

**CROP WEATHER SITUATION
METEOROLOGICAL DATA OF
ICAR-INDIAN INSTITUTE OF HORTICULTURAL RESEARCH
HESSARAGHATTA LAKE P.O., BANGALORE – 560 089**

Period: 1st to 15th January, 2019

Latitude: 13^o7¹ N

Longitude: 77^o 29¹E

Altitude: 890 M

Fortnight	Temperature (°C)		Relative Humidity (%)		Evaporation (mm)	Wind speed (km/h)	Total Rainfall (mm)
	Average Max.	Average Min.	Average at 7.30AM	Average at 1.30PM			
January 1 st to 15 th , 2019	28.9	7.4	84.5	27.7	4.67	3.53	0.0
	(28.1)	(16.3)	(74.2)	(42.9)	(3.9)	(2.5)	(0.0)

* Figures in the parentheses indicate the average values during the corresponding period for the previous 5 years

Fortnight from 1st to 15th January, 2019

During the first fortnight of the month i.e., from January 1st to 15th, 2019, the average maximum was higher by 0.4^oC and minimum temperature was lower by 6.8^oC respectively, as compared to the previous fortnight. The average maximum temperature was higher by 0.5^oC and minimum temperature was lower by 0.2^oC, respectively, as compared to the average values of the corresponding period for the previous five years. The percent relative humidity during morning was higher by 2.8% and in the afternoon it was lower by 20.7% respectively, as compared to the previous fortnight. There was no rainfall during the fortnight.

Crop weather situation

The mean temperature during the first fortnight of January, 2019 was higher when compared to the average of last five years. The rainfall received during this period was less compared to the average of the last five years. Protective irrigation needs to be provided. Liberal application of FYM is recommended especially for the perennial horticulture crops to conserve moisture and for meeting nitrogen and other nutrient requirement.

Incidence of pests and diseases

Under the prevailing weather conditions, the following pests are expected in Bangalore on various horticultural crops. Their management options are mentioned below.

Fruit Crops

Mango

- Incidence of leaf hoppers is noticed in mango inflorescence. Spraying of imidachloprid 0.5 ml/l or fipronil 1ml/l is recommended.

Custard Apple

- In new flushes from pruned trees incidence of tea mosquito bug is noticed. Spraying of imidachloprid 0.5 ml/l or lambda cyhalothrin (0.003%)/ is recommended.

Vegetable Crops

Tomato

- Incidence of Tuta *absoluta* is noticed under polyhouse conditions. Spray spinosad 45 SC @ 0.25 ml/l

Bhendi/Okra

- Incidence of stem fly is noticed in younger plants, spraying with the dichlorovas 1 ml/l is recommended.

Cabbage

- Incidence of diamond back moth is noticed. Spraying with the diafenthiuran 0.5gm/l)is recommended.

Brinjal

- The incidence of brinjal shoot and fruit borer can be expected. Spraying of rynaxypyr@0.3 ml/l or flubendiamide@0.2 ml/l is recommended.

Bitter gourd

- Incidence of aphies is noticed and spraying of thiamethoxam 0.3gm/l is recommended.

Capsicum

- Thrips damage was noticed in the field. Spray imidacloprid @ 0.5 ml/l.

Floriculture

Gerbera

- Under polyhouse conditions thrips incidence is more. Spray spinosad@0.25ml/l.

Rose

- Thrips incidence is noticed on rose under polyhouse condition. Spray Fipronil 5 SC @ 1.5 ml/l. If the problem persists after one week also, sprays pinosad 45 SC @ 0.25 ml/l.

*Safe waiting periods are to be followed as per the label claims

Disease Scenario

Disease forecast based on weather parameters during the first fortnight of January, 2019.

Fruit Crops

Mango

- Powdery mildew requires attention. At this point of time application of wettable sulphur is **not advisable** because of high temperature. Anthracnose spots might further increase on foliage. Application of Mancozeb + Dinocap (Dikar) (0.3%) or Tridemorph (0.1%) or Hexaconazole (0.1%) is recommended for the disease management. Severity of Anthracnose spots might increase. Application of Difenconazole (0.05%) or Thiophanate methyl (0.1%) is recommended along with sticker @ 0.5 ml/ l.
- Sooty mould should be still taken care. Application of Copper oxychloride (0.3%) along with sticker (@ 0.5 ml / L) is recommended. Further hopper and other insect management is important with suitable insecticides (Imidacloprid @ 0.5%).

Papaya

- Infection of Black spot (*Asperisporium caricae*) may further increase. Whereas powdery mildew (*Oidium caricae*) infection may also be noticed. Application of Chlorothalonil (0.2%) Carbendazim (0.1%)/ Thiophanate methyl (0.1%)/ Hexaconazole (0.1%) along with the sticker @ 0.5ml/l with good coverage of the lower surface of the foliage is recommended.

Grape

- Anthracnose and Powdery mildew (*Uncinula necator*) infection may be noticed. For anthracnose application of Difenoconazole (0.05%)/ Thiophanate methyl (0.1%),/ Carbendzim + Mancozeb (0.2%) /Bitertanol (0.2%) whereas for powdery mildew Application of Azoxystrobin (0.1%) or Triadimefon (0.1%) along with sticker @ 0.5 ml/ l is recommended for the management of disease.
- Rust might continue to be noticed in grape vine orchards (var Bangalore Blue) and could be managed by the treatment with Chlorothalonil (0.2%) or Bitertanol (0.2%) or Dinocap (0.3%) + Mancozeb (2%) along with sticker @ 0.5 ml/ l.

Banana

- Sigatoka leaf spot (*Mycosphaerella* sp.), crown rot (*Fusarium moniliforme* & *Botryodiplodia theobromae*) and anthracnose (*Colletotrichum musae*) Macrophoma fruit spot disease needs proper attention. Sigatoka could be managed by spraying Carbendazim (0.1%) or Thiophanate methyl (0.1%) or Tridemorph (0.1%)/ whereas crown rot, anthracnose and Macrophoma fruit spot disease (Specially on var. Grand Naine) could be controlled by the pre-harvest sprays involving Carbendazim (0.1%) or Thiophanate methyl (0.1%), besides post-harvest dip in Chlorine water (300 ppm) for 10 minutes.
- Application of Hexaconazole + Zineb (0.2%) may be effective in case of **complex infection** of diseases as mentioned above.

Pomegranate

- Intensity of leaf and fruit spot disease caused by *Pseudocercospora punicae* and anthracnose of fruit and leaf (*C. gloeosporioides*) may increase further. Application of Chlorothalonil (0.2%) /Antracol (0.2%)/ Carbendazim (0.1%)/ Thiophanate methyl (0.1%)/ Hexaconazole (0.1%) along with the sticker @ 0.5ml/l is effective for the disease control.

Vegetables

- **Powdery mildew** incidence will be high in all vegetables (solaceous and cucurbitaceous). If temperature is not high wettable sulphur can be given. If temperature increases spraying of wettable sulphur should be avoided. Hexaconazole at 0.1% along with sticker 0.5ml/ l will be effective in controlling the powdery mildews in vegetables.
- **Anthracnose** in vegetables will increase especially in chillies. For anthracnose application of Difenoconazole (0.05%)/ Thiophanate methyl (0.1%)/ Carbendzim + Mancozeb (0.2%) /Bitertanol (0.2%) along with sticker 0.5ml/l will be effective.

Ornamentals

- **Powdery mildews** in rose and gerbera. Spraying azoxystrobin at 0.1% along with sticker 0.5ml/l will help in reducing powdery mildew spread under protected cultivation. In not spread extensively tebuconazole or hexaconazole at 0.1% with sticker also will help.

Virus diseases

- Change in weather especially low humidity with increase in temperature favours sucking pests which are vectors of many virus diseases. Seed treatment with imidacloprid or spray of acephate (0.2%) will be effective in controlling vector population.

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**CROP WEATHER SITUATION
METEOROLOGICAL DATA OF
ICAR-INDIAN INSTITUTE OF HORTICULTURAL RESEARCH
HESSARAGHATTA LAKE P.O., BANGALORE – 560 089**

Period: 16th to 31st January, 2019

Latitude: 13^o7¹ N

Longitude: 77^o 29¹E

Altitude: 890 M

Fortnight	Temperature (°C)		Relative Humidity (%)		Evaporation (mm)	Wind speed (km/h)	Total Rainfall (mm)
	Average Max.	Average Min.	Average at 7.30AM	Average at 1.30PM			
January 16 th to 31 st , 2019	29.2	11.8	86.4	39.1	4.5	3.85	1.0
	(28.3)	(15.4)	(75.3)	(42.2)	(4.0)	(3.0)	(0.0)

* Figures in the parentheses indicate the average values during the corresponding period for the previous 5 years

Fortnight from 16th to 31st January, 2019

During the second fortnight of the month i.e., from January 16th to 31st, 2019, the average maximum and minimum temperatures were higher by 0.3^oC and 4.4^oC respectively, as compared to the previous fortnight. The average maximum temperature was higher by 0.2^oC and minimum temperature was lower by 0.9^oC, respectively, as compared to the average values of the corresponding period for the previous five years. The percent relative humidity during morning and afternoon were higher by 1.9% and 11.4% respectively, as compared to the previous fortnight. There was 1.00 mm rainfall during the fortnight.

Crop weather situation

Average maximum temperature, wind speed and evaporation rates are slightly higher than the average values of previous 5 years. Basins of tree crops may be covered with available mulches to reduce evaporation and conserve moisture. Application of organic manures along with irrigation will increase the availability of nutrients to crops like mango. Mango special application through foliar spraying is recommended during this period. Temperature conditions of the second fortnight was suitable for Oyster mushroom cultivation.

Incidence of pests and diseases

Under the prevailing weather conditions, the following pests are expected in Bangalore on various horticultural crops. Their management options are mentioned below.

Fruit Crops

Mango

➤ Incidence of leaf hoppers is noticed in mango inflorescence. Spraying of imidachloprid 0.5 ml/l or fipronil 1 ml/l is recommended.

Custard Apple

➤ In new flushes from pruned trees incidence of tea mosquito bug is noticed. Spraying of imidachloprid 0.5 ml/l or lambda cyhalothrin (0.003%)/ is recommended.

Vegetable Crops

Tomato

➤ Incidence of *Tuta absoluta* is noticed under polyhouse conditions. Spray spinosad 45 SC @ 0.25 ml/l

Bhendi/Okra

- Incidence of aphids is noticed, spraying with the thiomethoxom 0.3g/l is recommended.

Cabbage

- Incidence of diamond back moth is noticed. Spraying with the diafenthiuran 0.5gm/l) is recommended.

Brinjal

- The incidence of brinjal shoot and fruit borer can be expected. Spraying of rynaxypyr@0.3 ml/l or flubendiamide@0.2 ml/l is recommended.

Bitter gourd

- Incidence of aphids is noticed and spraying of thiamethoxam 0.3gm/l is recommended.

Capsicum

- Thrips damage was noticed in the field. Spray imidacloprid @ 0.5 ml/l or fipronil 5 SC @ 1.5 ml/l is recommended.

Floriculture

Rose

- Thrips incidence is noticed on rose under polyhouse condition. Spray Fipronil 5 SC @ 1.5ml/l. If the problem persists after one week also, sprays spinosad 45 SC @ 0.25 ml/l.

Gerbera

- Under polyhouse conditions thrips incidence is more. Spray spinosad@0.25ml/l or acephate.

*Safe waiting periods are to be followed as per the label claims

Disease Scenario

Disease forecast based on weather parameters during the second fortnight of January, 2019.

Fruit Crops

Mango

- Powdery mildew requires attention. At this point of time application of wettable sulphur is **not advisable** because of high temperature. Anthracnose spots might further increase on foliage. Application of Mancozeb + Dinocap (Dikar) (0.3%) or Tridemorph (0.1%) or Hexaconazole (0.1%) is recommended for the disease management. Severity of Anthracnose spots might increase. Application of Difenconazole (0.05%) or Thiophanate methyl (0.1%) is recommended along with sticker @ 0.5 ml/ l.

Papaya

- Infection of Black spot (*Asperisporium caricae*) may further increase. Whereas powdery mildew (*Oidium caricae*) infection may also be noticed. Application of Chlorothalonil (0.2%) Carbendazim (0.1%)/ Thiophanate methyl (0.1%)/ Hexaconazole (0.1%) along with the sticker @ 0.5ml/l with good coverage of the lower surface of the foliage is recommended.

Grape

- Anthracnose and Powdery mildew (*Uncinula necator*) infection may be noticed. For anthracnose application of Difenconazole (0.05%)/ Thiophanate methyl (0.1%),/ Carbendzim + Mancozeb (0.2%) /Bitertanol (0.2%) whereas for powdery mildew Application of Azoxystrobin (0.1%) or Triadimefon (0.1%) along with sticker @ 0.5 ml/ l is recommended for the management of disease.
- Rust might continue to be noticed in grape vine orchards (var Bangalore Blue) and could be managed by the treatment with Chlorothalonil (0.2%) or Bitertanol (0.2%) or Dinocap (0.3%) + Mancozeb (2%) along with sticker @ 0.5 ml/ l.

Banana

- Sigatoka leaf spot (*Mycosphaerella* sp.), crown rot (*Fusarium moniliforme* & *Botryodiplodia theobromae*) and anthracnose (*Colletotrichum musae*) Sigatoka could be managed by spraying Carbendazim (0.1%) or Thiophanate methyl (0.1%) or Tridemorph (0.1%)/ whereas crown rot, anthracnose could be controlled by the pre-harvest sprays involving Carbendazim (0.1%) or Thiophanate methyl (0.1%), besides post harvest dip in Chlorine water (300 ppm) for 10 minutes.
- Application of Hexaconazole + Zineb (0.2%) may be effective in case of **complex infection** of diseases as mentioned above.

Pomegranate

- Intensity of leaf and fruit spot disease caused by *Pseudocercospora punicae* and anthracnose of fruit and leaf (*C. gloeosporioides*) may increase further. Application of Chlorothalonil (0.2%) /Antracol (0.2%)/ Carbendazim (0.1%)/ Thiophanate methyl (0.1%)/ Hexaconazole (0.1%) along with the sticker @ 0.5ml/l is effective for the disease control.

Vegetables

- **Powdery mildew** incidence will be high in all vegetables (solaceous and cucurbitaceous). If temperature is not high wettable sulphur can be given. If temperature increases spraying of wettable sulphur should be avoided. Hexaconazole at 0.1% along with sticker 0.5ml/ l will be effective in controlling the powdery mildews in vegetables.
- **Anthracnose** in vegetables will increase especially in chillies. For anthracnose application of Difenoconazole (0.05%)/ Thiophanate methyl (0.1%),/ Carbendzim + Mancozeb (0.2%) /Bitertanol (0.2%) along with sticker 0.5ml/l will be effective.

Ornamentals

- **Powdery** mildews in rose and gerbera. Spraying azoxystrobin at 0.1% along with sticker 0.5ml/l will help in reducing powdery mildew spread under protected cultivation. In not spread extensively tebuconazole or hexaconazole at 0.1% with sticker also will help.

Virus diseases

- Change in weather especially low humidity with increase in temperature favours sucking pests which are vectors of many virus diseases. Seed treatment with imidacloprid or spray of acephate (0.2%) will be effective in controlling vector population.

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**CROP WEATHER SITUATION
METEOROLOGICAL DATA OF
ICAR-INDIAN INSTITUTE OF HORTICULTURAL RESEARCH
HESSARAGHATTA LAKE P.O., BANGALORE – 560 089**

Period: 1st to 15th February, 2019

Latitude: 13^o7¹ N

Longitude: 77^o 29¹E

Altitude: 890 M

Fortnight	Temperature (°C)		Relative Humidity (%)		Evaporation (mm)	Wind speed (km/h)	Total Rainfall (mm)
	Average Max.	Average Min.	Average at 7.30AM	Average at 1.30PM			
February 1 st to 15 th , 2019	29.9	15.7	76.7	43.1	5.2	5.2	11.4
	(28.8)	(15.1)	(69.5)	(39.9)	(4.6)	(3.3)	(0.0)

* Figures in the parentheses indicate the average values during the corresponding period for the previous 5 years

Fortnight from 1st to 15th February, 2019

During the first fortnight of the month i.e., from February 1st to 15th, 2019, the average maximum and minimum temperatures were higher by 0.7^oC and 3.9^oC respectively, as compared to the previous fortnight. The average maximum temperature was higher by 0.5^oC and minimum temperature was lower by 0.3^oC, respectively, as compared to the average values of the corresponding period for the previous five years. The percent relative humidity during morning was lower by 9.7% and in the afternoon it was higher by 4.0% respectively, as compared to the previous fortnight. There was 11.4 mm rainfall during the fortnight.

Crop weather situation

Since the temperature is higher compared to the average temperature of same period during previous years, protective irrigation may be taken up and soil moisture is kept low to reduce sun scorching effect. Field preparation can be taken up for summer sowing of vegetables. Farmers are advised to mulch soil wherever possible. The weather condition of the last fortnight was suitable for the cultivation of Milky Mushroom and Paddy straw Mushroom.

Incidence of pests and diseases

Under the prevailing weather conditions, the following pests are expected in Bangalore on various horticultural crops. Their management options are mentioned below.

Fruit Crops

Mango

- Incidence of leaf hoppers is noticed in mango inflorescence. Spraying of imidachloprid 0.5 ml/l or fipronil 1 ml/l is recommended.

Custard Apple

- In new flushes from pruned trees incidence of tea mosquito bug is noticed. Spraying of imidachloprid 0.5 ml/l or lambda cyhalothrin (0.003%)/ is recommended.

