Cotton whitefly Questions & Responses for AI

Q1. How will we identify white fly and its infestation in cotton field?

Answer- Identification - Nymphs are yellowish and brownish, sub elliptical and scale like. They are found in large numbers on underside of leaves. Adults are tiny and white in colour. They have a yellow body dusted lightly with a white waxy powder. Females are 1.1 –1.2 mm long; males are slightly smaller.

Infestation- Leaves curl upwards and the plant vigour reduces. Leaves become shiny with honeydew or darkened by sooty mould growing on honeydew

Q2. What is the colour of cotton whitefly?

Answer- Nymphs are yellowish and brownish & adults are White in colour.

Q3. Which part of the cotton plant mostly affected by whitefly?

Answer- Leaves are mostly affected by whitefly.

Q4. How whitefly damage the cotton plants?

Answer- Both nymphs and adults suck the cell sap from the leaves which turn pale, curl and dry up. They secrete honeydew on leaves that invites black sooty mould. Ants are also attracted to the honeydew.

Q5. What are the economic losses happened due to whitefly?

Answer- Damage from direct feeding reduces the photosynthetic activities of the plant and hence the yield. Indirect damage results from lint contamination with honeydew and associated fungi and through transmission of leaf curl virus disease. Late season severity affects the seed development and the lint quality.

Q6. What is the stage of cotton during which whitefly mostly observed?

Answer- Whitefly mostly observed During Vegetative and Flowering stage of cotton.

Q7. What are the symptoms observed in cotton ecosystem due to incidence of cotton whitefly?

Answer- 1. Leaves curl upwards and the plant vigour reduces.

2. Leaves become shiny with honeydew or darkened by sooty mould growing on honeydew

Q8. What are the methods for surveillance of whitefly?

Answer- White fly can be monitored by Yellow sticky trap and visual symptoms of damage.

Q9. What is the ETL of whitely in cotton ecosystem?

Answer- More than 10 whiteflies found in middle region of the plant in >50% (two out of four) of plants. Flight of adults producing a smoky appearance when plants are shaken mildly.

Q10. Wheather seed treatment is effective for management of cotton whitefly?

Answer- Yes.

Q11. Are there any resistant/ tolerant Cotton cultivars available in India for management of Cotton whitefly?

Answer- Yes, Supriya, Kanchana, LK-861, RS-875, RS-2013 are the resistant/ tolerant Cotton cultivars available in India for management of Cotton whitefly.

Q12. What are the preventive measures needs to be taken for the management of whitefly in cotton ecosystem?

Answer- 1. Avoiding monocropping

2. Crop rotation

3. Seed treatment,

4. Installation of yellow sticky trap,

5. Use of biopesticides like Neem seed karnel extract

6. Avoide excess use of nitrogenous fertilizers

7. Avoid use of synthetic pyrethroid pesticides

Q13. Is there any need to undertake management practises on community basis, if yes what is its significance?

Answer- Yes, there is need of management of white fly on community basis that will help to break the life cycle of white fly.

Q14. What are the cultural management practices for management of cotton whitefly?

Answer- 1. Avoid late sowing and adopt crop rotation with crop which is not the host of whitefly wherever crop rotation is recommended.

2. Maintenance of good field sanitation by destroying and removing the crop residues, and weeds.

3. Growing vegetables in short periods and allowing maximum time between host crops of whitefly reduces its pest status on cotton.

Q15. What are the mechanical management practices for management of cotton whitefly?

Answer- Grow maize as intercrop and cowpea on border to attract predators and parasitoids.

Q16. What are the precautions needs to be taken by farmers to avoid the incidence of whitefly every year?

Answer- 1. Avoiding monocropping

2. Crop rotation

3. Seed treatment,

4. Installation of yellow sticky trap,
5. Use of biopesticides like Neem seed karnel extract
6. Avoide excess use of nitrogenous fertilizers
7. Avoide use of synthetic pyrethroid

Q17. Where farmers can get complete information for timely management of whitefly on cotton?

Answer- farmers can get complete information for timely management of whitefly on cotton from following Institutes/Centres,

1.Central IPM centres
2. State agriculture universities
3. KrishiVighyan Kendra
4. State agriculture department
5. ICAR institutes.

Q18. Is it desirable to mix more number of chemical insecticides / biopesticides in one tank during spraying for the management of cotton whitefly?

Answer- No.

Q19. What will be the side effects of mixing of more insecticides together without recommendation in cotton ecosystem for management of whitefly?

Answer- Physical incompatibility or improper mixing of pesticides which sometimes results to clogging of nozzles, unwanted residues on crops and ineffectiveness.

Q20. What is the meaning of IPM?

Answer- Integrated Pest Management is the careful consideration of all available pest control techniques and subsequent integration of appropriate measures that discourage the development of pest populations. It combines biological, chemical, physical and crop specific (cultural) management strategies and practices to grow healthy crops and minimize the use of pesticides, reducing or minimizing risks posed by pesticides to human health and the environment for sustainable pest management

Q21. Why IPM needs to be adopted for management of Cotton whitefly?

