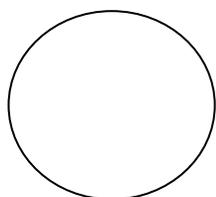


SPRAY SCHEDULE YEAR 2022 (APPLE)



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SPRAY SCHEDULE FOR THE CONTROL OF DISEASES OF APPLE YEAR 2022

S. No.	Tree Stage	Name of Chemical 200 L of Water	Quantity of Chemical for	Control of Diseases	Remarks
1.	2.	3.	4.	5.	6.
1.	Green tip	Captan* or Dodine or Ziram*	600gm 200gm 600 (ml/gm)	 Scab	
		Fluxapyroxad 75g/l + Difenoconazole 50 g/l SC	60 ml	Scab/powdery mildew	
2.	Pink bud	Mancozeb* or Propineb or Difenoconazole	600 gm 600 gm 30 ml	 Scab	
3.	Petal fall/ Pea Stage	Carbendazim* or Thiophanate Methyl* or Hexaconazole or Myclobutanil or Flusilazole 40% EC	100 gm 100 gm 100 ml 80 gm 50ml	 Scab	
		Tebuconazole 50% +Trifloxystrobin 25% WG or Tebuconazole 8% + Captan 32% SC or Boscalid 25.2% + Pyraclostrobin 12.8% w/w WG or Metrafenone 500g/l SC	80 gm 500 ml 50 gm 20 ml	 Powdery mildew	
		Carbendazim 12% + Mancozeb 63% WP	500 gm	Scab/powdery mildew	
		Carbendazim 25% + Flusilazole 12.5% SC	160 ml	Alternaria leaf spot	

4. Fruit Development (Walnut size)	Mancozeb*	600gm	Scab	Do not spray Dodine if temperature is above 30°C and slow drying condition prevails
	or Propineb	or 600gm		
	or Dodine	150 gm		
	Metiram 55% +	200gm	Alternaria leaf spot/ Blight/Pre mature leaf fall	
	Pyraclostrobin 5% WG or Tebuconazole 8% + Captan 32% SC	500 ml		
	or Fluxapyroxad 250 g/l + Pyraclostrobin 250 g/l 500 SC	20 ml	Alternaria leaf spot/ Premature leaf fall	
or Fluopyram 17.7% w/w + Tebuconazole 17.7% w/w SC	126 ml	Alternaria leaf spot/ Premature leaf fall		
or Dodine 40% SC	150 ml	Alternaria leaf spot/ Premature leaf fall		
5. Fruit Development (20 days after 4th spray)	Tebuconazole 50% + Trifloxystrobin 25% WG	80 gm	Pre-mature leaf fall	
	Propineb or Zineb*	600 gm	Scab	
	Zineb*	600 gm	Scab, Black rot	
6. Pre harvest (20-25 days before harvest)	Carbendazim 25% + Flusilazole 12.5% SC	160 ml	Alternaria leaf spot/ Premature leaf fall	
	Captan*	600 gm	Scab/Fly speck/Bitter rot	
	or Ziram*	600 (ml/gm)	Scab	
	Metiram 55% +	200gm	Alternaria leaf spot/ blight	
Pyraclostrobin 5% WG Fluopyram 17.7% w/w + Tebuconazole 17.7% w/w SC	126 ml	Alternaria leaf spot/ Premature leaf fall/Fruit Rot		
7. After harvest	Copper oxychloride	600 gm	Canker	

Note :- Points for consideration.