Vegetable Crops

Bhendi/Okra

- Incidence of aphids and leaf hoppers is noticed, spraying with the thiochloprid @ 0.4 ml/l is recommended.

Drum Stick

- Incidence of leaf eating caterpillar is noticed and spraying with the spinosad @ 0.4 ml/l is recommended.

Brinjal

- The incidence of brinjal shoot and fruit borer can be expected. Spraying of rynaxypyr@0.3 ml/l or flubendiamide@0.2 ml/l is recommended.

Cabbage

- Incidence of diamond back moth is noticed. Spraying with the diafenthiuran 0.5gm/l)is recommended.

Tomato

- Incidence of *Tuta absoluta* is noticed under polyhouse conditions. Spray spinosad 45 SC @ 0.25 ml/l

Bitter gourd

- Incidence of aphies is noticed and spraying of thiamethoxam 0.3gm/l is recommended.

Cucumber

- Incidence of aphids and leaf hoppers is noticed, spraying with the thiochlorid @ 0.4 ml/l is recommended.

Floriculture

Rose

- Thrips incidence is noticed on rose under polyhouse condition. Spray Fipronil 5 SC @ 1.5 ml/l. If the problem persists after one week also, sprays pinosad 45 SC @ 0.25 ml/l.

Gerbera

- Under polyhouse conditions thrips incidence is more. Spray spinosad@0.25ml/l.

*Safe waiting periods are to be followed as per the label claims

Disease Scenario

Disease forecast based on weather parameters during the first fortnight of February, 2019. Increase in temperature increased the population built up of whiteflies. As whiteflies are vectors of begomoviruses, increase in incidence of leaf curl virus diseases in bitter gourd, ridge gourd, chilli and tomato was noticed. Preventive sprays of neem based insecticides @2.0 ML/Liter followed by systemic insecticides is recommended.

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**CROP WEATHER SITUATION
METEOROLOGICAL DATA OF
ICAR-INDIAN INSTITUTE OF HORTICULTURAL RESEARCH
HESSARAGHATTA LAKE P.O., BANGALORE – 560 089**

Period: 16th to 28th February, 2019

Latitude: 13^o7¹ N

Longitude: 77^o 29¹E

Altitude: 890 M

Fortnight	Temperature (°C)		Relative Humidity (%)		Evaporation (mm)	Wind speed (km/h)	Total Rainfall (mm)
	Average Max.	Average Min.	Average at 7.30AM	Average at 1.30PM			
February 16 th to 28 th , 2019	33.5	13.9	66.8	28.4	6.57	4.49	0.0
	(30.4)	(15.8)	(61.8)	(33.3)	(5.5)	(3.6)	(0.0)

Figures in the parentheses indicate the average values during the corresponding period for the previous 5 years

Fortnight from 16th to 28th February, 2019

During the second fortnight of the month i.e., from January 16th to 28th, 2019, the average maximum temperature was higher by 3.6^oC and the minimum temperature was lower by 1.8^oC respectively, as compared to the previous fortnight. The average maximum and minimum temperatures were higher by 1.6^oC and 0.7^oC, respectively, as compared to the average values of the corresponding period for the previous five years. The percent relative humidity during morning and afternoon were lower by 9.9% and 14.7% respectively, as compared to the previous fortnight. There was no rainfall during the fortnight.

Crop weather situation

The average maximum temperature during this period was higher than the average for the last five years. The evaporation was higher with no rainfall during the above period. Because of high evaporation rate and low rainfall supplemental irrigation may be given.

Incidence of pests and diseases

Under the prevailing weather conditions, the following pests are expected in Bangalore on various horticultural crops. Their management options are mentioned below.

Fruit Crops

Mango

Incidence of fruit flies is expected in early varieties. Setting up of methyl eugenol traps @ 15/ha is recommended.

Incidence of leaf hoppers is noticed in mango inflorescence. Spraying of imidachloprid 0.5 ml/l or fipronil 1 ml/l is recommended.

Guava

Incidence of tea mosquito bug is noticed spraying of lambda cyhalothrin @ 0.6 ml/l is recommended.

Custard Apple

In new flushes from pruned trees incidence of tea mosquito bug is noticed. Spraying of imidachloprid 0.5 ml/l or lambda cyhalothrin (0.003%)/ is recommended.

Vegetable Crops

Bhendi/Okra

Incidence of aphids and leaf hoppers is noticed, spraying with the thiochlorid @ 0.4 ml/l is recommended.

Drum Stick

Incidence of leaf eating caterpillar is noticed and spraying with the spinosad @ 0.4 ml/l is recommended.

Brinjal

The incidence of brinjal shoot and fruit borer can be expected. Spraying of rynaxypyr@0.3 ml/l or flubendiamide@0.2 ml/l is recommended.

Cabbage

Incidence of diamond back moth is noticed. Spraying with the diafenthuran 0.5gm/l) is recommended.

Tomato

Incidence of *Tuta absoluta* is noticed under polyhouse conditions. Spray spinosad 45 SC @ 0.25 ml/l

Bitter gourd

Incidence of aphies is noticed and spraying of thiamethoxam 0.3gm/l is recommended.

Cucumber

Incidence of aphids and leaf hoppers is noticed, spraying with the thiochlorid @ 0.4 ml/l is recommended.

Floriculture

Gerbera

Under polyhouse conditions thrips incidence is more. Spray spinosad@0.25ml/l.

Rose

Thrips incidence is noticed on rose under polyhouse condition. Spray Fipronil 5 SC @ 1.5 ml/l. If the problem persists after one week also, sprays pinosad 45 SC @ 0.25 ml/l.

*Safe waiting periods are to be followed as per the label claims

Disease Scenario

Disease forecast based on weather parameters during the second fortnight of February, 2019.

Fruit Crops

Mango

Powdery mildew requires attention. At this point of time application of wettable sulphur is **not advisable** because of high temperature. Anthracnose spots might further increase on foliage. Application of Mancozeb + Dinocap (Dikar) (0.3%) or Tridemorph (0.1%) or Hexaconazole (0.1%) is recommended for the disease management. Severity of Anthracnose spots might increase. Application of Difenconazole (0.05%) or Thiophanate methyl (0.1%) is recommended along with sticker @ 0.5 ml/l.

Sooty mould should be still taken care. Application of Copper oxychloride (0.3%) along with sticker (@ 0.5 ml / L) is recommended. Further hopper and other insect management is important with suitable insecticides (Imidacloprid @ 0.5%).

Grape

Anthracnose may be noticed. For anthracnose application of Difenoconazole (0.05%)/ Thiophanate methyl (0.1%),/ Carbendzim + Mancozeb (0.2%) /Bitertanol (0.2%) whereas for powdery mildew Application of Azoxystrobin (0.1%) or Triadimefon (0.1%) along with sticker @ 0.5 ml/ l is recommended for the management of disease. Rust might continue to be noticed in grape vine orchards (var Bangalore Blue) and could be managed by the treatment with Chlorothalonil (0.2%) or Bitertanol (0.2%) or Dinocap (0.3%) + Mancozeb (2%) along with sticker @ 0.5 ml/ l.

Vegetables

Anthracnose in vegetables will increase especially in chillies. For anthracnose application of Difenoconazole (0.05%)/ Thiophanate methyl (0.1%),/ Carbendzim + Mancozeb (0.2%) /Bitertanol (0.2%) along with sticker 0.5ml/l will be effective.

Virus diseases

Change in weather especially low humidity with increase in temperature favours sucking pests which are vectors of many virus diseases. Seed treatment with imidacloprid or spray of acephate (0.2%) will be effective in controlling vector population.

**CROP WEATHER SITUATION
METEOROLOGICAL DATA OF
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HESSARAGHATTA LAKE P.O., BANGALORE – 560 089**

Period: 1st to 15th March, 2019

Latitude: 13⁰7¹ N

Longitude: 77⁰ 29¹E

Altitude: 890 M

Fortnight	Temperature (°C)		Relative Humidity (%)		Evaporation (mm)	Wind speed (km/h)	Total Rainfall (mm)
	Average Max.	Average Min.	Average at 7.30AM	Average at 1.30PM			
March 1 st to 15 th , 2019	34.1	17.6	62.8	30.60	7.1	4.18	0
	(31.8)	(19.6)	(68.8)	(41.9)	(6.0)	(3.8)	(14.3)

* Figures in the parentheses indicate the average values during the corresponding period for the previous 5 years

Fortnight from 1st to 15th March, 2019

During the first fortnight of the month i.e., from March 1st to 15th, 2019, the average maximum and minimum temperatures were higher by 0.6⁰C and 3.7⁰C respectively, as compared to the previous fortnight. The average maximum and minimum temperatures were higher by 1.4⁰C and 3.8⁰C, respectively, as compared to the average values of the corresponding period for the previous five years. The percent relative humidity during morning was lower by 4.0% and in the afternoon it was higher by 2.2% respectively, as compared to the previous fortnight. There was no rainfall during the fortnight.

Crop weather situation

The average maximum and minimum temperatures were higher during this period when compared to the average for the last five years. This showed increase in diurnal temperature. The evaporation was higher with no rainfall during the above period. Because of high evaporation rate and low rainfall supplemental irrigation may be given. The meteorological data of the last fortnight was suitable for the cultivation of *calocybe indica*, *Macrocybe crassa* and *volvariella volvaceae*. Cultivation of *Pleurotus* and *Lentinula* spp. required additional cooling.

Incidence of pests and diseases

Under the prevailing weather conditions, the following pests are expected in Bangalore on various horticultural crops. Their management options are mentioned below.

Fruit Crops

Mango

- Incidence of fruit flies is noticed in early varieties. Setting up of para pheromone traps (methyl eugenol traps) @ 06/acre is recommended.
- Incidence of leaf hoppers is noticed in mango inflorescence. Spraying of imidachlopid 17.8 SC@ 0.5 ml/l or fipronil 1 ml/l is recommended.

Guava

- Incidence of fruit fly is noticed. Setting up of para pheromone traps (methyl eugenol traps) @ 06/acre is recommended.

Custard Apple

- Incidence of fruit fly is noticed. Setting up of para pheromone traps (methyl eugenol traps) @ 06/acre is recommended.

Vegetable Crops

Tomato

- Incidence of *Tuta absoluta* is noticed under polyhouse conditions. Spray spinosad 45 SC @ 0.25 ml/l.

Bhendi/Okra

- Incidence of aphids and leaf hoppers is noticed, spraying with the thiochlorid @ 0.4 ml/l is recommended.

Drum Stick

- Incidence of leaf eating caterpillar is noticed and spraying with lambda cyhalothrin (0.003%)/ is recommended.

Brinjal

- The incidence of brinjal shoot and fruit borer can be expected. Spraying of rynaxypyr@0.3 ml/l or flubendiamide@0.2 ml/l is recommended.

Cabbage

- Incidence of diamond back moth is noticed. Spraying with the diafenthiuran 0.5gm/l) is recommended. Alternatively, neem seed pellets (4%) or neem seed extract (4%) is ecofriendly.

Bitter gourd

- Incidence of aphids is noticed and spraying of thiamethoxam 0.3gm/l is recommended.

Cucumber

- Incidence of aphids and leaf hoppers is noticed, spraying with the thiochlorid @ 0.4 ml/l is recommended.

Capsicum

- Under polyhouse conditions thrips incidence is more. Spraying of the thiochlorid @ 0.4 ml/l is recommended.

Floriculture

Gerbera

- Under polyhouse conditions thrips incidence is more. Spray spinosad@0.25ml/l.

Rose

- Thrips incidence is noticed on rose under polyhouse condition. Spray Fipronil 5 SC @ 1.5 ml/l. If the problem persists after one week also, sprays spinosad 45 SC @ 0.25 ml/l.

*Safe waiting periods are to be followed as per the label claims

Disease Scenario

Disease forecast based on weather parameters during the first fortnight of March, 2019.

Fruit Crops

Mango

- Anthracnose spots might further increase on foliage. Application of Mancozeb + Dinocap (Dikar) (0.3%) or Tridemorph (0.1%) or Hexaconazole (0.1%) is recommended for the disease management. Severity of Anthracnose spots might increase. Application of Difenconazole (0.05%) or Thiophanate methyl (0.1%) is recommended along with sticker @ 0.5 ml/ l.

- Sooty mould should be still taken care. Application of Copper oxychloride (0.3%) along with sticker (@ 0.5 ml / L) is recommended. Further hopper and other insect management is important with suitable insecticides (Imidacloprid 17.8 SC @ 0.05%).

Grape

- Anthracnose infection may be noticed. For anthracnose application of Difenoconazole (0.05%)/ Thiophanate methyl (0.1%)/ Carbendzim + Mancozeb (0.2%) /Bitertanol (0.2%) along with sticker @ 0.5 ml/ l is recommended for the management of disease.

Vegetables

- **Anthracnose** in vegetables will increase especially in chillies. For anthracnose application of Difenoconazole (0.05%) / Thiophanate methyl (0.1%) / Carbendzim + Mancozeb (0.2%) / Bitertanol (0.2%) along with sticker 0.5ml/l will be effective.

Virus diseases

- Change in weather especially low humidity with increase in temperature favours sucking pests which are vectors of many virus diseases. Seed treatment with imidacloprid or spray of acephate (0.2%) will be effective in controlling vector population.

**CROP WEATHER SITUATION
METEOROLOGICAL DATA OF
ICAR-INDIAN INSTITUTE OF HORTICULTURAL RESEARCH
HESSARAGHATTA LAKE P.O., BANGALORE – 560 089**

Period: 16th to 31st March, 2019

Latitude: 13^o7¹ N

Longitude: 77^o 29¹E

Altitude: 890 M

Fortnight	Temperature (°C)		Relative Humidity (%)		Evaporation (mm)	Wind speed (km/h)	Total Rainfall (mm)
	Average Max.	Average Min.	Average at 7.30AM	Average at 1.30PM			
March 16 th to 31 st , 2019	35.1	18.2	67.0	28.0	7.9	4.7	0.0
	(33.8)	(19.7)	(70.4)	(43.1)	(6.1)	(3.2)	(10.8)

* Figures in the parentheses indicate the average values during the corresponding period for the previous 5 years

Fortnight from 16th to 31st March, 2019

During the second fortnight of the month i.e., from March 16th to 31st, 2019, the average maximum and minimum temperatures were higher by 1.0^oC and 0.6^oC respectively, as compared to the previous fortnight. The average maximum and minimum temperatures were higher by 2.0^oC and 0.1^oC, respectively, as compared to the average values of the corresponding period for the previous five years. The percent relative humidity during morning was higher by 4.2%, whereas during afternoon it was lower by 2.6% respectively, as compared to the previous fortnight. There was no rainfall during the fortnight.

Crop weather situation

When compare to previous fortnight, the average maximum temperature and minimum temperature has increased to the tune of 1^oC and 0.6 °C, respectively, and evaporation and wind speed were also increased and there was reduction in RH. The average maximum temperature during this period was higher and the average minimum temperature was lesser than the average for the last five years. The diurnal temperature difference has also increased and the evaporation was higher with no rainfall during the above period. Because of high evaporation rate and low rainfall supplemental irrigation may be given. The severe dry weather with higher diurnal variation in temperature coupled with lower humidity resulted in more fruit drop in crops like mango, guava and papaya. Incidence of scales was also noticed in crops like custard apple. The weather condition of second fortnight of March was suitable for the cultivation of Tropical species like *Calocybe indica*, *Volvariella volvaceae*. The new species *Macrocybe crassa* too showed better fructification.

Incidence of pests and diseases

Under the prevailing weather conditions, the following pests are expected in Bangalore on various horticultural crops. Their management options are mentioned below.

Fruit Crops

Mango

- Incidence of fruit flies is noticed in most of the varieties. Setting up of para pheromone traps (methyl eugenol traps) @ 06/acre is recommended.

Guava

- Incidence of fruit fly is noticed. Setting up of para pheromone traps (methyl eugenol traps) @ 06/acre is recommended.

Sapota

- Incidence of seed borer is noticed. Spraying with the DDVP 1 ml/l is recommended.

Custard Apple

- Incidence of fruit fly is noticed. Setting up of para pheromone traps (methyl eugenol traps) @ 06/acre is recommended.

Vegetable Crops

Bhendi/Okra

- Incidence of aphids, leaf hoppers and mits is noticed. For management aphids and leaf hoppers spraying with the thiochlorid @ 0.4 ml/l is recommended. For management of mids spraying with the spiromesifin 1 ml/l is recommended.

Drum Stick

- Incidence of leaf eating caterpillar is noticed and spraying with lambda cyhalothrin (0.003%)/ is recommended.

Brinjal

- The incidence of brinjal shoot and fruit borer can be expected. Spraying of rynaxypyr@0.3 ml/l or flubendiamide@0.2 ml/l is recommended.

Cabbage

- Incidence of diamond back moth is noticed. Spraying with the diafenthiuran 0.5gm/l) is recommended.

Tomato

- Incidence of *Tuta absoluta* is noticed under polyhouse conditions. Spray spinosad 45 SC @ 0.25 ml/l.

Bitter gourd

- Incidence of aphids is noticed and spraying of thiamethoxam 0.3gm/l is recommended.

Cucumber

- Incidence of aphids and leaf hoppers is noticed, spraying with the thiochlorid @ 0.4 ml/l is recommended.

Capsicum

- Under polyhouse conditions thrips incidence is more. Spraying of the thiochlorid @ 0.4 ml/l is recommended.

Floriculture

Gerbera

- Under polyhouse conditions thrips incidence is more. Spray spinosad@0.25ml/l.