Answer- 1. To minimize the excess use of pesticides with the least possible disruption to agro-ecosystems.

2. To minimize the cost of cultivation.

Q22. What is procedure of survey of whitefly in cotton ecosystem by farmer?

Answer- Procedure of survey of whitefly in cotton ecosystem as follows,

1. Field observations on insect pests and diseases are to be initiated after 20 days of sowing.

2. In each field select five spots randomly in zigzag manner (at least 5 feet inside the border).

3. At each spot select 10 plants randomly/ field for recording observations.

4. Observe the upper middle and lower leaves of selected plants.

5. Count the average number of whiteflies per leaf to know the infestation of white fly.

Q23. Why only recommended insecticides required tobe spray in cotton ecosystem for management of whitefly?

Answer- For effective management of whitefly and to avoid insecticide resistance in whitefly.

Q24. Can we increase the recommended dose of chemical insecticides for management of huge population of whitefly?

Answer- No.

Q25. Is there any impact of crop rotation to avoid the incidence of whitefly in cotton?

Answer- Yes,Crop rotation replaces a crop that is susceptible to a serious pest with another crop that is not susceptible. Each food crop comes with its own set of pests that attack that particular crop. By planting a different crop each time, the farmer is able to starve out those pests.

Q26. If recommended insecticides / biopesticides are not available in market? Can we spray other than recommended insecticides / bio pesticides in cotton ecosystem?

Answer- No.

Q37. What is the feeding habit of Whitefly in cotton ecosystem?

Answer- Nymphs and adults lacerate the tissue and suck the sap from the upper and lower surfaces of leaves. They inject saliva and suck the lysed contents of plant cells

Q28. Can I count the whitefly population in cotton field visually? If not why?

Answer- No, because whiteflies are fast flying insect.

Q29. What is the observation procedure of whitefly in cotton ecosystem during survey?

Ans: Observation procedure of survey of whitefly in cotton ecosystem as follows,

1. Field observations on insect pests and diseases are to be initiated after 20 days of sowing.

2. In each field select five spots randomly in zigzag manner (at least 5 feet inside the border).

3. At each spot select 10 plants randomly/ field for recording observations.

4. Observe the upper middle and lower leaves of selected plants.

Q30. What do you mean by natural enemies?

Answer- Natural enemies are farmers friends which kills/ check the population of harmful insects.

Q31. What are the natural enemies of cotton whitefly available in cotton ecosystem?

Answer- *Chrysoperlaspp*, Lady Bird beetle, Dragonfly, Damselfly. Predatory ants, Praying Mantis, wasp, spider are the natural enemies of cotton whitefly available in cotton ecosystem.

Q32. Can we multiply natural enemies of cotton whitefly in laboratory? If yes, which are they?

Answer- Yes, we can multiply natural enemies such as *Chrysoperla* spp in laboratory conditions.

Q33. Can we found incidence of whitefly throughout cotton season?

Answer- Yes, whitefly incidence on cotton can occur throughout the season.

Q34. Is it economical to manage the incidence of cotton whitefly during harvesting of cotton? If not why?

Answer- No, because spraying at the time of harvesting is not feasible which may leads to increase the cost of cultivation.

Q35. Why systemic insecticides are required to be spray for management of whitefly?

Answer- Because piercing and sucking type of feeding mechanism of white fly.

Q36. What are the possible reasons for the outbreak of whitefly in cotton?

Answer- Following are the possible reasons for the outbreak of whitefly in cotton

1. Favourable environmental conditions
2. Insecticide resistance in whitefly
3. Excessive use of nitrogenous fertilizers.
4. Monocropping.

Q37. What are the limitations of farmers for the timely management of whitefly?

Answer- 1. Monocropping of cotton.

2. Lack of awareness about identification of pest, its life cycle and integrated management of whitefly.

Q38. Why only yellow sticky traps are used for monitoring of whitefly?

Answer- Whitefly attracted towards yellow colour.

Q39. How many yellow sticky traps per acre needs to be installed for monitoring of whitefly in cotton ecosystem?

Answer- yellow sticky traps @ 40 per acre for monitoring of whitefly in cotton.

Q40. How yellow sticky traps needs to be install in cotton ecosystem?

Answer- Install yellow sticky traps @ 40 per acre, 1 to 1.5 ft. above crop canopy with the help of bamboo stick.

Q41. How incidence of whitefly occur in my field every year?

Answer- Possible reasons of whitefly incidence-

1. Excessive use of nitrogenous fertilizers makes crop succulent which attracts whiteflies.

2. Hot and humid conditions favours the incidence of whitefly.

3. Monocropping of cotton crop.

Q42. What is the life cycle of whitefly?