1. This spray schedule is for normal weather conditions.

2. In case of heavy rains within 12 hours of spray, the spray is to be repeated within seven days.
3. Do not use the same chemical, spray after spray.
4. Pesticides should be sprayed when there is favourable climate and chance(s) of diseases.
5. Do not mix Dodine with other pesticides/chemicals.
6. Do not mix any other pesticide/chemical/micro-nutrient/growth regulator/hormone with the above recommended pesticides to avoid russeting and other disorders. In case there is necessity, these may be sprayed separately.
7. The fallen leaves of apple should be collected and decomposed in a compost pit or spray of 5% urea may be done on orchard floor on fallen leaves to ensure fast decomposition of infected leaves .
8. Copper oxychloride although tested by the Dr. Y. S. Parmar UHF Nauni and essentially required at the above stage of the tree but product is not registered with CIB & RC till date.
9. For the control of White root rot, drench the basin area 3-4 times, with Carbendazim (0.1%) or Aureofungin (0.02%) + Copper Sulphate (0.02%) with the onset of rainy season in 15-20 cm deep holes around the tree basin. During winters, expose the root system of infected trees and cut the infected portion and apply Bordeaux paint.
10. For the control of Collar rot, Scarify wounds near collar region and apply Bordeaux paint or any other Copper fungicide based paint during winter season. Drench the whole tree basin at a distance of 30 cm from tree trunk with Mancozeb (0.3%) during rainy season,
11. In the high scab prone areas, 12-14 days interval should be maintained between the sprays upto primary scab stage i.e. fruit set taking favorable climatic condition into consideration otherwise time interval may be adjusted accordingly.
12. Captan spray should be avoided before and after the oil spray for minimum 15 days.
13. Dodine should not be mixed with hard water.
14. Use of bio-control agents/bio-pesticides can be used against collar rot, root rot and root borers and predators can be used for management of insect attack.
15. Preventive measures for Apple diseases:
 - a. **Crown gall or Hairy root-** Avoid injury to the collar region and rouge out infected plants and destroy them.
 - b. **Foliar Diseases-** As the pathogen overwinters on the fallen leaves and therefore orchard sanitation by removing weeds and bushes and by removing the fallen leaf litter from the orchard floor, is one of the most important measures to reduce the initial inoculum.
Adopt proper pruning of trees for adequate air circulation and rapid drying of foliage, thus prevents the development of secondary lesions in the orchard.
 - c. **Powdery Mildew-** Prune off the silver terminals and destroy them.

- d. **Canker-** These include removal and destruction of infected plant parts, mummified fruits, dead twigs and pruned branches, avoiding mechanical injuries, application of balanced fertilizers on the basis of leaf and soil analysis, proper irrigation during hot dry periods to avoid tree stress, protecting plants from high and low temperature injuries and ensuring effective control of insect-pests and diseases.

Spray of copper oxychloride @ 600gm/200L at post harvest and after pruning late dormancy is effective in lowering the incidence of different cankers. This takes care of development of different fungi causing canker.

Recommendations against Hail damage:-

1. Spray 100 gm Carbendazim or 600 gm Mancozeb in 200 L of water immediately after hail.
2. Spray 200 gm Boric acid + 500 gm Zinc Sulphate + 250 gm Quick lime in 200 L of water within 3-4 days of hail storm.
3. After 10 to 12 days, a spray of micro-nutrients like Agromin, Multiplex or Microvit @ 400 to 600 g per 200 L of water is also recommended. Spray the hail affected apple orchard with 1 kg Urea in 200L of water.

Note:-

- * **The pesticides are proposed to be banned viz. Captan, Ziram, Mancozeb, Carbendazim, Thiophanate methyl, Zineb, Malathion & Chlorpyrifos by the Government vide Gazette Notification No. CG-DL-E-18052020-219423, Extraordinary Part-II- Section-3-Subsection (ii), dated 18th May 2020 regarding- Banning of Insecticides Order, 2020.**

SPRAY SCHEDULE FOR THE CONTROL OF INSECT & MITE PESTS OF APPLE, YEAR 2022.

S. No.	Tree stage	Name of Chemical	Quantity of Chemical for 200 L of Water	Control of Pests
1.	2.	3.	4.	5.
1.	Half-inch Green Tip	Horticultural Mineral Oil	4 lt	Sanjose scale & mite
2.	Pink Bud	Thiacloprid	100 ml	Thrips
3.	Petal fall	Spiromesifen or Hexythiazox	60 ml 200ml	Mites
		Oxy-demeton methyl	200 ml	Sanjose scale
		Malathion*	200 ml	Aphid
4.	Fruit development (Walnut size)	Fenazaquin or Propargite or Horticultural Mineral Oil	50 ml 200 ml 2 lt	Mites
5.	Fruit development (20 days after 3 rd spray)	Hexythiazox or Spiromesifen 60 ml or Propargite 42% + Hexythiazox 2% EC	200 ml 200 ml	Mites
6.	Fruit development (20 days after 4 th spray)	Fenazaquin or Propargite	50 ml 200 ml	Mites
7.	Pre harvest (20-25 days before harvest)	Malathion* Oxy-demeton methyl	200 ml 200ml	Aphid Sanjose scale
8.	After harvest	Chlorpyrifos*	400 ml	Woolly Apple Aphid

Note:-

1. Avoid repetition of same Insecticides/Acaricides.
2. While spraying for the control of mites on the tree, also spray the basin area to ensure optimum control.
3. Drench the basin area with Chlorpyrifos after harvesting @ 4ml/ltr of water for the control of woolly apple aphid and root borer.
4. Horticultural Mineral Oils are although tested by Dr. Y. S. Parmar UHF Nauni and essentially required for scale and mite pests but not registered till date by the CIB & RC except HP Spray Oil E. However, matter is under process.