Rose

- Thrips incidence is noticed on rose under polyhouse condition. Spray Fipronil 5 SC @ 1.5 ml/l. If the problem persists after one week also, spray spinosad 45 SC @ 0.25 ml/l. Drenching the soil with the chloropyriphos @ 2 ml/l is recommended

*Safe waiting periods are to be followed as per the label claims

Disease Scenario

Disease forecast based on weather parameters during the second fortnight of March, 2019.

Fruit Crops

Mango:

- Anthracnose spots might further increase on foliage. Application of Mancozeb + Dinocap (0.3%) or Tridemorph (0.1%) or Hexaconazole (0.1%) is recommended for the disease management. Severity of Anthracnose spots might increase. Application of Difenconazole (0.05%) or Thiophanate methyl (0.1%) is recommended along with sticker @ 0.5 ml/l.
- Sooty mould should be still taken care. Application of Copper oxychloride (0.3%) along with sticker (@ 0.5 ml / L) is recommended. Further hopper and other insect management is important with suitable insecticides (Imidacloprid @ 0.5%).

Grape:

- Anthracnose infection may be noticed. For anthracnose application of Difenconazole (0.05%)/ Thiophanate methyl (0.1%) / Carbendzim + Mancozeb (0.2%) /Bitertanol (0.2%) along with sticker @ 0.5 ml/l is recommended for the management of disease.

Vegetables:

- **Anthracnose** in vegetables will increase especially in chillies. For anthracnose application of Difenconazole (0.05%)/ Thiophanate methyl (0.1%),/ Carbendzim + Mancozeb (0.2%) /Bitertanol (0.2%) along with sticker 0.5ml/l will be effective.

Virus diseases:

- Change in weather especially low humidity with increase in temperature favours sucking pests which are vectors of many virus diseases. Seed treatment with imidacloprid or spray of acephate (0.2%) will be effective in controlling vector population.

**CROP WEATHER SITUATION
METEOROLOGICAL DATA OF
ICAR-INDIAN INSTITUTE OF HORTICULTURAL RESEARCH
HESSARAGHATTA LAKE P.O., BANGALORE – 560 089**

Period: 1st to 15th April, 2019

Latitude: 13^o7¹ N

Longitude: 77^o 29¹E

Altitude: 890 M

Fortnight	Temperature (°C)		Relative Humidity (%)		Evaporation (mm)	Wind speed (km/h)	Total Rainfall (mm)
	Average Max.	Average Min.	Average at 7.30AM	Average at 1.30PM			
April 1 st to 15 th , 2019	35.7	20.0	68.5	29.1	7.63	4.1	12.9
	(33.0)	(20.1)	(70.7)	(40.8)	(5.8)	(4.4)	(8.8)

* Figures in the parentheses indicate the average values during the corresponding period for the previous 5 years

Fortnight from 1st to 15th April, 2019

During the first fortnight of the month i.e., from April 1st to 15th, 2019, the average maximum and minimum temperatures were higher by 0.6^oC and 1.8^oC respectively, as compared to the previous fortnight. The average maximum temperature was lower by 0.8^oC and minimum temperature was higher by 0.4^oC, respectively, as compared to the average values of the corresponding period for the previous five years. The percent relative humidity during morning and afternoon were higher by 1.5% and 1.1% respectively, as compared to the previous fortnight. There was 12.9mm rainfall during the fortnight.

Crop weather situation

When compared to the last fortnight, the average maximum temperature and minimum temperature had increased to the extent of 1.6^oC and 2.4^oC, respectively. Also the average maximum temperature had increased to the tune of 2.7^oC over the previous 5 years. The total rainfall during this period was 12.9 mm and higher evaporation rate of 7.63 mm was recorded. Because of high evaporation rate and low rainfall supplemental irrigation may be given. During the period, premature fruit drop was noticed in crops like guava, mango etc.

Incidence of pests and diseases

Under the prevailing weather conditions, the following pests are expected in Bangalore on various horticultural crops. Their management options are mentioned below.

Fruit Crops

Mango stone weevil management

- Wherever fruits reached lemon size (2-4 cm diameter), a spray of acephate @ 1.5g/L followed after two weeks by deltamethrin @ 1ml/L. This will also take care of thrips incidence on fruits which is becoming serious in some parts with rising temperatures.

Fruit fly Management

- Collect and destroy fallen fruits.
- In orchards where fruit set occurred early and they attained full size, erect methyl eugenol based fruit fly traps @ 6/acre.

Mealy bugs on grapes:

- Incidence of mealybugs may increase during this period.

- Encourage natural enemies such as lady bird beetle. If incidence is higher than spray difenthiuron 50 WP 1g/liter and repeat the spray after 2 weeks.

Vegetable Crops

Leaf miner on tomato

- Incidence of leaf miner is observed on tomato. For its management spray indoxacarb 14.5 SC @ 0.75 ml/liter or spinosad 45SC @ 0.3ml/l

Whiteflies on tomato:

- Incidence of whiteflies is noticed on tomato. For their management spray difenthiuron 50 WP 1g/liter

Mites on tomato and Ridge gourd

- Rising temperatures favour mite multiplication. For the management of mites on tomato and ridge gourd, spray spiromesifen 22.9SC @ 1ml/L or fenazaquin 10EC 1.5ml/L at fortnight interval.

Serpentine leaf miner on cucurbits

- Spray neem soap @ 10g/L mix with cypermethrin 10 EC (1ml/L)
- Spray neem seed powder extract 40g/liter

Brinjal shoot and fruit borer

- For the management of brinjal shoot and fruit borer, spray Rynaxypyr 20 SC @ 0.3 ml/l rotate with Emamectin benzoate 5 SG @ 0.3g/liter followed by indoxacarb @ 0.75 ml/liter.

Floriculture

Thrips on rose

- For the management of thrips on rose, spray Imidacloprid @ 0.5 ml/l or fipronil 5 SC @ 1.5ml/liter.

*Safe waiting periods are to be followed as per the label claims

Disease Scenario

Disease forecast based on the weather data for first fort night of April 2019

Fruit Crops

Mango

- Anthracnose spots might further increase on foliage. Application of Hexaconazole (0.1%) is recommended for the disease management. Severity of Anthracnose spots might increase. Application of Difenconazole (0.05%) or Thiophanate methyl (0.1%) is recommended along with sticker @ 0.5 ml/ l.
- Sooty mould should be still taken care. Application of Copper oxychloride (0.3%) along with sticker (@ 0.5 ml / L) is recommended. Further hopper and other insect management is important with suitable insecticides (Imidacloprid @ 0.5%).

Pomegranate

- After having the crop in the earlier months when the farmers are giving rest period, that time also one spray of copper based fungicides is recommended to avoid the spread of bacterial blight that can increase after summer showers.

Vegetables

- **Anthracnose** in vegetables will increase especially in chillies. For anthracnose application of Difenoconazole (0.05%)/ Thiophanate methyl (0.1%),/ Carbendzim + Mancozeb (0.2%) /Bitertanol (0.2%) along with sticker 0.5ml/l will be effective.

Nursery/ seedlings

- In nursery the preventive spray with neem soap or neem oil is recommended to avoid the virus vectors that transmit the virus disease. One spray of systemic insecticide also will help.

Virus diseases

- Change in weather especially low humidity with increase in temperature favours sucking pests which are vectors of many virus diseases. Seed treatment with imidacloprid or spray of acephate (0.2%) will be effective in controlling vector population.

**CROP WEATHER SITUATION
METEOROLOGICAL DATA OF
ICAR-INDIAN INSTITUTE OF HORTICULTURAL RESEARCH
HESSARAGHATTA LAKE P.O., BANGALORE – 560 089**

Period: 16th to 30th April, 2019

Latitude: 13^o7¹ N

Longitude: 77^o 29¹E

Altitude: 890 M

Fortnight	Temperature (°C)		Relative Humidity (%)		Evaporation (mm)	Wind speed (km/h)	Total Rainfall (mm)
	Average Max.	Average Min.	Average at 7.30AM	Average at 1.30PM			
April 16 th to 30 th	35.3	20.8	71.3	38.4	6.89	4.4	15.8
April, 2019	(34.0)	(21.3)	(72.1)	(40.6)	(5.7)	(3.4)	(14.1)

* Figures in the parentheses indicate the average values during the corresponding period for the previous 5 years

Fortnight from 16th to 30th April, 2019

During the second fortnight of the month i.e., from April 16th to 30th, 2019, the average maximum temperature was lower by 0.4^oC and minimum temperatures was higher by 0.8^oC respectively, as compared to the previous fortnight. The average maximum and minimum temperatures were higher by 1.0^oC and 1.2^oC respectively, as compared to the average values of the corresponding period for the previous five years. The percent relative humidity during morning and afternoon were higher by 2.8% and 9.3% respectively, as compared to the previous fortnight. There was 15.8 mm rainfall during the fortnight.

Crop weather situation

When compare to previous fortnight, the average minimum temperature has increased to the tune 0.8^oC and maximum temperature has reduced 0.4^oC, respectively, and evaporation rate has reduced due to increase in rainfall. Wind speed and RH were also increased. The average maximum and minimum temperature during this period was higher than the average of the same in the last five years. The diurnal temperature difference is also increased and the evaporation was higher with high wind speed. Because of increase in temperature and evaporation rate supplemental irrigation may be given. During the period, premature softening and dropping of nearly matured fruits was observed in mango as well as in guava. The weather condition was suitable for the cultivation of Tropical species like *Calocybe indica*, *Macrocybe crassa* and *Volvariella species*.

Incidence of pests and diseases

Under the prevailing conditions, the following pests are expected under Bangalore condition. Expected pests and their management are presented below.

Fruit Crops

Mango fruit fly

- As the fruits had attained maturity stage, incidence of fruit fly is expected.

- Install methyl eugenol traps @ 6 /acre. Traps can be procured from IIHR or KVKs or firms licensed to manufacture IIHR traps.
- Collection and destruction of fallen fruits
- Bait splash on tree trunks with 10% jaggery solution mixed with deltamethrin
- Community approach at village level is recommended for the effective management of this pest

Grapes Flea Beetle

- Incidence of flea beetle is expected on newly pruned vines.
- Remove all loose bark
- Rake the soil in basin to expose grubs and pupae to sunlight
- At early bud sprout –spray of imidacloprid 200 SL @ 0.3ml/L or Lambda-cyhalothrin 5 EC @ 0.5ml/L

Grape thrips

- On newly pruned grapes, thrips infestation on leaves is expected.
- Spray *Metarhizium anisopliae* formulation @ 2ml/L two times at weekly interval or fipronil 5SC @ 1.5 ml/L twice at fortnightly interval

Vegetable Crops

Brinjal shoot and fruit borer

- Release of *Trichogramma chilonis* @ 75,000 per week (for four weeks), if the incidence is moderate.
- Install pheromones traps in the field
- If the incidence is very severe, for the management of brinjal shoot and fruit borer, spray Rynaxypyr 20 SC @ 0.3 ml/l rotate with Emamectin benzoate 5 SG @ 0.3g/liter followed by indoxacarb 14.5 SC @ 0.75 ml/litre.

Mites on tomato and Ridge gourd

- Rising temperatures favour mite multiplication. For the management of mites, spray spiromesifen 22.9SC @ 0.5ml/L or fenazaquin 10 EC @ 1.5ml/L at fortnight interval.

Thrips, *Scirtothrips dorsalis* on chilli

- Incidence of thrips may increase on chilli and capsicum. For its management, spray fipronil 5SC @ 1.5 ml/l or spinetoram 11.7 SC@ 1ml/litre or spinosad 45 SC @ 0.5ml/litre alternating with imidacloprid 200 SL @ 0.5 ml/l at fortnightly interval if the crop is at early stage of infestation. Addition of 2 ml of neem oil or pongamia oil per every liter of insecticide spray solution enhances the efficacy of the chemicals against the pest.

Two spotted spider mite, *Tetranychus urticae* on rose

- During the period, severe incidence of mites is observed on roses grown under polyhouse conditions. Spray abamectin @ 0.5 ml/l or fenazaquin 10 EC @ 1.5ml/L at fortnight interval for their management

Disease Scenario

Disease forecast based on weather parameters during the second fortnight of April, 2019.

Fruit Crops

Mango

- Anthracnose spots might further increase on foliage. Application of Mancozeb + Dinocap (0.3%) or Tridemorph (0.1%) or Hexaconazole (0.1%) is recommended for the disease management. Severity of Anthracnose spots might increase. Application of Difenconazole (0.05%) or Thiophanate methyl (0.1%) is recommended along with sticker @ 0.5 ml/ l.
- Sooty mould should be still taken care. Application of Copper oxychloride (0.3%) along with sticker (@ 0.5 ml / L) is recommended. Further hopper and other insect management is important with suitable insecticides (Imidacloprid @ 0.5%).

Pomegranate

- After having the crop in the earlier months when the farmers are giving rest period, that time also one spray of copper based fungicides is recommended to avoid the spread of bacterial blight that can increase after summer showers.

Grape

- Anthracnose infection may be noticed. For anthracnose application of Difenconazole (0.05%)/ Thiophanate methyl (0.1%) / Carbendzim + Mancozeb (0.2%) /Bitertanol (0.2%) along with sticker @ 0.5 ml/ l is recommended for the management of disease.

Vegetables

- Anthracnose in vegetables will increase especially in chillies. For anthracnose application of Difenconazole (0.05%)/ Thiophanate methyl (0.1%),/ Carbendzim + Mancozeb (0.2%) /Bitertanol (0.2%) along with sticker 0.5ml/l will be effective.

Nursery/ seedlings:

- In nursery the preventive spray with neem soap or neem oil is recommended to avoid the virus vectors that transmit the virus disease. One spray of systemic insecticide also will help.

Virus diseases

- Change in weather especially low humidity with increase in temperature favours sucking pests which are vectors of many virus diseases. Seed treatment with imidacloprid or spray of acephate (0.2%) will be effective in controlling vector population.

**CROP WEATHER SITUATION
METEOROLOGICAL DATA OF
ICAR-INDIAN INSTITUTE OF HORTICULTURAL RESEARCH
HESSARAGHATTA LAKE P.O., BANGALORE – 560 089**

Period: 1st to 15th May, 2019

Latitude: 13^o7¹ N

Longitude: 77^o 29¹E

Altitude: 890 M

Fortnight	Temperature (°C)		Relative Humidity (%)		Evaporation (mm)	Wind speed (km/h)	Total Rainfall (mm)
	Average Max.	Average Min.	Average at 7.30AM	Average at 1.30PM			
May 1 st to 15 th , 2019	34.8	21.9	77.3	44.1	7.02	5.32	41.9
	(32.3)	(20.6)	(75.5)	(48.1)	(4.7)	(2.8)	(65.9)

* Figures in the parentheses indicate the average values during the corresponding period for the previous 5 years

Fortnight from 1st to 15th May, 2019

During the first fortnight of the month i.e., from May 1st to 15th, 2019, the average maximum temperature was lower by 0.5^oC and minimum temperature were higher by 1.1^oC respectively, as compared to the previous fortnight. The average maximum temperature and minimum temperature were lower by 1.7^oC and 0.7^oC respectively, as compared to the average values of the corresponding period for the previous five years. The percent relative humidity during morning and afternoon were higher by 6% and 5.7% respectively, as compared to the previous fortnight. There was 41.9mm rainfall during the fortnight.

Crop weather situation

The meteorological data for the first fortnight shows very dry spell with higher temperatures, lower rainfall, high wind speed and higher evaporation rate compared to the average value of previous 5 years. For standing crops like banana, supplemental irrigation may be given to make plantations to cope up with high temperatures. The less rain fall may be good for the quality of mango. In acidic soils liming may be done and incorporated into the soil. During the period, Wilt severe in pomegranate was noticed. Suitable for the cultivation of tropical species like *Calocybe indica*, *Macrocybe crassa*, *Volvariella* species. *Hypsizyugus ulmarius* could be grown in evaporative cooling chambers with reduce bio efficiency.

Incidence of pests and diseases

Under the prevailing weather conditions, the following pests were observed in Bangalore on various horticultural crops during first fortnight of May, 2019. Pest management options are mentioned below.

Fruit Crops

Mango fruit fly

- As the fruits had attained maturity stage, incidence of fruit fly is expected.
- Install methyl eugenol traps @ 6 /acre. Traps can be procured from IIHR or KVKs or firms licensed to manufacture IIHR traps.
- Collection and destruction of fallen fruits

- Bait splash on tree trunks with 10% jaggery solution mixed with deltamethrin
- Community approach at village level is recommended for the effective management of this pest
- Incidence of leaf hoppers is noticed in mango inflorescence. Spraying of imidachloprid 0.5 ml/l or fipronil 1 ml/l is recommended.

Guava

- Incidence of fruit fly is noticed. Setting up of para pheromone traps (methyl eugenol traps) @ 06/acre is recommended.

Grape thrips

- On newly pruned grapes, thrips infestation on leaves is expected.
- Spray *Metarhizium anisopliae* formulation @ 2ml/L two times at weekly interval or fipronil 5SC @ 1.5 ml/L twice at fortnightly interval.

Custard Apple:

- Incidence of fruit fly is noticed. Setting up of para pheromone traps (methyl eugenol traps) @ 06/acre is recommended.

Vegetable Crops

Bhendi /Okra:

- Incidence of aphids and leaf hoppers is noticed, spraying with the thiochloprid @ 0.4 ml/l is recommended

Drum Stick:

- Incidence of leaf eating caterpillar is noticed and spraying with lambda cyhalothrin (0.003%)/ is recommended.

Brinjal shoot and fruit borer

- Release of *Trichogramma chilonis* @ 75,000 per week (for four weeks), if the incidence is moderate.
- Install pheromones traps in the field
- If the incidence is very severe, for the management of brinjal shoot and fruit borer, spray Rynaxypyr 20 SC @ 0.3 ml/l rotate with Emamectin benzoate 5 SG @ 0.3g/liter followed by indoxacarb 14.5 SC @ 0.75 ml/litre.