Answer- The female whitefly lays the eggs singly on the under surface of leaves and mostly on the top and middle crop canopy. Each female is capable of laying about 120 eggs. The incubation period varies from 3-5 days during spring and summer, 5-17 during autumn and >30 days during winter. The nymphs after hatching fix themselves to the underside of the leaves and they moult thrice before pupation. The nymphal period varies from 9-14 days during summer, and 17-19 days during winter. The pupal period is 2-8 days. The total life-cycle ranges from 14 to 107 days depending upon the weather conditions. There are about 12 overlapping generations in a year and the pest also reproduces parthenogenetically at times.

Q43. Which is the damaging stage of whitefly in cotton ecosystem?

Answer- Both nymph and adult are the damaging stage of whitefly in cotton.

Q44. What are the favourable atmospheric conditions for multiplication of whitefly?

Answer- The ideal conditions for growth are 27^{o}C and 71% relative humidity, hot and humid conditions favour the insect.

Q45. What are precautions needs to be taken during spraying of chemical insecticides by the farmers?

Answer- 1.Apply only recommended dose and dilution.

2.Spray operation should be conducted on sunny day in general.

3.Spray operation should be conducted in the wind direction.

4.After spray operation, sprayer and buckets should be washed with clean water using detergent/soap.

5.Avoid the entry of animals/workers in the field immediately after spray.

6.Never enter in the treated field immediate after spray without bearing protective clothings.

7. Use protective clothings viz., hand gloves, face masks, cap, apron, full trouser, etc. to cover whole body.

Q46. What is label claim of pesticides? Why it is necessary?

Answer- The pesticide label is the information approved by the CIB&RC to comply with all instructions and use directions provided on the pesticide container/leaflet for safe and judicious use of the product. It also includes information about active ingredient(s), targeted pests and the targeted crop(s).

Q47. What are the recommended bio insecticide available in India for management of whitefly in cotton?

Answer- Use one of the following bioinsecticide for management of whitefly in cotton.

Bioinsecticides	Dose/ha		Dilution in water (liter/ha)	Waiting period (Days)
	a.i. (g)	Formulation (g/ml)/%		
Azadirachtin 0.15% EC w/w Min. Neem Seed Kernel Based	-	2500-5000	500-1000	05
Azadirachtin 00.03% WSP (300 PPM) Neem Oil Based	-	2500-5000	500-1000	07
Azadirachtin 05.00% w/w Min. Neem Extract Concentrates	-	375.0	750	05
*Verticilliumlecanii*1.15%WP, (1x108 CFU/gm min) Strain – AS MEGH-VL Accession No – MCC-1028	-	2500	500	-

Q48. What are Chemical insecticides recommended for management of whitefly?

Answer- Use one of the following insecticides for management of whitefly in cotton.

Chemical	**Dosage/Ha**			**Waiting Period(Days)**
	a.i (gm)	**Formulation (gm/ml)**	**Dilution in Water (Liter)**	
Acetamiprid 20.00% SP	20.00	100.00	500-600	15
Afidopyropen 50 g/L DC	50.00	1000	500-750	25
Bifenthrin 10.00% EC	80.0	800	500	15
Buprofezin 25.00% SC	250.0	1000	500-750	20
Buprofezin 70.00% DF	250-300	357-429	500	20
Chlorpyrifos 20.00% EC	250	1250	500-1000	-
Clothianidin 50.00% WDG	20.0-25.0	40.0-50.0	500	20

Diafenthiuron 47.80% SC	239	500	500	30
Diafenthiuron 50.00% WP	300	600	500-1000	21
Dinotefuran 20.00% SG	25-30	125-150	500	15
Ethion 50.00% EC	750-1000	1500-2000	500-1000	-
Fenpropathrin 30.00% EC	75-100	250-340	750-1000	14
Fipronil 5.00% SC	75-100	1500-2000	500	06
Flonicamid 50.00% WG	75	150	500	25
Imidacloprid 48.00% FS	300-540	500-900	-	-
lmidacloprid 70.00% WS	350-700	500-1000	-	-
lrnidacloprid 17.80% SL	20-25	100-125	500-700	40
Monocrotophos 15.00% SG	200	1333	500-1000	58
Monocrotophos 36 % SL	150	375	500-1000	-
Profenofos 50.00% EC	500	1000	500-1000	15
Pyriproxyfen 10.00 % EC	100	1000	500	31
Pyriproxyfen 10.00 % EC	50-60	500-700	500	50
Pyridaben 20.00% w/w WP	100	500	500	28
Spiromesifen 22.90% SC	144	600	500	10
Thiacloprid 21.70% SC	120-144	500-600	500	52
Thiamethoxam 25.00% WG	50	200	500-750	21
Acephate 50.00% + Imidacloprid 1.80% SP	518	1000	500	40
Buprofezin 15.00 % +Acephate 35.00% w/w WP	187.5+437.5	1250	500	-
Diafenthiuron 47.00%+Bifenthrin 09.40% w/w SC	293.75+58.7	625	500	30
Acetamiprid 25.00% +Bifenthrin 25%WG	80	160	500	33
Phosmet 50%WP	600	1200	500	47
Tolfenpyrad 15% EC	150	1000	500	26