5. Minimum insecticidal spray should be given from April-June for the safety of Lady bird beetles, syrphid flies and other beneficial insects as most of useful insects are usually active during these months.
6. Do not spray any other pesticides on open flowers to save pollinating insects.
7. Methyl Euginal pheromone trap may be installed in the orchard to check fruit fly attack well in time.
8. For early surveillance of insect-pest, trap crops may be planted around the orchard.

RECOMMENDED BRAND NAMES OF PESTICIDES

S. No.	Common Name	Brand Names
1	2	3
A. Fungicides:		
1.	Carbendazim 50 WP*	Dhanustin/Bavistin/Mavistin/Derosal/ Benfil/ Gilzim / Carbestin/ Goldstin
2.	Captan 50 WP*	Captaf/ Dhanutan/Kohicap/Masstan/ Captax/ Capgold
3.	Copper Oxychloride 50 WP	Blitox/Fytolan/Masstox/Copter/Trucop/Riva
4.	Dodine 65 WP	Sylit/Himdin/ Tohfa /Noor
5.	Difenoconazole 25 EC	Score/Scale/Dizole/Rubigan D/Karara
6.	Metiram 55% + Pyraclostrobin 5% WG	Cabrio Top 60WG
7.	Hexaconazole 5 EC	Contaf/ Hexzol /Sitara/ Titan /Glow /Envil/Hexcon/Krizole
8.	Mancozeb 75WP*	Indofil M-45/ Dithane M-45/ Mass M-45/ Kohinoor M-45/ Dhanuka M-45/ Abic M-45 / Emthane M-45/ Uthane M- 45/ Hindustan M-45/GoldM-45/Marlett M-45
9.	Myclobutanil 10WP	Systhane /Boon / Index/ Grapple
10.	Propineb 70 WP	Antracol/Aaroosh/Scale 70% WP
11.	Thiophanate methyl 70WP*	Roko/ Topsin-M /Alert/ Stop/Trust/Key
12.	Zineb 75WP*	Indofil Z-78
13.	Ziram 27% SC*	Cuman L
14.	Ziram 80% WP*IPL	Ziram-80
15.	Tebuconazole 50% +Trifloxystrobin 25% WG	Nativo75 WG
16.	Tebuconazole 8% + Captan 32% SC	Shamir
17.	Fluxapyroxad 75g/l + Difenoconazole 50 g/l SC	Sercadis Plus 12.5 SC
18.	Carbendazim 12% + Mancozeb 63% WP	SAAF
19.	Boscalid 25.2%	Signum 38% WG

+ Pyraclostrobin 12.8% w/w WG

- | | |
|---|-------------------------------|
| 20. Metrafenone 500g/l SC | Acrisio 50 SC |
| 21. Fluxapyroxad 250 g/l
+ Pyraclostrobin 250 g/l 500 SC | Merivon 50 SC |
| 22. Flusilazole 40% EC | Cursor 40% EC/Governor 40% EC |
| 23. Carbendazim 25%
+ Flusilazole 12.5% SE | Lustre37.5% SE |
| 24. Fluopyram 17.7% w/w
+ Tebuconazole 17.7% w/w SC | LUNA Experience |
| 25. Dodine 40% SC | DodinO FIL |

2 Insecticides, Acaricides and Spray oils:

- | | |
|---|---|
| 1. Chlorpyrifos 20 EC* | Dursban/Durmet/Danusban/Massban/Force/Tricel/
Navigator/Goldban |
| 2. Fenazaquin 10 EC | Magister/Majestic |
| 3. Hexythiazox 5.45% | Maiden / Endurer 5.45% EC |
| 4. Malathion 50 EC* | Cythion/Massthion |
| 5. Oxy-demeton Methyl 25% EC | Metasystox |
| 6. Propargite 57 EC | Omite/ Simba |
| 7. Spiromesifen 22.9 % SC | Oberon |
| 8. Horticultural Mineral oil | Orchex 796/E-C-Tron Plus/Arvofine /Orchol-13/Servo/MAK All
Season/Hindustan Petroleum HMO/Rilso-999/Atso Supreme Oil/
Petro Star HMO/Balmerol Balspray HMO/HP Spray Oil E |
| 9. Thiacloprid 21.7% SC | Alanto240 SC |
| 10. Propargite 42% +
Hexythiazox 2% EC | Ceasemite |
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GROWTH STAGES IN APPLE TREES— SILVER TIP TO FRUIT SET



1. Silver Tip

2. Green Tip

3. Half-Inch Green Tip



4. Tight Cluster

5. Pink Bud



6. Bloom

7. Petal Fall

8. Fruit Set