Tomato:

- Incidence of *Tutaabsolutais* noticed under polyhouse conditions. Spray spinosad 45 SC @ 0.25 ml/l

Mites on tomato and Ridge gourd

- Rising temperatures favour mite multiplication. For the management of mites, spray spiromesifen 22.9SC @ 0.5ml/L or fenazaquin 10 EC @ 1.5ml/L at fortnight interval.

Bitter gourd:

- Incidence of aphids is noticed and spraying of thiamethoxam 0.3gm/l is recommended.

Cucumber:

- Incidence of aphids and leaf hoppers is noticed, spraying with the thiochlorid @ 0.4 ml/l is recommended.

Gerbera:

- Under polyhouse conditions thrips incidence is more. Spray spinosad@0.25ml/l.

Capsicum:

- Under polyhouse conditions thrips incidence is more. Spraying of the thiochlorid @ 0.4 ml/l is recommended.

Rose:

- Thrips incidence is noticed on rose under polyhouse condition. Spray Fipronil 5 SC @ 1.5 ml/l. If the problem persists after one week also, spray spinosad 45 SC @ 0.25 ml/l.

*Safe waiting periods are to be followed as per the label claims

Disease Scenario

Disease forecast based on the weather data for first fortnight of May 2019

Fruit crops

Mango

- Anthracnose (*C. gloeosporioides*) and stem end rot (*L. theobromae*) occur in mango fruits during ripening. Pre-harvest sprays with Carbendazim (0.1%) or Thiophanate methyl (0.1%) followed by post-harvest treatments with Hot water (52°C) for ten minutes may be followed. Care should be taken that at the time of spraying there should be minimum of 15-20 day time is there before harvest.

Grape

- Anthracnose: spraying with Propineb (0.2%)/ Chlorothalonil (0.2%)/Carbendazim (0.1%)/ Thiophanate methyl (0.1%) are effective along with sticker @ 0.5 ml/ l.

Pomegranate

- Nodal Blight needs further attention due to the intermittent summer showers. Application of COC (0.2%) + Streptocycline (300 ppm) /l along with the sticker @ 0.5ml/l should be applied at the interval of 15 – 20 days.

Banana:

- Low incidence of Sigatoka (*Mycosphaerella* sp) and other leaf spots needs attention. The disease can be managed by the application of with Carbendazim (0.1%) or Thiophanate methyl (0.1%) whereas crown rot, anthracnose and Macrophoma fruit spot disease (Specially on var. Grand Naine) could be controlled by the pre-harvest sprays involving Carbendazim (0.1%) or Thiophanate methyl (0.1%), besides post-harvest dip in Chlorine water (300 ppm) for 10 minutes.

Papaya

- Infection of Anthracnose (*C. gloeosporioides*), Black spot (*Asperisporium caricae*) may further increase. Application of Chlorothalonil (0.2%) Carbendazim (0.1%)/ Thiophanate methyl (0.1%)/ Hexaconazole (0.1%) along with the sticker @ 0.5ml/l with good coverage of the lower surface of the foliage is recommended.

**CROP WEATHER SITUATION
METEOROLOGICAL DATA OF
ICAR-INDIAN INSTITUTE OF HORTICULTURAL RESEARCH
HESSARAGHATTA LAKE P.O., BANGALORE – 560 089**

Period: 16th to 31st May, 2019

Latitude: 13^o7¹ N

Longitude: 77^o 29¹E

Altitude: 890 M

Fortnight	Temperature (°C)		Relative Humidity (%)		Evaporation (mm)	Wind speed (km/h)	Total Rainfall (mm)
	Average Max.	Average Min.	Average at 7.30AM	Average at 1.30PM			
May 16 th to 31 st , 2019	33.91	21.53	80.13	50.88	5.71	3.76	111.6
	(33.1)	(21.1)	(77.8)	(49.5)	(5.2)	(3.3)	(88.8)

* Figures in the parentheses indicate the average values during the corresponding period for the previous 5 years

Fortnight from 16th to 31st May, 2019

During the Second fortnight of the month i.e., from May 16th to 31st, 2019, the average maximum temperature and minimum temperature were lower by 0.9°C and 0.4°C, respectively, as compared to the previous fortnight. The average maximum temperature and minimum temperature were higher by 0.8°C and 0.5°C, respectively, as compared to the average values of the corresponding period for the previous five years. The percent relative humidity during morning and afternoon were higher by 2.8% and 6.7% respectively, as compared to the previous fortnight. There was 111.6mm rainfall during the fortnight.

Crop weather situation

When compare to previous fortnight, the average maximum temperature has increased to the tune of 0.89°C and the average minimum temperature has decreased 0.37°C, respectively, and evaporation rate and wind speed decreased and RH increased. The average maximum and the average minimum temperatures during this period were slightly higher than the averages for the last five years. The diurnal temperature difference has also slightly increased and rainfall, evaporation rate and wind speed were higher during the period when compared to the average corresponding values of last five years. the weather conditions of second fortnight of May 2019 were highly suitable for the cultivation of *Calocybe indica* (Milky mushroom) and *Macrocybe gigantea*. Oyster mushroom (*Pleurotus* spp.) could be grown under evaporative cooling system under the shade.

Incidence of pests and diseases

Under the prevailing weather conditions, the following pests were observed in Bangalore on various horticultural crops during Second fortnight of May, 2019. Pest management options are mentioned below,

I. Fruit Crops:

Mango stem borer

- This period coincides with the emergence of adult beetles of trunk borer, *Batocera rufomaculata*. Plug active holes (can be diagnosed with the presence of fresh hewed wood

material and excreta) with cotton dipped in dichlorovos @ 5ml/L and close with mud. Affected tree trunks can be wrapped with nylon mesh to trap the emerging beetles

II. Vegetable crops:

Fruit fly on cucurbits

- For the management of fruit fly (*Bactrocera cucurbitae*) on cucurbits, following integrated approach may be followed. Installing cue lure traps @ 10 traps/acre + Sanitation (complete destruction of infested fruits at each harvest) + Bait spray (Deltamethrin 0.1 % + jaggery @ 10g/L) at 10 days interval from the date of flowering.

Chilli Thrips

- Spray fipronil 5SC (1.5 ml/l) or imidacloprid 200 SL (0.3 ml/l) alternately at fortnightly interval

Root-knot nematode in tomato

- Raise healthy seedlings on soil applied with FYM or vermicompost @5 tons/ha enriched with *Trichoderma harzianum* @ 2kg + *Paecilomyces lilacinus* @ 2kg + *Pseudomonas fluorescens* @2kg /ton of FYM.
- In standing crop, apply neem cake enriched with above biopesticides @ 50g/ m². This can also be mixed with water and applied as soil drench @ 2l/m². The same can be thoroughly filtered and sent along with drip or sprayed.

III. Ornamental crops:

Whitefly on Gerbera (polyhouse)

- Spray diafenthiuran @ 1 g/l followed by dinetofuran 1g/litre
- Install yellow sticky traps coated with adhesive or sticky glue at crop canopy level for monitoring adult whitefly population

Rose Thrips

- Spray imidacloprid 17.8 ml/l or dimethoate 30 EC @ 2ml/l with pongamia oil 0.5%.
- Apply Fipronil 5 SC @ 1.5 ml/l in case of severe infestations.
- Drench the soil with Chlorpyrifos 20 EC @ 5ml/l for killing pupae in the soil.

Midge on crossandra

- Incidence of midge is increasing on crossandra. For its management spray imidacloprid @ 0.5 ml/l.

Disease Scenario

Disease forecast based on the weather data for second fortnight of May 2019

I. Fruit crops

Mango

- Anthracnose (*C. gloeosporioides*) and stem end rot (*L. theobromae*) occur in mango fruits during ripening. Pre-harvest sprays with Carbendazim (0.1%) or Thiophanate methyl (0.1%) followed by post-harvest treatments with Hot water (52°C) for ten minutes may be followed.

Grape

- Grapevines should be continued to be protected against the infection of (i) downy mildew: by the application of 0.4g Dimethomorph + 2.00 g Mancozeb /l or Metalaxyl + Mancozeb (0.2%)/ Al Fosetyl (0.2%) along with sticker @ 0.5 ml/ l. Lower surface of the leaves on the vines to be sprayed properly (ii) anthracnose: spraying with Propineb (0.2%)/ Chlorothalonil (0.2%)/Carbendazim (0.1%)/ Thiophanate methyl (0.1%) are effective along with sticker @ 0.5 ml/ l.

Pomegranate

- Intensity of leaf and fruit spot disease caused by *Pseudocercospora punicae* and anthracnose of fruit and leaf (*C. gloeosporioides*) may increase further. Application of Chlorothalonil (0.2%) /Antracol (0.2%)/ Carbendazim (0.1%)/ Thiophanate methyl (0.1%)/ Hexaconazole (0.1%) along with the sticker @ 0.5ml/l is effective for the disease control.
- Nodal Blight needs further attention. With the pre-monsoon showers, blight incidence will increase. Application of COC (0.2%) + bononopal 0.5g/l along with the sticker @ 0.5ml/l should be applied at the interval of 15 – 20 days. Preventive sprays of plant health promoters like Arka Microbial consortium or Arka Actinoplus would help in better plant growth and there by induced resistance.

Banana

- Low incidence of Sigatoka (*Mycosphaerella* sp) and other leaf spots needs attention. The disease can be managed by the application of with Carbendazim (0.1%) or Thiophanate methyl (0.1%) whereas crown rot, anthracnose and Macrophoma fruit spot disease (Specially on var. Grand Naine) could be controlled by the pre-harvest sprays involving Carbendazim (0.1%) or Thiophanate methyl (0.1%), besides post harvest dip in salt water (300 ppm) for 10 minutes

Papaya

- Infection of Anthracnose (*C. gloeosporioides*), Black spot (*Asperisporium caricae*) may further increase. Application of Chlorothalonil (0.2%) Carbendazim (0.1%)/ Thiophanate methyl (0.1%)/ Hexaconazole (0.1%) along with the sticker @ 0.5ml/l with good coverage of the lower surface of the foliage is recommended.

Guava:

- Canker (*Pestalotiopsis psidi*) in greenish immature guava fruits and styler end rot (*Phomopsis psidi*) and anthracnose (*C. gloeosporioides*) should be taken care. For the disease management application of Zineb (0.3%) or Ziride (0.4%) followed with Carbendazim (0.1%)/ Thiophanate methyl (0.1%)/ along with sticker (0.5 ml /l) should be followed.

II. Vegetable Crops

Tomato

- To prevent the early leaf blight disease free seedlings are to be used. Seed treatment with captan or thiram (3g per kg of seeds) or seedling dip with copper oxy chloride (0.3%) also protects plants from various soil borne pathogens. It is the time for the protective sprays of contact fungicides like mancozeb, copper oxychloride or chlorothalanil on tomato to avoid

early leaf blight. In case of serious spread due to rain splash follow up spray with propineb (0.2%) or metiram (0.2%) or pyraclostrobin + metiram (0.2%) at fortnightly interval.

Onion

- To avoid the purple blotch and Stemphyllum leaf blight application of fungicides such as Chlorothalonil (0.2 %) or Propineb (0.2 %) or Mancozeb (0.2%) at fortnightly intervals from onset of the disease will be useful

Cucurbits

- To avoid the spread of downy mildew spraying Chlorothalonil (0.2%) or Mancozeb(0.2%) or Metalaxyl -Mancozeb(0.2%) or Fosetyl-AI (0.2%) or Cymoxanil- mancozeb(0.2%) 10-day intervals from onset of the disease.

Viral diseases in tomato and chilli

- To avoid the spread of viral diseases spraying insecticides like Monocrotophos (0.15%), Acephate (0.15%) or Hostothion (0.1 %) at fortnightly intervals after transplanting till flowering stage to control the vectors

**CROP WEATHER SITUATION
METEOROLOGICAL DATA OF
ICAR-INDIAN INSTITUTE OF HORTICULTURAL RESEARCH
HESSARAGHATTA LAKE P.O., BANGALORE – 560 089**

Period: 1st to 15th June, 2019

Latitude: 13⁰7¹ N

Longitude: 77⁰ 29¹E

Altitude: 890 M

Fortnight	Temperature (°C)		Relative Humidity (%)		Evaporation (mm)	Wind speed (km/h)	Total Rainfall (mm)
	Average Max.	Average Min.	Average at 7.30AM	Average at 1.30PM			
June 1 st to 15 th , 2019	31.1	21.5	84.9	64.9	6.56	4.84	85.9
	(30.4)	(21.0)	(77.6)	(53.8)	(4.6)	(4.7)	(47.9)

* Figures in the parentheses indicate the average values during the corresponding period for the previous 5 years

Fortnight from 1st to 15th June, 2019

During the first fortnight of the month i.e., from June 1st to 15th, 2019, the average maximum and minimum temperatures were lower by 2.8°C and 2.7°C respectively, as compared to the previous fortnight. There is no change in average maximum temperature and minimum temperature was lower by 0.1°C, as compared to the average values of the corresponding period for the previous five years. The percent relative humidity during morning and afternoon were higher by 4.8% and 14.1% respectively, as compared to the previous fortnight. There was 85.9mm rainfall during the fortnight.

Crop weather situation

The maximum and minimum temperatures are slightly higher than the average value of previous 5 years. Evaporation rate, wind speed and rainfall received are also higher. During this month field preparation, FYM and fertilizer application may be completed wherever it was not done. Green manures may be incorporated or leguminous vegetables may be grown as intercrops in fruit orchards. During the period, slightly early maturity of mango varieties like Alphonso, Totapuri, Amrapali, Langra and Dusheri by about a week to ten days was observed. The weather condition was suitable for the cultivation of *Calocybe indica*, *Macrocybe gigantea*, *Pleurotus tuber-regium* and *Hypsizygus ulmarius* under evaporative cooling structures.

Incidence of pests and diseases

Under the prevailing weather situation, following pests are expected under Bangalore conditions on various horticultural crops. Different management options for their management are mentioned below.

I. Fruit Crops:

Mango stem borer

- This period coincides with the emergence of adult beetles of trunk borer, *Batocera rufomaculata*. Plug active holes (can be diagnosed with the presence of fresh chewed wood material and excreta) with cotton dipped in dichlorovos @ 5ml/L and close with

mud. In case of severe infestation IIHR developed Sealer cum healer can be used. Affected tree trunks can be wrapped with nylon mesh to trap the emerging beetles.

II. Vegetable crops:

Fruit fly on cucurbits

- For the management of fruit fly (*Bactrocera cucurbitae*) on cucurbits, following integrated approach may be followed. Installing cue lure traps @ 10 traps/acre + Sanitation (complete destruction of infested fruits at each harvest) + Bait spray (Deltamethrin 0.1 % + jaggery @ 10g/L) at 10 days interval from the date of flowering.

Chilli Thrips

- Spray fipronil 5 SC (1.5 ml/l) or imidacloprid 200 SL (0.3 ml/l) alternatively at fortnightly interval.

Root-knot nematode in tomato

- Raise healthy transplants on soil applied with FYM or vermicompost @5 tons/ha enriched with *Trichoderma harzianum* @ 2kg + *Paecilomyces lilacinus* @ 2kg + *Pseudomonas fluorescens* @2kg /ton of FYM.
- In standing crop, apply neem cake enriched with above biopesticides @ 50g/ m². This can also be mixed with water and applied as soil drench @ 2l/m². The same can be thoroughly filtered and sent along with drip or sprayed.

III. Ornamental crops:

Whitefly on Gerbera (polyhouse)

- Spray diafenthiuran 50 WP @ 1 g/l followed by dinetofuran 20 SG@ 1g/litre
- Install yellow sticky traps coated with adhesive or sticky glue at crop canopy level for monitoring adult whitefly population.

Rose Thrips

- Spray imidacloprid 17.8 ml/l or dimethoate 30 EC @ 2ml/l with pongamia oil 0.5%.
- Apply Fipronil 5 SC @ 1.5 ml/l in case of severe infestations.
- Drench the soil with Chlorpyrifos 20 EC @ 5ml/l for killing pupae in the soil.

Midge on crossandra

- Incidence of midge is increasing on crossandra. For its management spray imidacloprid 17.8 SL@ 0.5 ml/l.

Disease Scenario

Disease forecast based on the weather data for first fortnight of June 2019

I. Fruit Crops

Mango

- Anthracnose (*C. gloeosporioides*) and stem end rot (*Lasiodiplodia theobromae* and *Pestalotia mangiferae*) are common in mango fruits during ripening. Pre-harvest sprays with Carbendazim (0.1%) or Thiophanate methyl (0.1%) followed by post-harvest treatments with Hot water (52oC) for ten minutes is recommended.

Grape

- Grapevines should be continued to be protected against the infection of (i) downy mildew: by the application of 0.4g Dimethomorph + 2.00 g Mancozeb /l or Metalaxyl + Mancozeb (0.2%)/ Al Fosetyl (0.2%) along with sticker @ 0.5 ml/ l. Lower surface of the leaves on the vines to be sprayed properly (ii) anthracnose: spraying with Propineb (0.2%)/ Chlorothalonil (0.2%)/Carbendazim (0.1%)/ Thiophanate methyl (0.1%) are effective along with sticker @ 0.5 ml/ l.

Papaya

- Infection of Anthracnose (*C. gloeosporioides*), Black spot (*Asperisporium caricae*) may further increase. Application of Chlorothalonil (0.2%) Carbendazim (0.1%)/ Thiophanate methyl (0.1%)/ Hexaconazole (0.1%) along with the sticker @ 0.5ml/l with good coverage of the lower surface of the foliage is recommended.

