd.
		Hexahit 5Ec	M/S Hindustan Pulvarizing Mills
		Titan (5 EC) *	M/S Sudarshan Chemical Ltd.
		Envil (5 EC)	M/S FIL Industries Ltd.
7	Mancozeb	Indofil M-45 (75 WP)	M/S Indofil Industries Ltd.
		Dithane M-45 (75 WP)	M/S Dow Agro Science Mumbai
		Hindustan M-45(75 WP)	M/S Hindustan Pulverising Mills Ltd.
		Macoban (75 WP)	M/S Adama India Pvt. Ltd.
		Luzem-45(75 WP)	M/S Cheminova India Ltd.
		Kohinoor M-45 (75 WP)	M/S FIL Industries Ltd.
		Mount (75 WP) *	M/S Bharat Insecticides Ltd.
8	Metiram 55% + Pyraclostrobin 5%	Cabrio Top (60 WG)	M/S BASF India Ltd.
		Clutch (60 WG)	M/S P. I Industries
9	Myclobutanil	Grapple (10 WP)	M/S FIL Industries Ltd.
		Boon (10 WP)	M/S Indofil Industries Ltd.
		Nagarjuna Index (10 WP)	M/S NAACL Ind.Ltd.
		Systhane (10 WP)	M/S Dow Agro Science Mumbai Ltd.

		Myclomain (10 WP)	M/S Adama India Pvt. Ltd.
		Insyst (10 WP)	M/S Biostadt India Ltd.
		Revolve (10 WP)	M/S Bharat Insecticides Ltd.
10	Propineb	Antracol (70 WP)	M/S Bayer Crop Science Ltd.
		Proximan (70WP)	M/s Adama India Pvt. Ltd
		Scale (70 WP)	M/S KrishiRasayan Exports Pvt. Ltd.
		Filprostar (70WP)	M/S FIL Industries Ltd.
		Sway (70 WP)	M/S Cheminova India Ltd.
		Jannat 70 WP	M/S Jain Shree Raisan Udoyog Ltd.
		Sanipeb (70WP)	M/S P.I Industries
11	Trifloxystrobin 25% + Tebuconcazole 50%	Nativo (75 WG)	M/S Bayer Crop Science Ltd.
12	Ziram	Cuman-L (27 W/V)	M/S Syngenta India Ltd.
		Zed-78 (80 WP)	M/S FIL Industries Ltd.
		IPL Ziram-80 (80 WP)	M/S India Pesticide Ltd
		Zirex-L (27 SC)	M/S FIL Industries Ltd.
		IPL Ziram-27 (27SC)	M/S India Pesticide Ltd
13	Zineb	Indofil Z-78 (75 WP)	M/S Indofil Industries Ltd.
		Neutec (75WP)	M/S UPL & Marketed by M/S Swal Corporation Ltd.
14	Zineb 68% + Hexaconazole 4%	Avtar (72 WP)	M/S Indofil Industries Ltd
15	Fluxapyroxad 250g/l+ Pyraclostrobin 250g/l 500 SC	Merivon 500 SC	M/S BASF India Limited.

**\* Fungicides without trade name certificate, the respective companies have to submit an affidavit from 1<sup>st</sup> class magistrate regarding submission of documents with in a week's time**

**Note: Use and sale of the products recommended in the schedule are subject to production of registration and label claim and trade name from CIB & RC, Gol to be ascertained by Directorate of law enforcement Govt, J&K.**

**(B) Insecticide**

<b>A</b>	<b>Oils</b>	<b>Trade name</b>	<b>Name of the Company</b>
<b>1.</b>	Horticulture Mineral Oils for Delayed Dormant Spray	MAK All Season HMO	M/S Bharat Petroleum Corp. India Ltd.
		HP Tree Spray Oil	M/S Hindustan Petroleum Corp. Ltd
		Servo	M/S Indian Oil Corporation Ltd.
		Balspray HMO	M/S Balmer Lawrie & Company Ltd.
<b>2.</b>	Horticulture Mineral Oils for Summer Spray	MAK All Season HMO	M/S Bharat Petroleum Corp. India Ltd.
		HP HMO	M/S Hindustan Petroleum Corp. Ltd
		Servo	M/S Indian Oil Corporation Ltd.

Supply of HMO's is subject to conditions as laid down by Director Law enforcement vide No. HORT/103/2016/Part file dated 16-02-2021 or any other instructions conveyed by the Government subsequently.

<b>B</b>	<b>Insecticides</b>	<b>Trade name</b>	
<b>1</b>	Chlorpyrifos	Coroban (20 EC)	M/S Coromandel Agrico Pvt. Ltd.
		Kohiban (20 EC)	M/S FIL Industries Ltd.
		Dursban (20 EC)	M/S Dow Agro Science Mumbai Ltd.
		Tafaban (20 EC)	M/S Rallis India Ltd.
<b>2</b>	Dimethoate	Roger (30 EC)	Manufactured Lupin & Marketed by M/S Cheminova India Ltd
		Tafagor (30 EC)	M/S Rallis India Ltd.
<b>3</b>	Quinalphos	Ekalux (25 EC)	M/S Syngenta India Ltd.
<b>4</b>	Thiocloprid	Alanto 240 SC (21.7%)	M/S Bayer Crop Science Ltd.
<b>C</b>	<b>Acaricides</b>	<b>Formulations</b>	
<b>1</b>	Fenazaquin	Majestic (10 EC)	M/S FIL Industries Ltd.
<b>2</b>	Hexythiazox	Maiden (5.45 EC)	M/S Biostad India Ltd.
<b>3</b>	Spiromesifen	Oberon 240 SC (22.9%)	M/S Bayer Crop Science India Ltd.
<b>4</b>	Cyenoxyrafen	NC-512 30SC (Kunoichi) *	M/S Insecticide India Ltd.

WP: Wettable Powder, EC: Emulsifiable Concentrate, SC: Suspension Concentrate, SL: Sprayable Liquid, WG; Water Dispersible Granules

**\* Insecticide without trade name certificate, the respective companies have to submit an affidavit from 1<sup>st</sup> class magistrate regarding submission of documents with in a week's time**