Pomegranate

- Intensity of leaf and fruit spot disease caused by *Pseudocercospora punicae* and anthracnose of fruit and leaf (*C. gloeosporioides*) may increase further. Application of Chlorothalonil (0.2%) /Antracol (0.2%)/ Carbendazim (0.1%)/ Thiophanate methyl (0.1%)/ Hexaconazole (0.1%) along with the sticker @ 0.5ml/l is effective for the disease control.
- Nodal Blight needs further attention. Application of COC (0.2%) + Streptocycline (300 ppm) /l along with the sticker @ 0.5ml/l should be applied at the interval of 15 – 20 days.

Guava

- Canker (*Pestalotiopsis psidi*) in greenish immature guava fruits and styler end rot (*Phomopsis psidi*) and anthracnose (*C. gloeosporioides*) should be taken care. For the disease management application of Zineb (0.3%) or Ziride (0.4%) followed with Carbendazim (0.1%)/ Thiophanate methyl (0.1%)/ along with sticker (0.5 ml /l) should be followed.

II. Vegetable Crops

Cucurbits

- In cucurbits it is time to monitor the downy mildews. Continuous rain and warm weather favour the disease. Spray of metalaxyl at 0.2% will reduce the spread.

Tomato

- In tomato with the onset of monsoon the spread of buck eye spot damage on fruits may occur. This can be prevented by spray of copper oxy chloride at 3g/l and in severe cases spray with fenamidon + mancozeb at 0.2% will reduce the disease incidence.

Chilli

- In chillies the leaf curl will spread further. Suitable insecticides to be applied to control the insect vectors.

III. Ornamentals

- The black spot of rose can be managed by spray with trifloxystrobin + tebuconazole at 0.1% at 15 days interval. For the downy mildews spray with metalaxyl + mancozeb at 0.2% will help.

**CROP WEATHER SITUATION
METEOROLOGICAL DATA OF
ICAR-INDIAN INSTITUTE OF HORTICULTURAL RESEARCH
HESSARAGHATTA LAKE P.O., BANGALORE – 560 089**

Period: 16th to 30th June, 2019

Latitude: 13⁰7¹ N

Longitude: 77⁰ 29¹E

Altitude: 890 M

Fortnight	Temperature (°C)		Relative Humidity (%)		Evaporation (mm)	Wind speed (km/h)	Total Rainfall (mm)
	Average Max.	Average Min.	Average at 7.30AM	Average at 1.30PM			
June 16 th to 30 th , 2019	30.7	21.1	80.0	59.5	5.06	7.8	0.9
	(29.3)	(20.5)	(78.0)	(53.3)	(3.6)	(6.6)	(29.2)

* Figures in the parentheses indicate the average values during the corresponding period for the previous 5 years

Fortnight from 16th to 30th June, 2019

During the Second fortnight of the month i.e., from June 16th to 30th, 2019, the average maximum temperature and minimum temperature were lower by 0.4°C, as compared to the previous fortnight. The average maximum temperature and minimum temperature were lower by 1.1°C and 0.5°C, respectively, as compared to the average values of the corresponding period for the previous five years. The percent relative humidity during morning and afternoon were lower by 4.9% and 5.4% respectively, as compared to the previous fortnight. There was 0.9mm rainfall during the fortnight.

Crop weather situation

The low rainfall in this fortnight might have affected nutrient and water availability to kharif vegetables. Foliar spray of vegetable special micronutrient formulation is recommended @ 2 g/l. regarding Mushroom cultivation, the weather condition is suitable for the cultivation of *Calocybe indica*, *Macrocybe gigantea*, *Pleurotus tuber-regium* and *Hypsizyguis ulmarius* under evaporative cooling structures.

Incidence of pests and diseases

Under the prevailing weather conditions, the following pests were observed in Bangalore on various horticultural crops during Second fortnight of June, 2019. Pest management options are mentioned below,

I. Fruit Crops:

Mango stem borer

- This period coincides with the emergence of adult beetles of trunk borer, *Batocera rufomaculata*. Plug active holes (can be diagnosed with the presence of fresh chewed wood material and excreta) with cotton dipped in chlorpyrifos @ 5ml/L and close with mud. In case of severe infestation IIHR developed Sealer cum healer can be used.

II. Vegetable crops:

Fruit fly on cucurbits

- For the management of fruit fly (*Bactrocera cucurbitae*) on cucurbits, following integrated approach may be followed. Installing cue lure traps @ 10 traps/acre + Sanitation (complete destruction of infested fruits at each harvest) + Bait spray (Deltamethrin 0.1 % + jaggery @ 10g/L) at 10 days interval from the date of flowering.

Chilli Thrips

- Spray fipronil 5 SC (1.5 ml/l) or imidacloprid 200 SL (0.3 ml/l) alternately at fortnightly interval.

Cut worms

- Incidence of cutworms may be seen up to 15-20 days after transplantation of vegetable crops
- Young seedlings will be cut at ground level by cut worm larvae during night time
- Drench the soil around the root zone of the crop with Chlorpyrifos 20 EC @ 5ml/l for killing larvae in the soil.

Legumes pod borer

- Spray indoxacarb 14.5 SC @ 0.75ml/litre at 10 days interval from flowering stage

Root-knot nematode in tomato

- Raise healthy transplants on soil mixed with Neem cake @ 50kg + *Trichoderma harzianum* @ 1kg + *Paecilomyces lilacinus* @ 1kg /ton of soil.
- Apply 2 kg of Farm yard manure enriched with bio-pesticides –*T. harzianum* and *P. lilacinus* at the time of planting.

III. Ornamental crops:

Whitefly on Gerbera (polyhouse)

- Spray diafenthiuran @ 1 g/l followed by dinetofuran 1g/litre
- Install yellow sticky traps coated with adhesive or sticky glue at crop canopy level for monitoring adult whitefly population

Rose Thrips

- Spray acephate 75 SP @ 1.5 g/l or dimethoate 30 EC @ 2ml/l with pongamia oil 0.5%.
- Apply Fipronil 5 SC @ 1.5 ml/l in case of severe infestations.
- Drench the soil with Chlorpyrifos 20 EC @ 5ml/l for killing pupae in the soil.

Midge on crossandra

- Incidence of midge is increasing on crossandra. For its management spray acephate @ 1.5 g/l or imidacloprid @ 0.5 ml/l.

Disease Scenario

Disease forecast based on the weather data for second fortnight of June, 2019

I. Fruit crops

Grape

Grapevines should be continued to be protected against the infection of (i) downy mildew: by the application of 0.4g Dimethomorph + 2.00 g Mancozeb /l or Metalyxl + Mancozeb (0.2%)/ Al Fosetyl (0.2%) along with sticker @ 0.5 ml/ l. Lower surface of the leaves on the vines to be sprayed properly (ii) anthracnose: spraying with Propineb (0.2%)/ Chlorothalonil (0.2%)/Carbendazim (0.1%)/ Thiophanate methyl (0.1%) are effective along with sticker @ 0.5 ml/ l. (iii) Rust (on var Bangalore blue): treatment with Chlorothalonil (0.2%) or Bitertanol (0.2%).

Pomegranate

- Intensity of leaf and fruit spot disease caused by *Pseudocercospora punicae* and anthracnose of fruit and leaf (*C. gloeosporioides*) needs attention. Application of Chlorothalonil (0.2%) /Antracol (0.2%)/ Carbendazim (0.1%)/ Thiophanate methyl (0.1%)/ Hexaconazole (0.1%) along with the sticker @ 0.5ml/l is effective for the disease control.
- Nodal Blight needs continuous attention. Application of COC (0.2%) + Streptocycline (300 ppm) /l along with the sticker @ 0.5ml/l should be applied at the interval of 15 – 20 days.

Banana

- Moderate increase in the intensity of Sigatoka leaf spot (*Mycosphaerella* sp) was noticed compared with the last fortnight whereas anthracnose of fruits (*C. musae*) and crown rot caused by *Fusarium moniliformae* were recorded. For controlling Sigatoka application of Dinocap (0.1%) or Chlorothalonil (0.2%) is recommended whereas crown rot and anthracnose could be effectively managed by the pre-harvest sprays with Carbendazim (0.1%) or Thiophanate methyl (0.1%) followed by post harvest dip in Chlorine water (300 ppm) for 10 minutes.

Papaya

- Foliar, fruit as well as internal infection of Anthracnose (*C. gloeosporioides*), Black spot (*Asperisporium caricae*) may advance Application of Chlorothalonil (0.2%) Carbendazim (0.1%)/ Thiophanate methyl (0.1%)/ Hexaconazole (0.1%) along with the sticker @ 0.5ml/l with good coverage of the lower surface of the foliage is recommended.

II. Vegetable Crops

Tomato

- It is the time for the protective sprays of contact fungicides like mancozeb, copper oxychloride or chlorothalonil on tomato to avoid early leaf blight. In case of serious spread due to rain splash follow up spray with propineb (0.2%) or metiram (0.2%) or pyraclostrobin + metiram (0.2%) at fortnightly interval.

Onion

- To avoid the purple blotch and *Stemphyllum* leaf blight application of fungicides such as Chlorothalonil (0.2 %) or Propineb (0.2 %) or Mancozeb (0.2%) at fortnightly intervals from onset of the disease will be useful

Cucurbits

- To avoid the spread of downy mildew spraying Chlorothalonil (0.2%) or Mancozeb(0.2%) or Metalaxyl -Mancozeb(0.2%) or Fosetyl-AI (0.2%) or Cymoxanil- mancozeb(0.2%) 10-day intervals from onset of the disease.

Viral diseases in tomato and chilli

- To avoid the spread of viral diseases spraying of neem oil or neem soap at early stages of crop growth after transplanting till flowering stage will help.

**CROP WEATHER SITUATION
METEOROLOGICAL DATA OF
ICAR-INDIAN INSTITUTE OF HORTICULTURAL RESEARCH
HESSARAGHATTA LAKE P.O., BANGALORE – 560 089**

Period: 1st to 15th July, 2019

Latitude: 13^o7¹ N

Longitude: 77^o 29¹E

Altitude: 890 M

Fortnight	Temperature (°C)		Relative Humidity (%)		Evaporation (mm)	Wind speed (km/h)	Total Rainfall (mm)
	Average Max.	Average Min.	Average at 7.30AM	Average at 1.30PM			
July 1 st to 15 th , 2019	30.7	20.8	81.0	58.3	6.2	10.12	5.2
	(28.3)	(20.3)	(77.8)	(55.2)	(3.5)	(6.6)	(50.3)

* Figures in the parentheses indicate the average values during the corresponding period for the previous 5 years

Fortnight from 1st to 15th July, 2019

During the first fortnight of the month i.e., from July 1st to 15th, 2019, there is no change in the average maximum and minimum temperature was lower by 0.3°C, as compared to the previous fortnight. The average maximum temperature and minimum temperatures were lower by 1.0°C and 0.2°C, respectively, as compared to the average values of the corresponding period for the previous five years. The percent relative humidity during morning was higher by 1.0% and afternoon was lower by 1.2%, as compared to the previous fortnight. There was 5.2mm rainfall during the fortnight.

Crop weather situation

During this period temperatures was higher. Rainfall received was very low. Wind speed and evaporation rates were very high. So supplemental irrigation may be given to Kharif planted crops. To reduce evaporation rates straw mulch or any other mulch may be applied at the base of the crops. Spraying of vegetable special may be done to the standing vegetable crops to supplement the required micronutrients. In July, air layered plants are taking more time for rooting due to less humidity. Slightly earlier maturity by about a week of Arka Sahan Annona fruits with marginal reduction in fruit size was observed during the relatively warmer and drier spell than usual. The weather condition was suitable for the cultivation of *Calocybe indica*, *Macrocybe gigantea*, *Pleurotus tuber-regium* and *Hypsizygyus ulmarius* under evaporative cooling structures.

Incidence of pests and diseases

Under the prevailing weather situation, following pests are expected under Bangalore conditions on various horticultural crops. Different management options for their management are mentioned below.

I. Fruit Crops:

Mango stem borer

- This period coincides with the emergence of adult beetles of trunk borer, *Batocera rufomaculata*. Plug active holes (can be diagnosed with the presence of fresh hewed wood material and excreta) with cotton dipped in dichlorvos*/Chlorpyrifos @ 5ml/L and close with mud. In case of severe infestation IIHR developed Sealer cum healer can be used.

II. Vegetable crops:

Fruit fly on cucurbits

- For the management of fruit fly (*Bactrocera cucurbitae*) on cucurbits, following integrated approach may be followed. Installing cue lure traps @ 10 traps/acre + Sanitation (complete destruction of infested fruits at each harvest) + Bait spray (Deltamethrin 0.1 % + jaggery @ 10g/L) at 10 days interval from the date of flowering.

Chilli Thrips

- Spray fipronil 5 SC (1.5 ml/l) or imidacloprid 17.8 SL (0.3 ml/l) alternately at fortnightly interval.

Cut worms

- Incidence of cutworms may be seen up to 15-20 days after transplantation of vegetable crops.
- Young seedlings will be cut at ground level by cut worm larvae during night time.
- Drench the soil around the root zone of the crop with Chlorpyrifos 20 EC @ 5ml/l for killing larvae in the soil.

Legumes pod borer

- Spray indoxacarb 14.5 SC @ 0.75ml/litre at 10 days interval from flowering stage.

Root-knot nematode in tomato

- Raise healthy transplants on soil applied with FYM or vermicompost @5 tons/ha enriched with *Trichoderma harzianum* @ 2kg + *Paecilomyces lilacinus* @ 2kg + *Pseudomonas fluorescens* @2kg /ton of FYM.
- In standing crop, apply neem cake enriched with above biopesticides @ 50g/ m². This can also be mixed with water and applied as soil drench @ 2l/m². The same can be thoroughly filtered and sent along with drip or sprayed.

Root-knot nematode in tomato

- Seed treatment with *Trichoderma harzianum* or *Pseudomonas fluorescens* @ 15-20g/kg seed.
- Soil application of FYM or vermicompost @5 tons/ha enriched with *Trichoderma harzianum* @ 2kg + *Paecilomyces lilacinus* @ 2kg + *Pseudomonas fluorescens* @2kg /ton of FYM.
- In standing crop, apply neem cake enriched with above Biopesticides @ 50g/ m². This can also be mixed with water and applied as soil drench @ 2l/m². The same can be thoroughly filtered and sent along with drip or sprayed.

III. Ornamental crops:

Whitefly on Gerbera (polyhouse)

- Spray diafenthiuran @ 1 g/l followed by dinetofuran 1g/litre.
- Install yellow sticky traps coated with adhesive or sticky glue at crop canopy level for monitoring adult whitefly population.

Rose Thrips

- Spray imidacloprid 17.8 ml/l or dimethoate 30 EC @ 2ml/l with pongamia oil 0.5%.
- Apply Fipronil 5 SC @ 1.5 ml/l in case of severe infestations.
- Drench the soil with Chlorpyrifos 20 EC @ 5ml/l for killing pupae in the soil.

Midge on crossandra

- Incidence of midge is increasing on crossandra. For its management spray imidacloprid 0.5 ml/l.

Note: * Dichlorvos is banned completely w. e. f 31st Dec 2020.

Disease Scenario

Disease forecast based on the weather data for first fortnight of July 2019.

I. Fruit Crops

Grape

- Grapevines needs to be protected against the infection of (i) downy mildew: by the application of 0.5g Dimethomorph + 2.00 g Mancozeb /l or Metalaxyl + Mancozeb (0.2%)/ AI Fosetyl (0.2%) along with sticker @ 0.5 ml/ l. Lower surface of the leaves on the vines to be sprayed properly (ii) anthracnose: spraying with Propineb (0.2%)/ Chlorothalonil (0.2%)/Carbendazim (0.1%)/ Thiophanate methyl (0.1%) are effective along with sticker @ 0.5 ml/ l. (iii) Rust (on var Bangalore Blue): treatment with Chlorothalonil (0.2%) or Bitertanol (0.2%).

Papaya

- Foliar, fruit as well as internal infection of Anthracnose (*C. gloeosporioides*), Black spot (*Asperisporium caricae*) may advance. Application of Chlorothalonil (0.2%) Carbendazim (0.1%)/ Thiophanate methyl (0.1%)/ Hexaconazole (0.1%) along with the sticker @ 0.5ml/l with good coverage of the lower surface of the foliage is recommended.

Pomegranate

- Intensity of leaf and fruit spot disease caused by *Pseudocercospora punicae* and anthracnose of fruit and leaf (*C. gloeosporioides*) needs attention. Application of Chlorothalonil (0.2%) /Propineb (0.2%)/ Carbendazim (0.1%)/ Thiophanate methyl (0.1%)/ Hexaconazole (0.1%) along with the sticker @ 0.5ml/l is effective for the disease control.
- Fresh Bacterial blight infection can be seen due to rains. That requires continuous attention. Application of COC (0.2%) + Streptocycline (300 ppm) /l along with the sticker @ 0.5ml/l should be applied at the interval of 15 – 20 days.

Sapota

- There was no appreciable change in the intensity of leaf spot (*P. indicia*) disease compared with last fortnight. Application of Zineb (0.3%) or Ziride (0.4%) along with sticker (0.5 ml /l) are recommended for their management.

II. Vegetable Crops

Cucurbits

- Spraying of Chlorothalonil (0.2%) or Mancozeb(0.2%) or Metalaxyl -Mancozeb(0.2%) or Fosetyl-AI (0.2%) or Cymoxanil- mancozeb(0.2%) 10-day intervals from onset of downy mildew will reduce the damage.

Tomato

- Foliar application of copper oxychloride (0.3%) or Chlorothalonil (0.2%) or Mancozeb (0.2%) or Propineb (0.2%) or Metiram (0.2%) or Pyraclostrobin + metiram (0.2%) at fortnightly interval will reduce the spread of early leaf blight of tomato caused by *Alternaria* species. To prevent the late blight caused by *Phytophthora infestans* spraying of Mancozeb (0.2%) or Copper oxychloride (0.3%), Copper hydroxide(0.2%) or Fosetyl-AI (0.2%) or Pre-packed mixture of Metalaxyl+Mancozeb (0.2%) may be carried out that may reduce the risk of serious infection expected in the later part of the season. Spraying

of acephate at .01% or imidacloprid at 0.03% will reduce the tospovirus infection spread by thrips.

Chilli and Capsicum

- To prevent the leaf blight by *Phytophthora capsici* spraying of Mancozeb (0.2%) or Copper oxychloride (0.3%), Copper hydroxide(0.2%) or Fosetyl-Al (0.2%) or Pre-packed mixture of MetalaxylMancozeb (0.2%) may be carried out that may reduce the risk of serious infection expected in the later part of the season. Spray of insecticides like Monocrotophos (0.15%), Acephate (0.15%) or Hostothion (0.1 %) at fortnightly intervals after transplanting, until the flowering stage will reduce vector transmitted viral diseases incidence.

Onion

- Application of fungicides such as Chlorothalonil (0.2 %) or Propineb (0.2 %) or Mancozeb (0.2%) at fortnightly intervals from onset of the disease may reduce the purple blotch or Stemphylium leaf blight.

III. Ornamentals

Rose

- To avoid the black spot in rose prophylactic spray with contact fungicides will help (chlorothalonil or mancozeb at 0.2%) along with sticker. If severe cases trifloxystrobin+tebuconazole at 0.1% at 15 days interval will reduce the disease incidence.

Marigold

- To avoid the spread of *Alternaria* blight prophylactic spray with copper oxy chloride, chlorothalonil or mancozeb at 0.2% at 15 days interval will help.

**CROP WEATHER SITUATION
METEOROLOGICAL DATA OF
ICAR-INDIAN INSTITUTE OF HORTICULTURAL RESEARCH
HESSARAGHATTA LAKE P.O., BANGALORE – 560 089**

Period: 16th to 31st July, 2019

Latitude: 13°7¹ N

Longitude: 77° 29¹E

Altitude: 890 M

Fortnight	Temperature (°C)		Relative Humidity (%)		Evaporation (mm)	Wind speed (km/h)	Total Rainfall (mm)
	Average Max.	Average Min.	Average at 7.30AM	Average at 1.30PM			
July 16 th to 31 st , 2019	28.7	20.9	85.6	67.5	4.31	8.08	42.5
	(29.1)	(20.7)	(76.9)	(54.5)	(3.7)	(6.5)	(56.3)

* Figures in the parentheses indicate the average values during the corresponding period for the previous 5 years

Fortnight from 16th to 31st July, 2019

During the Second fortnight of the month i.e., from July 16th to 31st, 2019, the average maximum temperature was lower by 2.0°C and minimum temperature was higher by 0.1°C, as compared to the previous fortnight. The average maximum temperature and minimum temperature were higher by 0.2°C and 0.4°C, respectively, as compared to the average values of the corresponding period for the previous five years. The percent relative humidity during morning and afternoon were higher by 4.6% and 9.2% respectively, as compared to the previous fortnight. There was 42.5 mm rainfall during the fortnight.

Crop weather situation

During last fortnight temperatures are slightly lower and relative humidity is slightly higher compared to the average values of last 5 years. Rain fall received was lower than the average value of previous 5 years. Wind speed and evaporation rates are higher. Required fertilizers and manures may be given as soil conditions are conducive for nutrient application. Intercultural operations may be taken up. Regarding Mushroom cultivation, the weather condition is suitable for the *Calocybe indica*, *Macrocybe gigantea*, *Pleurotus tuber-regium* and *Hypsizygus ulmarius* under evaporative cooling structures.

Incidence of pests and diseases

Under the prevailing weather conditions, the following pests were observed in Bangalore on various horticultural crops during Second fortnight of July, 2019. Pest management options are mentioned below,

I. Fruit Crops:

Fruit fly in Custard Apple

- For the management of fruit fly (*Bactrocera dosalis*) on custard apple, following integrated approach may be followed. Installing cue lure traps @ 10 traps/acre +

Sanitation (complete destruction of infested fruits at each harvest) + Bait spray (Deltamethrin 0.1 % + jaggery @ 10g/L) at 10 days interval.

II. Vegetable crops:

Fruit fly on cucurbits

- For the management of fruit fly (*Bactrocera cucurbitae*) on cucurbits, following integrated approach may be followed. Installing cue lure traps @ 10 traps/acre + Sanitation (complete destruction of infested fruits at each harvest) + Bait spray (Deltamethrin 0.1 % + jaggery @ 10g/L) at 10 days interval from the date of flowering.

Brinjal

- Infestation of *Myloccerus* weevil is noticed for which drenching of soil with the chloropyrifos (5 ml/ l) is recommended.

Chilli Thrips

- Spray fipronil 5 SC (1.5 ml/l) or imidacloprid 200 SL (0.3 ml/l) alternately at fortnightly interval.

Root-knot nematode in tomato

- Raise healthy transplants on soil applied with FYM or vermicompost @5 tons/ha enriched with *Trichoderma harzianum* @ 2kg + *Paecilomyces lilacinus* @ 2kg + *Pseudomonas fluorescens* @2kg /ton of FYM.
- In standing crop, apply neem cake enriched with above biopesticides @ 50g/ m². This can also be mixed with water and applied as soil drench @ 2l/m². The same can be thoroughly filtered and sent along with drip or sprayed.

III. Ornamental crops:

Whitefly on Gerbera (polyhouse)

- Spray diafenthiuran @ 1 g/l followed by dinetofuran 1g/litre
- Install yellow sticky traps coated with adhesive or sticky glue at crop canopy level for monitoring adult whitefly population

Rose Thrips

- Spray imidacloprid 17.8 ml/l or dimethoate 30 EC @ 2ml/l with pongamia oil 0.5%.
- Apply Fipronil 5 SC @ 1.5 ml/l in case of severe infestations.
- Drench the soil with Chlorpyrifos 20 EC @ 5ml/l for killing pupae in the soil.

Midge on crossandra

- Incidence of midge is increasing on crossandra. For its management spray imidacloprid @ 0.5 ml/l.

Disease Scenario

Disease forecast based on the weather data for second fortnight of July, 2019

I. Fruit crops

Grape

Grapevines need to be protected against the infection of (i) downy mildew: by the application of 0.4g Dimethomorph + 2.00 g Mancozeb /l or Metalaxyl + Mancozeb (0.2%)/ Al Fosetyl (0.2%) along with sticker @ 0.5 ml/ l. Lower surface of the leaves on the vines to be sprayed properly (ii) anthracnose: spraying with Propineb (0.2%)/ Chlorothalonil (0.2%)/Carbendazim (0.1%)/ Thiophanate methyl (0.1%) are effective along with sticker @ 0.5 ml/ l. (iii) Rust (on var Bangalore Blue): treatment with Chlorothalonil (0.2%) or Bitertanol (0.2%).

Pomegranate

- Intensity of leaf and fruit spot disease caused by *Pseudocercospora punicae* and anthracnose of fruit and leaf (*C. gloeosporioides*) needs attention. Application of Chlorothalonil (0.2%) /Propineb (0.2%)/ Carbendazim (0.1%)/ Thiophanate methyl (0.1%)/ Hexaconazole (0.1%) along with the sticker @ 0.5ml/l is effective for the disease control.
- Fresh Bacterial blight infection can be seen due to rains. That requires continuous attention. Application of COC (0.2%) + Streptocycline (300 ppm) /l along with the sticker @ 0.5ml/l should be applied at the interval of 15 – 20 days.

Papaya

- Foliar, fruit as well as internal infection of Anthracnose (*C. gloeosporioides*), Black spot (*Asperisporium caricae*) may advance. Application of Chlorothalonil (0.2%) Carbendazim (0.1%)/ Thiophanate methyl (0.1%)/ Hexaconazole (0.1%) along with the sticker @ 0.5ml/l with good coverage of the lower surface of the foliage is recommended.

Sapota

- There was no appreciable change in the intensity of leaf spot (*P. indicia*) disease compared with last fortnight. Application of Zineb (0.3%) or Ziride (0.4%) along with sticker (0.5 ml /l) are recommended for their management.

II. Vegetable Crops

Tomato

- Foliar application of copper oxychloride (0.3%) or Chlorothalonil (0.2%) or Mancozeb (0.2%) or Propineb (0.2%) or Metiram (0.2%) or Pyraclostrobin + metiram (0.2%) at fortnightly interval will reduce the spread of early leaf blight of tomato caused by *Alternaria* species. To prevent the late blight caused by *Phytophthora infestans* spraying of Mancozeb (0.2%) or Copper oxychloride (0.3%), Copper hydroxide(0.2%) or Fosetyl-Al (0.2%) or Pre-packed mixture of Metalaxyl+Mancozeb (0.2%) may be carried out that may reduce the risk of serious infection expected in the later part of the season. Spraying of acephate at .01% or imidacloprid at 0.03% will reduce the tospovirus infection spread by thrips.

Chillies and capsicum

- To prevent the leaf blight by *Phytophthora capsici* spraying of Mancozeb (0.2%) or Copper oxychloride (0.3%), Copper hydroxide(0.2%) or Fosetyl-AI (0.2%) or Pre-packed mixture of MetalaxylMancozeb (0.2%) may be carried out that may reduce the risk of serious infection expected in the later part of the season. Spray of insecticides like Monocrotophos (0.15%), Acephate (0.15%) or Hostothion (0.1 %) at fortnightly intervals after transplanting, until the flowering stage will reduce vector transmitted viral diseases incidence.

Onion

- Application of fungicides such as Chlorothalonil (0.2 %) or Propineb (0.2 %) or Mancozeb (0.2%) at fortnightly intervals from onset of the disease may reduce the purple blotch or Stemphylium leaf blight.

Cucurbits

- Spraying of Chlorothalonil (0.2%) or Mancozeb(0.2%) or Metalaxyl -Mancozeb(0.2%) or Fosetyl-AI (0.2%) or Cymoxanil- mancozeb(0.2%) 10-day intervals from onset of downy mildew will reduce the damage.

III. Ornamental crops:

Rose

- To avoid the black spot in rose prophylactic spray with contact fungicides will help (chlorothalonil or mancozeb at 0.2%) along with sticker. If severe cases trifloxystrobin+tebuconazole at 0.1% at 15 days interval will reduce the disease incidence.

Marigold

- To avoid the spread of Alternaria blight prophylactic spray with chlorothalonil or mancozeb at 0.2% at 15 days interval will help.

**CROP WEATHER SITUATION
METEOROLOGICAL DATA OF
ICAR-INDIAN INSTITUTE OF HORTICULTURAL RESEARCH
HESSARAGHATTA LAKE P.O., BANGALORE – 560 089**

Period: 1st to 15th August, 2019

Latitude: 13^o7¹ N

Longitude: 77^o 29¹E

Altitude: 890 M

Fortnight	Temperature (°C)		Relative Humidity (%)		Evaporation (mm)	Wind speed (km/h)	Total Rainfall (mm)
	Average Max.	Average Min.	Average at 7.30AM	Average at 1.30PM			
August 1 st to 15 th , 2019	27.7	20.8	87.4	72.1	4.34	9.99	54.1
	(28.6)	(20.8)	(77.4)	(59.5)	(3.4)	(5.0)	(61.0)

* Figures in the parentheses indicate the average values during the corresponding period for the previous 5 years

Fortnight from 1st to 15th August, 2019

During the first fortnight of the month i.e., from August 1st to 15th, 2019, the average maximum and minimum temperatures were lower by 1.0°C and 0.1°C respectively, as compared to the previous fortnight. The average maximum temperature was lower by 0.5°C and minimum temperature was higher by 0.1°C, respectively, as compared to the average values of the corresponding period for the previous five years. The percent relative humidity during morning and afternoon were higher by 1.8% and 4.6% respectively, as compared to the previous fortnight. There was 54.1mm rainfall during the fortnight.

Crop weather situation

During the first fortnight of August, 2019, average maximum temperature was lower, relative humidity was higher, average rainfall received was lower and wind speed and evaporation rate were higher compared to the average values of previous 5 years. If soil condition is good, intercultural operations may be taken up. Required dose of fertilizers and manures may be given as per the recommendations. The climate during the fortnight was very suitable for the cultivation of all *Pleurotus* species, *Agrocybe* species, *Lentinula* species and *Hericium* species. Cultivation of *Calocybe* and *Macrocybe* species could be done with longer duration and lesser bio efficiency.

Incidence of pests and diseases

Under the prevailing weather conditions, the following pests are expected in Bangalore on various horticultural crops. Their management options are mentioned below.

Fruit Crops

Leaf Webber on mango

- Remove and destroy the webbed portions wherever they are accessible
- For the management of this pest prune the affected shoots and spray lambda cyhalothrin 5EC @ 1ml/l

Mango shoot borer

- Clip and destroy affected shoots

- Spray lambda cyhalothrin 5EC @ 1ml/l or Quinalphos 25 EC @ 2ml/l at the time of emergence of new flush. This will also take care of leaf eating weevil, *Rhynchaenus mangiferae*

Fruit fly on cucurbits

- For the management of fruit fly on cucurbits, following integrated approach may be followed. Deployment of cue lure traps @ 15 traps/acre + Sanitation (complete destruction of infested fruits at each harvest) + Bait spray (deltamethrin 1 ml + jaggery @ 10g/L) at 10 day's interval from the date of flowering
- Bait Splash of 40/ acre (150g jaggery + 500mlwater + 5ml deltamethrin)

Tomato moth

- Install *tuta* pheromone traps for monitoring of the adults @ 4-6 traps/acre
- Spray indoxacarb 14.5 SC @ 0.75 ml/litre or spinosad 45 SC @ 0.3ml/l

Mites on tomato

- For the management of mites, spray wettable sulphur @ 3 g/l or propargite 57 EC @ 1.25 ml/l or fenazaquin 10EC @ 1.5ml/litre

Chilli Thrips

- Spray fipronil 5 SC (1.5 ml/l) or Difenthran 50WP @ 1g/litre or thiacloprid 240 SC @ 0.5 ml/l alternately at fortnightly interval

Root-knot nematode in tomato

- Raise healthy transplants on soil applied with FYM or vermicompost @5 tons/ha enriched with *Trichoderma harzianum* @ 2kg + *Paecilomyces lilacinus* @ 2kg + *Pseudomonas fluorescens* @2kg /ton of FYM.
- In standing crop, apply neem cake enriched with above biopesticides @ 50g/ m². This can also be mixed with water and applied as soil drench @ 2l/m². The same can be thoroughly filtered and sent along with drip or sprayed

Rose Thrips

- Spray imidacloprid 17.8 SL @ 0.5ml/l or dimethoate 30 EC @ 2ml/l with pongamia oil 0.5%
- Apply Fipronil 5 SC @ 1.5 ml/l in case of severe infestations
- Drench the soil with Chlorpyrifos 20 EC @ 5ml/l for killing pupae in the soil

Mites on rose

- For the management of mites, spray milbemectin @ 1 ml/l

Midge on crossandra

- Under the prevailing conditions, incidence of midge increases on crossandra. For its management spray imidacloprid @ 0.5 ml/l

Whitefly on Gerbera (polyhouses)

- Spray diafenthiuran 50WP @ 1 g/l followed by dinetofuran 20SG @1g/litre
- Install yellow sticky traps coated with adhesive or sticky glue at crop canopy level for monitoring adult whitefly population.

*Safe waiting periods are to be followed as per the label claims

Disease Scenario

Disease forecast based on the weather data for first fortnight of August 2019.

Fruit Crops

Grape

Downy mildew

- Protection against the infection of downy mildew by the application of 0.8 g Dimethomorph + 2.00 g Mancozeb /L or Metalyx1 + Mancozeb (0.2%)/ Al Fosetyl (0.2%).

Rust

- Rust needs to be taken care in grape vine orchards (var Bangalore Blue). It could be managed by the treatment with Chlorothalonil (0.2%) along with sticker @ 0.5 ml/ l. Lower surface of the leaves on the vines to be sprayed properly. In white varieties preventive sprays for anthracnose management with difenconazole 0.05% or thiophenate methyl 0.1%

Banana

- Intensity of Sigatoka leaf spot (*Mycosphaerella* sp) may be moderate. For controlling Sigatoka application of Chlorothalonil (0.2%) is recommended. Moderate infection of Leaf (*Dieghthonella* spp.), and fruit spots (*Macrophoma* spp.) may be noticed that could be effectively managed by the pre-harvest sprays with Zineb + Hexaconazole (0.2%) or Thiophanate methyl (0.1%).

Pomegranate

- On fresh foliage and emerging flower buds infection of anthracnose might be noticed whereas Leaf and fruit spot disease caused by *Puedocercospora punicae* may become serious These could be managed by spraying Chlorothalonil (0.2%)/Antracol (0.2%)/ Carbendazim (0.1%)/ Thiophanate methyl (0.1%)/ Hexaconazole (0.1%) along with the sticker @ 0.5ml/l.
- For bacterial blight spray of Bordeaux mixture 1% along with bronopol or streptocycline at 0.5% at 15 day's interval will reduce the spread of the disease.

Vegetables

- Because of intermittent rains spread of **Phytophthora** blight is expected in tomato, chilli and other crops. For initial stages preventive spray with chlorathalonil (0.2%) and Bourdeaux mixture (1%) will help. In severe conditions where spread is faster spraying with cymoxanil + mancozeb (0.1%).
- In solanaceous (tomato, capsicum, chilli) and cucurbitaceous vegetables (pumpkin, cucumber, ridge gourd etc.) **Powdery mildew** may appear with cool and dry weather. Hexaconazole at 0.2% spray with 0.5ml sticker/l will reduce the spread and severity. For Alternaria leaf spot chlorothalonil or dithane M 45 at 0.2% spray as preventive measure will reduce the disease incidence.

**CROP WEATHER SITUATION
METEOROLOGICAL DATA OF
ICAR-INDIAN INSTITUTE OF HORTICULTURAL RESEARCH
HESSARAGHATTA LAKE P.O., BANGALORE – 560 089**

Period: 16th to 31st August, 2019

Latitude: 13^o7¹ N

Longitude: 77^o 29¹E

Altitude: 890 M

Fortnight	Temperature (°C)		Relative Humidity (%)		Evaporation (mm)	Wind speed (km/h)	Total Rainfall (mm)
	Average Max.	Average Min.	Average at 7.30AM	Average at 1.30PM			
August 16 th to 31 st , 2019	28.3	20.3	87.7	78.5	4.48	6.04	144.8
	(28.3)	(20.3)	(80.2)	(58.8)	(3.2)	(4.1)	(66.3)

* Figures in the parentheses indicate the average values during the corresponding period for the previous 5 years

Fortnight from 16th to 31st August, 2019

During the Second fortnight of the month i.e., from August 16th to 31st, 2019, the average maximum temperature was higher by 0.6°C and minimum temperature was lower by 0.5°C, respectively, as compared to the previous fortnight. The average maximum temperature and minimum temperature were lower by 0.3°C and 0.5°C, respectively, as compared to the average values of the corresponding period for the previous five years. The percent relative humidity during morning and afternoon were higher by 0.3% and 6.4% respectively, as compared to the previous fortnight. There was 144.8mm rainfall during the fortnight.

Crop weather situation

In the second fortnight of August there was excess rainfall and relative humidity was more. More rain during this period was conducive for fertilizer application and earthing up in standing horticultural plantations. Sowing of green manure crops in between the standing perennial tree orchards like mango and sapota can be done so that they can be ploughed back in the month of September or October. Split dose of fertilizers may be applied wherever required.

Incidence of pests and diseases

Under the prevailing weather conditions, the following pests were observed in Bangalore on various horticultural crops during Second fortnight of August, 2019. Pest management options are mentioned below.

Fruit Crops:

Hoppers and thrips on mango

- New flush of certain varieties like Alphonso and Banganapalli attracts hoppers and thrips. Spraying with acephate 75SP @ 1.5 g /L along with sticker will check the infestation which otherwise may serve as source for flowering season.

Vegetable Crops:

Fruit fly on cucurbits

- For the management of fruit fly on cucurbits, following integrated approach may be followed. Deployment of cue lure traps @ 15 traps/acre + Sanitation (complete destruction of infested

fruits at each harvest) + Bait spray (deltamethrin 1 ml + jaggery @ 10g/L) at 10 days' interval from the date of flowering.

- Bait Splash of 40/ acre (150g jaggery + 500ml water + 5ml deltamethrin).

Mites on tomato

- For the management of mites' spray wettable sulphur @ 3 g/l or propargite 57 EC @ 1.25 ml/l or fenazaquin 10 EC @ 1.5ml/litre.

Ash weevil on brinjal

- Collect and destroy adults
- Apply oiled neem cake with 8-10% oil to ridges @ 250kg/ha at planting and repeat at 30 Days After planting
- In endemic areas, apply carbofuran 3 G @ 15 kg/ha on 15 days after planting
- Spray Cypermethrin 25 EC @ 0.5 ml/litre.

Floriculture:

Rose thrips

- Spray imidacloprid 17.8 SL @ 0.5ml/l or dimethoate 30 EC @ 2ml/l with pongamia oil 0.5%.
- Apply Fipronil 5 SC @ 1.5 ml/l in case of severe infestations.
- Drench the soil with Chlorpyrifos 20 EC @ 5ml/l for killing pupae in the soil.

Mites on rose

- For the management of mites' spray milbemectin @ 1 ml/l.

Midge on crossandra

- Under the prevailing conditions, incidence of midge increases on crossandra. For its management spray imidacloprid 17.8 SL @ 0.5 ml/l.

Whitefly on Gerbera (polyhouse)

- Spray diafenthiuran 50 WP @ 1 g/l followed by dinetofuran 20 SG @ 1g/litre
- Install yellow sticky traps coated with adhesive or sticky glue at crop canopy level for monitoring adult whitefly population.

Budborer on kakada

- Severe incidence of kakada bud borer is noticed during this period. Spray profenofos 50EC @ 1 ml/l for its management. If the incidence is severe spray indoxacarb 14.5 SC @ 0.75 ml/l.

Disease Scenario

Disease forecast based on the weather data for second fortnight of August, 2019

Fruit crops

Grape

- Protection against the infection of downy mildew by the application of 0.8 g Dimethomorph + 2.00 g Mencozeb /L or Metalyxl + Mancozeb (0.2%)/ Al Fosetyl (0.2%). Rust needs to be taken care in grape vine orchards (var Bangalore Blue). It could be managed by the treatment with Chlorothalonil (0.2%) along with sticker @ 0.5 ml/ l. Lower surface of the leaves on the vines to be sprayed properly. In white varieties preventive sprays for anthracnose management with difenconazole 0.05% or thiophenate methyl 0.1%.

Banana

- Intensity of Sigatoka leaf spot (*Mycosphaerella* sp) may be moderate. For controlling Sigatoka application of Tridemorph (0.1%)/ or Chlorothalonil (0.2%) is recommended. Moderate infection of Leaf (*Dieghthonella* spp.), and fruit spots (*Macrophoma* spp.) may be noticed that could be effectively managed by the pre-harvest sprays with Zineb + Hexaconazole (0.2%) or Thiophanate methyl (0.1%).

Pomegranate

- On fresh foliage and emerging flower buds infection of anthracnose might be noticed whereas Leaf and fruit spot disease caused by *Pseudocercospora punicae* may become serious. These could be managed by spraying Chlorothalonil (0.2%)/Antracol (0.2%)/ Carbendazim (0.1%)/ Thiophanate methyl (0.1%)/ Hexaconazole (0.1%) along with the sticker @ 0.5ml/l.
- For bacterial blight spray of Bordeaux mixture 1% along with bronopol or streptocycline at 0.5% at 15 days interval will reduce the spread of the disease.

Vegetables

- Because of intermittent rains spread of Phytophthora blight is expected in tomato, chilli and other crops. For initial stages preventive spray with chlorothalonil (0.2%) and Bourdeaux mixture (1%) will help. In severe conditions where spread is faster spraying with cymoxanil + mancozeb (0.1%). In solanaceous (tomato, capsicum, chilli) and cucurbitaceous vegetables (pumpkin, cucumber, ridge gourd etc.) Powdery mildew may appear with cool and dry weather. Hexaconazole at 0.2% spray with 0.5ml sticker/l will reduce the spread and severity. For Alternaria leaf spot chlorothalonil or dithane M 45 at 0.2% spray as preventive measure will reduce the disease incidence.

**CROP WEATHER SITUATION
METEOROLOGICAL DATA OF
ICAR-INDIAN INSTITUTE OF HORTICULTURAL RESEARCH
HESSARAGHATTA LAKE P.O., BANGALORE – 560 089**

Period: 1st to 15th September, 2019

Latitude: 13^o7¹ N

Longitude: 77^o 29¹E

Altitude: 890 M

Fortnight	Temperature (°C)		Relative Humidity (%)		Evaporation (mm)	Wind speed (km/h)	Total Rainfall (mm)
	Average Max.	Average Min.	Average at 7.30AM	Average at 1.30PM			
September 1 st to 15 th , 2019	28.2	20.8	87.8	71.1	3.9	6.2	13.4
	(28.5)	(20.5)	(80.6)	(58.3)	(3.4)	(3.9)	(72.2)

* Figures in the parentheses indicate the average values during the corresponding period for the previous 5 years

Fortnight from 1st to 15th September, 2019

During the first fortnight of the month i.e., from September 1st to 15th, 2019, the average maximum temperature was lower by 0.1^oC and minimum temperature was higher by 0.5^oC respectively, as compared to the previous fortnight. The average maximum temperature and minimum temperatures were higher by 0.2^oC each, respectively, as compared to the average values of the corresponding period for the previous five years. The percent relative humidity during morning was higher by 0.1% and afternoon was lower by 7.4% respectively, as compared to the previous fortnight. There was 13.4mm rainfall during the fortnight.

Crop weather situation

During the first fortnight of September, 2019, the mean temperature during the previous five years showed not much difference with the present mean value while relative humidity was marginally higher during morning hours. The rainfall received was lower. The application of second split dose of N and K may be taken up for crops where in split application of fertilizer is recommended. Liberal application of FYM is also recommended as adequate moisture is available in soil.

Incidence of pests and diseases

Under the prevailing weather conditions, the following pests are expected in Bangalore on various horticultural crops. Their management options are mentioned below.

Fruit Crops

Mango shoot borer

- Clip and destroy affected shoots
- Spray acephate 50 WP@ 1.5 g/l or Quinalphos 25 EC @ 2ml/l at the time of emergence of new flush. This will also take care of leaf eating weevil, *Rhynchaenus mangiferae*

Webber and ash weevil on Mango

- Incidence of webber and ash weevil become serious on new leaves. Remove webbed leaves wherever possible and burn them. Spray quinalphos 25 EC @ 2 ml/l or lamda cyhalothrin 5 EC @ 1ml /l for their management

Pomegranate

Fruit sucking moth

- Wherever matured fruits are there fruit sucking moth damage is expected. Netting the orchards is recommended

Thrips

- On new flush, thrips incidence is expected. Spray fipronil 5 SC @ 1.5ml/L

Vegetable Crops

Fruit fly on cucurbits

- For the management of fruit fly on cucurbits, following integrated approach may be followed. Deployment of cue lure traps @ 10 traps/acre + Sanitation (complete destruction of infested fruits at each harvest) + Bait spray (Deltamethrin 0.1 % + jaggery @ 10g/L) at 10 days interval from the date of flowering

Tobacco caterpillar on Tomato

- For the management of this pest, spray indoxacarb @ 0.75 ml/L or thiodicarb 75 WP @ 1 g/L.

Leaf hopper on okra/Bhendi

- Incidence of jassids is observed on okra. Spray imidacloprid 17.8 SL @ 0.3 ml/l, if the crop is at pre-flowering stage. Otherwise, spray neem or pongamia soaps @ 1 %, thoroughly covering lower surface of leaves

Floriculture

Thrips on rose

- Incidence of rose thrips was observed more under polyhouse conditions. Spray acephate 75 SP @ 1 g/l or imidacloprid 17.8 SL @ 0.5 ml/l for its management

Whitefly on Gerbera

- For the management of whitefly on gerbera diafenthiuron 50 WP @ 1g/liter followed by dinetofuran 20SG @ 0.3 g/l. Install yellow sticky traps coated with adhesive or sticky glue at crop canopy level for monitoring adult whitefly population

Disease Scenario

Disease forecast based on the weather data for first fortnight of September 2019.

Fruit Crops

Mango

- Intensity of Leaf spot (*P. mangiferae* / *C. gloeosporioides*) may increase. Application of Zineb (0.2%) / Chlorothalonil (0.2%) or Mancozeb (0.2%) along with the sticker @ 0.5ml/L advisable. Infection of Sooty mould should also be taken care for which application of Copper oxychloride (0.3%) along with sticker (@ 0.5 ml / L) is recommended

Papaya

- Black leaf and fruit spots (*Asperisporium cariceae*) are attaining serious proportions. Application of Thiophanate methyl (0.1%) or Antracol (0.2%) along with sticker @ 0.5 ml/L are recommended. Lower surface of the leaves to be sprayed properly

Grape

- After forward pruning buds on the grapevines should be protected against the infection of downy mildew by the application of 0.8 g Dimethomorph + 2.00 g Macozeb /L or Metalyxl + Mancozeb (0.2%)/ Al Fosetyl (0.2%). Rust needs to be taken care in grape vine orchards (var Bangalore Blue). It could be managed by the treatment with Chlorothalonil (0.2%) or

Bitertanol (0.2%) or Dinocap (0.3%) + Mancozeb (2%) along with sticker @ 0.5 ml/ l. Lower surface of the leaves on the vines to be sprayed properly

Banana

- Intensity of Sigatoka leaf spot (*Mycosphaerella* sp) may be moderate. For controlling Sigatoka application of Tridemorph (0.1%)/ or Chlorothalonil (0.2%) is recommended. Moderate infection of Leaf (*Dieghthonella* spp.), and fruit spots (*Macrophomaspp.*) may be noticed that could be effectively managed by the pre-harvest sprays with Zineb + Hexaconazole (0.2%) or Thiophanate methyl (0.1%)

Pomegranate

- On fresh foliage and emerging flower bud's infection of anthracnose might be noticed whereas Leaf and fruit spot disease caused by *Puedocercospora punicae* may become serious These could be managed by spraying Chlorothalonil (0.2%)/Antracol (0.2%)/ Carbendazim (0.1%)/ Thiophanate methyl (0.1%)/ Hexaconazole (0.1%) along with the sticker @ 0.5ml/l

Vegetable Crops

- **In solanaceous (tomato, capsicum, chilli) and cucurbitaceous vegetables (pumpkin, cucumber, ridge gourd etc.)** Powdery mildew may appear with cool and dry weather. Hexaconazole at 0.2% spray with 0.5ml sticker/l will reduce the spread and severity. For Alternaria leaf spot chlorothalonil or dithane M 45 at 0.2% spray as preventive measure will reduce the disease incidence.
- In places where tomato has been planted late, with incessant rains late blight due to Phytophthora will appear. To prevent spray of copper oxy chloride at 0.2% or Bordeaux mixture 1% is recommended.

**CROP WEATHER SITUATION
METEOROLOGICAL DATA OF
ICAR-INDIAN INSTITUTE OF HORTICULTURAL RESEARCH
HESSARAGHATTA LAKE P.O., BANGALORE – 560 089**

Period: 16th to 30th September, 2019

Latitude: 13^o7¹ N

Longitude: 77^o 29¹E

Altitude: 890 M

Fortnight	Temperature (°C)		Relative Humidity (%)		Evaporation (mm)	Wind speed (km/h)	Total Rainfall (mm)
	Average Max.	Average Min.	Average at 7.30AM	Average at 1.30PM			
September 16 th to 30 th , 2019	29.0	20.4	90.6	70.4	3.36	3.38	12.94
	(28.4)	(20.5)	(80.9)	(56.9)	(3.1)	(3.7)	(96.1)

* Figures in the parentheses indicate the average values during the corresponding period for the previous 5 years

Fortnight from 16th to 30th September, 2019

During the Second fortnight of the month i.e., from September 16th to 30th, 2019, the average maximum temperature was higher by 0.8°C and minimum temperature was lower by 0.4°C, respectively, as compared to the previous fortnight. The average maximum temperature was lower by 0.1°C whereas the minimum temperature remains the same, respectively, as compared to the average values of the corresponding period for the previous five years. The percent relative humidity during morning was higher by 2.8% and during afternoon it was lower by 0.7% respectively, as compared to the previous fortnight. There was 12.94 mm rainfall during the fortnight.

Crop weather situation

In the second fortnight of September there was only marginal difference in mean temperature with that of average for the last five years. The relative humidity both during morning hours and in the evening was relatively higher. The total precipitation receive was far less compared to the same period as average for the last five years. Need based application of micronutrient for crops like banana through foliar application is desirable. Liberal application of FYM is recommended. The weather during the fortnight was excellent for growing oyster mushroom. Shiitake mushroom could be grown with additional cooling.

Incidence of pests and diseases

Under the prevailing weather conditions, the following pests were observed in Bangalore on various horticultural crops during Second fortnight of September, 2019. Pest management options are mentioned below.

Fruit Crops:

Mango shoot borer

- Clip and destroy affected shoots.
- Spray acephate 50 WP@ 1.5 g/l or Quinalphos 25 EC @ 2ml/l at the time of emergence of new flush. This will also take care of leaf eating weevil, *Rhynchaenus mangiferae*.

Webber and ash weevil on Mango

- Incidence of webber and ash weevil become serious on new leaves. Remove webbed leaves wherever possible and burn them. Spray quinalphos @ 2 ml/l or lamda cyhalothrin @ 1ml /l for their management.

Pomegranate

Fruit sucking moth

- Wherever matured fruits are there fruit sucking moth damage is expected. Netting the orchards is recommended

Grapes

- Thrips, *Scirtothrips dorsalis* is expected to occur on leaves of newly pruned Bangalore Blue. Spray fipronil 5 SC @ 1.5ml/L

Vegetable Crops

Fruit fly on cucurbits

- For the management of fruit fly on cucurbits, following integrated approach may be followed. Deployment of cue lure traps @ 10 traps/acre + Sanitation (complete destruction of infested fruits at each harvest) + Bait spray (Deltamethrin 0.1 % + jaggery @ 10g/L) at 10 days' interval from the date of flowering

Tomato moth

- Install tuta pheromone traps for monitoring of the adults @ 4-6 traps/acre
- Spray indoxacarb @ 0.75 ml/litre or spinosad45 SC @ 0.3ml/L

Tobacco caterpillar on Tomato

- For the management of this pest, spray indoxacarb @ 0.75 ml/L or thiodicarb @ 1 g/L

Leaf hopper on okra/Bhendi

- Incidence of jassids is observed on okra. Spray imidacloprid @ 0.3 ml/l, if the crop is at pre-flowering stage. Otherwise, spray neem or pongamia soaps @ 1 %, thoroughly covering lower surface of leaves

Floriculture

Thrips on rose

- Incidence of rose thrips was observed more under polyhouse conditions. Spray acephate @ 1 g/l or imidacloprid @ 0.5 ml/l for its management

Whitefly on Gerbera

- For the management of whitefly on gerbera spray dinetofuran20SG @ 1 g/l or diafenthiuron500SC@ 1ml/litre followed by spirotetramat 240 SC @ 1ml/litre. Install yellow sticky traps coated with adhesive or sticky glue at crop canopy level for monitoring adult whitefly population

Disease Scenario

Disease forecast based on the weather data for second fortnight of September, 2019

Fruit crops

Grape

- Rust might continue to be noticed in grape vine orchards (var Bangalore Blue) and could be managed by the treatment with Chlorothalonil (0.2%) or Bitertanol (0.2%) or Dinocap (0.3%) + Mancozeb (2%) along with sticker @ 0.5 ml/ l

Mango

- Sooty mould should be taken care. Application of Copper oxychloride (0.3%) along with sticker (@ 0.5 ml / L) is recommended. Further hopper and other insect management is important with suitable insecticides (Imidacloprid @ 0.5%)
- Anthracnose spots may increase on foliage. Application of Chlorothalonil (0.2%) or Thiophanate methyl (0.2%) or Carbendazim (0.1%) along with sticker (@ 0.5 ml / L) is recommended for the disease management

Banana

- Intensity of Sigatoka leaf spot (*Mycosphaerella* sp.), crown rot (*Fusarium moniliforme* & *Botryodiplodia theobromae*) and anthracnose (*Colletotrichum musae*) of fruits may be increased compared to last fortnight. Sigatoka could be managed by spraying Carbendazim (0.1%) or Thiophanate methyl (0.1%) or Tridemorph (0.1%)/ whereas crown rot and anthracnose could be controlled by the pre-harvest sprays involving Carbendazim (0.1%) or Thiophanate methyl (0.1%), besides post-harvest dip in Chlorine water (300 ppm) for 10 minutes
- Macrophoma spots may appear on the fruits of Robusta varieties of banana. Application of Carbendazim (0.1%) or Thiophanate methyl (0.1%) is recommended for managing the same

Pomegranate

- Intensity of leaf and fruit spot disease caused by *Pseudocercospora punicae* and anthracnose of fruit and leaf (*C. gloeosporioides*) may remain moderate. Application of Chlorothalonil (0.2%) /Antracol (0.2%)/ Carbendazim (0.1%)/ Thiophanate methyl (0.1%)/ Hexaconazole (0.1%) along with the sticker @ 0.5ml/l is effective for the disease control. This will avoid spread of scab disease also. Regular spray of copper oxychloride (0.2%) or Bordeaux mixture (1%) along with streptomycin 0.5g/l is to be continued to avoid spread of nodal blight

Vegetable Crops

Leaf blight of tomato and potato by *Phytophthora infestans*

- Since the rainfall was heavy in the last fortnight, there is higher spread of late blight. If blight has not started, preventive spray of chlorothalonil or copper oxy chloride at 0.2% is recommended. In case of severe infection, spray of fenamidone + dithane M 45 (Sectin) at 0.1% is recommended

Powdery mildew in solanaceous vegetable crops

- Spray of wettable sulphur or dithane M 45 after the appearance of the powdery mildew symptoms. In case of severe infection hexaconazole at 0.1% is recommended

Ornamental crops

- Incidence of rose powdery mildew is expected to increase. In case of severe infection hexaconazole 0.1% or azoxystrobin 0.1% will reduce the disease spread

**CROP WEATHER SITUATION
METEOROLOGICAL DATA OF
ICAR-INDIAN INSTITUTE OF HORTICULTURAL RESEARCH
HESSARAGHATTA LAKE P.O., BANGALORE – 560 089**

Period: 1st to 15th October, 2019

Latitude: 13^o7¹ N

Longitude: 77^o 29¹E

Altitude: 890 M

Fortnight	Temperature (°C)		Relative Humidity (%)		Evaporation (mm)	Wind speed (km/h)	Total Rainfall (mm)
	Average Max.	Average Min.	Average at 7.30AM	Average at 1.30PM			
October 1 st to 15 th , 2019	29.9	19.6	89.3	65.9	5.2	2.85	219.8
	(29.6)	(20.5)	(79.8)	(55.4)	(3.4)	(2.5)	(120.5)

* Figures in the parentheses indicate the average values during the corresponding period for the previous 5 years

Fortnight from 1st to 15th October, 2019

During the first fortnight of the month i.e., from October 1st to 15th, 2019, the average maximum temperature was higher by 0.9^oC and minimum temperature was lower by 0.8^oC respectively, as compared to the previous fortnight. The average maximum temperature was higher by 1.2^oC, whereas the minimum temperature remains the same, respectively, as compared to the average values of the corresponding period for the previous five years. The percent relative humidity during morning and afternoon were lower by 1.3% and 4.5% respectively, as compared to the previous fortnight. There was 219.8mm rainfall during the fortnight.

Crop weather situation

When compared to the last fortnight, the average maximum temperature had increased to the extent of 1.0^oC and the minimum temperature decreased 0.8^oC, respectively. The relative humidity and wind speed decreased, whereas evaporation rate increased. The total rainfall (220 mm) during this period had increased tremendously. Though evaporation rate was high, because of sufficient rainfall no need of supplemental irrigation during this period, but in the upcoming days if there will not be any rainfall, supplemental irrigation is required for crop cultivation. Weather during the fortnight was suitable for the cultivation of *Pleurotus* species. The sporophore induction in *Calocybe* and *Macrocybe* species was delayed by 2-3 days due to low night temperatures. The weather condition was conducive for Spawn running of *Lentinula* species and *Pleurotus eryngi* but sporophore induction required additional cooling.

Incidence of pests and diseases

Under the prevailing weather conditions, the following pests are expected in Bangalore on various horticultural crops. Their management options are mentioned below.

Fruit Crops

Mango shoot borer

- Clip and destroy affected shoots.
- Spray indoxacarb 14.5 SC@ 0.75ml/l or Quinalphos 25 EC @ 2ml/l at the time of emergence of new flush. This will also take care of leaf eating weevil, *Rhynchaenus mangiferae*.

Webber and ash weevil on Mango

- Incidence of webber and ash weevil become serious on new leaves. Remove webbed leaves wherever possible and burn them. Spray quinalphos 25EC @ 2 ml/l or lambda cyhalothrin 5EC @ 1ml /l for their management.

Pomegranate

Fruit sucking moth

- Wherever matured fruits are there fruit sucking moth damage is expected. Netting the orchards is recommended.

Grapes

- Thrips, *Scirtothrips dorsalis* is expected to occur on leaves of newly pruned Bangalore Blue. Spray fipronil 5SC @ 1.5ml/L or Metarhizium formulations.

Vegetable Crops

Fruit fly on cucurbits

- For the management of fruit fly on cucurbits, following integrated approach may be followed. Deployment of cue lure traps @ 10 traps/acre + Sanitation (complete destruction of infested fruits at each harvest) + Bait spray (Deltamethrin 0.1 % + jaggery @ 10g/L) at 10 days interval from the date of flowering.

Tobacco caterpillar on Tomato

- For the management of this pest, spray indoxacarb @ 0.75 ml/L or thiodicarb @ 1 g/L.

Leaf hopper on okra/Bhendi

- Incidence of jassids is observed on okra. Spray imidacloprid 17.8 SL @ 0.3 ml/l, if the crop is at pre-flowering stage. Otherwise, spray neem or pongamia soaps @ 0.5 %, thoroughly covering lower surface of leaves.

Floriculture

Thrips on rose

- Incidence of rose thrips was observed more under polyhouse conditions. Spray acephate 70SP @ 1 g/l or imidacloprid 17.8 SL @ 0.5 ml/l for its management.

Disease Scenario

Disease forecast based on the weather data for first fortnight of October 2019.

Fruit crops

Grapes

- Rust might continue to be noticed in grape vine orchards (var Bangalore Blue) and could be managed by the treatment with Chlorothalonil (0.2%) or Bitertanol (0.2%) or Dinocap (0.3%) + Mancozeb (2%) along with sticker @ 0.5 ml/ L.

Mango

- Sooty mould should be taken care. Application of Copper oxychloride (0.3%) along with sticker (@ 0.5 ml / L) is recommended. Further hopper and other insect management is important with suitable insecticides (Imidacloprid @ 0.5%).
- Anthracnose spots may increase on foliage. Application of Chlorothalonil (0.2%) or Thiophanate methyl (0.2%) or Carbendazim (0.1%) along with sticker (@ 0.5 ml / L) is recommended for the disease management.

Banana

- Intensity of Sigatoka leaf spot (*Mycosphaerella* sp.), crown rot (*Fusarium moniliforme* & *Botryodiplodia theobromae*) and anthracnose (*Colletotrichum musae*) of fruits may be increased compared to last fortnight. Sigatoka could be managed by spraying

Carbendazim (0.1%) or Thiophanate methyl (0.1%) or Tridemorph (0.1%)/ whereas crown rot and anthracnose could be controlled by the pre-harvest sprays involving Carbendazim (0.1%) or Thiophanate methyl (0.1%), besides post-harvest dip in Chlorine water (300 ppm) for 10 minutes.

- *Macrophoma* spots may appear on the fruits of Robusta varieties of banana. Application of Carbendazim (0.1%) or Thiophanate methyl (0.1%) is recommended for managing the same.

Pomegranate

- Intensity of leaf and fruit spot disease caused by *Pseudocercospora punicae* and anthracnose of fruit and leaf (*C. gloeosporioides*) may remain moderate. Application of Chlorothalonil (0.2%) /Antracol (0.2%)/ Carbendazim (0.1%)/ Thiophanate methyl (0.1%)/ Hexaconazole (0.1%) along with the sticker @ 0.5ml/l is effective for the disease control. This will avoid spread of scab disease also. Regular spray of copper oxychloride (0.2%) or Bordeaux mixture (1%) along with streptomycin 0.5g/l is to be continued to avoid spread of nodal blight.

Vegetable Crops

Leaf blight of tomato and potato by *Phytophthora infestans*

- Since the rain fall was heavy during September there is higher spread of late blight. If blight has not started, preventive spray of chlorothalonil or copper oxy chloride at 0.2% is recommended. In case of severe infection, spray of fenamidone + dithane M 45 (Sectin) at 0.1% is recommended.

Powdery mildew in solanaceous vegetable crops

- Spray of wettable sulphur or dithane M 45 after the appearance of the powdery mildew symptoms. In case of severe infection hexaconazole at 0.1% is recommended.

Ornamental crops

- Incidence of rose powdery mildew is expected to increase. In case of severe infection hexaconazole 0.1% or azoxystrobin 0.1% will reduce the disease spread.

**CROP WEATHER SITUATION
METEOROLOGICAL DATA OF
ICAR-INDIAN INSTITUTE OF HORTICULTURAL RESEARCH
HESSARAGHATTA LAKE P.O., BANGALORE – 560 089**

Period: 16th to 31st October, 2019

Latitude: 13^o7¹ N

Longitude: 77^o 29¹E

Altitude: 890 M

Fortnight	Temperature (°C)		Relative Humidity (%)		Evaporation (mm)	Wind speed (km/h)	Total Rainfall (mm)
	Average Max.	Average Min.	Average at 7.30AM	Average at 1.30PM			
October 16 th to 31 st , 2019	27.9	19.9	90.5	78.6	3.0	4.26	104.4
	(28.9)	(18.9)	(71.2)	(47.4)	(4.0)	(2.3)	(49.0)

* Figures in the parentheses indicate the average values during the corresponding period for the previous 5 years

Fortnight from 16th to 31st October, 2019

During the Second fortnight of the month i.e., from October 16th to 31st, 2019, the average maximum temperature was lower by 2.0°C and minimum temperature was higher by 0.3°C, respectively, as compared to the previous fortnight. The average maximum and minimum temperatures were lower by 0.7°C and 1.6°C, respectively, as compared to the average values of the corresponding period for the previous five years. The percent relative humidity during morning and afternoon were higher by 1.2% and 12.7% respectively, as compared to the previous fortnight. There was 104.4 mm rainfall during the fortnight.

Crop weather situation

In the second fortnight of October, the average maximum temperature had decreased by 2.0°C while the minimum temperature increased by 0.3°C as compared to the previous fortnight weather data. The relative humidity and wind speed increased, whereas evaporation rate decreased. The total rainfall (104.4 mm) for this period was 2.1 fold higher than the value for the corresponding period for previous five years. Soil moisture is adequate due to sufficient rainfall received during last fortnight. Top dressing of required nutrients may be done to fruits as well as vegetable crops. Frequent rain and high humidity resulted in leaf spot incidence in papaya and *Phytophthora foot rot* in papaya.

Incidence of pests and diseases

Under the prevailing weather conditions, the following pests were observed in Bangalore on various horticultural crops during Second fortnight of September, 2019. Pest management options are mentioned below.

Fruit Crops

Mango leaf eating caterpillars and weevils

➤ Spray quinalphos 25 EC @ 2 ml/l or lambda cyhalothrin 5EC @ 1ml /l for their management.

Grape thrips

➤ Thrips, *Scirtothrips dorsalis* is expected to occur on leaves of newly pruned Bangalore Blue. Spraying of imidacloprid 17.8 SL @0.3ml/l or thiamethoxam 25G @ 0.25g/l is recommended.

Vegetable Crops

Caterpillar pests on tomato

- During this period, incidence of both tobacco caterpillar and fruit borer is more. For the management of these caterpillar pests spray indoxacarb 14.5 SC @ 0.75ml/l. Collect and destroy *Spodoptera litura* at early instar stage, when they feed gregariously, is desirable.

Mite on tomato

- Incidence of spider mites is noticed in some tomato fields. For mites' management spray spiromesifen 22.9 SC 0.5ml/l.

Thrips on capsicum and chilli

- Incidence of thrips is increasing on capsicum grown under shade net/polyhouses and chilli grown under open conditions. Spray imidacloprid 200 SL @ 0.5 ml/l or fipronil 5SC @ 1.5ml/l.

Jassids on bhendi

- Incidence of jassids is observed on okra. Spray imidacloprid 17.8 SL @ 0.3 ml/l, if the crop is at pre-flowering stage. Otherwise, spray neem or pongamia soaps @ 0.5 %, thoroughly covering lower surface of leaves.

Epilachna beetle on brinjal

- Heavy incidence of epilachna beetle damage is seen on brinjal. Azadirachtin 0.03 % WSP (300 ppm) 5.0 g/l or Quinalphos 20 % AF 1.7 ml/l.

Floriculture

Aphid on rose

- Aphid infestation may increase on rose in open field. Spray Dimethoate 30EC @ 2 ml/l for its management. If the incidence is severe, spray thiamethoxam 25 WG 0.3g/l.

Disease Scenario

Disease forecast based on the weather data for second fortnight of October, 2019

Fruit crops

Grape

- Rust might continue to be noticed in grape vine orchards (var Bangalore Blue) and could be managed by the treatment with Chlorothalonil (0.2%) or Bitertanol (0.2%) or Dinocap (0.3%) + Mancozeb (2%) along with sticker @ 0.5 ml/l.

Mango

- Sooty mould should be taken care. Application of Copper oxychloride (0.3%) along with sticker (@ 0.5 ml / L) is recommended. Further hopper and other insect management is important with suitable insecticides (Imidacloprid @ 0.5%).
- Anthracnose spots may increase on foliage. Application of Chlorothalonil (0.2%) or Thiophanate methyl (0.2%) or Carbendazim (0.1%) along with sticker (@ 0.5 ml / L) is recommended for the disease management.

Pomegranate

- Intensity of leaf and fruit spot disease caused by *Pseudocercospora punicae* and anthracnose of fruit and leaf (*C. gloeosporioides*) may remain moderate. Application of Chlorothalonil (0.2%) /Antracol (0.2%)/ Carbendazim (0.1%)/ Thiophanate methyl (0.1%)/ Hexaconazole (0.1%) along with the sticker @ 0.5ml/l is effective for the disease control. This will avoid spread of scab disease also. Regular spray of copper oxychloride (0.2%) or Bordeaux mixture (1%) along with streptomycin 0.5g/l is to be continued to avoid spread of nodal blight.

Expected Disease Incidence in Vegetable Crops

There has been a dry spell and there are chances for viral diseases transmitted by sucking pests like thrips and aphids. Care should be taken to prevent their population by applying the neem based formulations as per the requirement and crop stage in all crops where vector borne viral disease are expected.

Leaf blight of tomato and potato by *Phytophthora infestans*

- If blight has not started, preventive spray of chlorothalonil or copper oxy chloride at 0.2% is recommended. If there are drizzling due to the depression in east coast followed by rail fall the severity of leaf blight may increase. In case of severe infection, spray of fenamidone + mancozeb at 0.2% is recommended. The water logging has to be avoided to prevent humidity build up. Use of polythene mulch will reduce the secondary spread of the disease through rain flash.

Powdery mildew in solanaceous vegetable crops

- As the minimum temperature has come down and there is cool and dry weather, the powdery mildew will increase. Spray of wettable sulphur or mancozeb at 0.2% after the appearance of the powdery mildew symptoms. In case of severe infection hexaconazole at 0.1% is recommended.

Ornamental crops

- Incidence of rose powdery mildew is expected to increase. In case of severe infection hexaconazole 0.1% or azoxystrobin 0.1% will reduce the disease spread.

**CROP WEATHER SITUATION
METEOROLOGICAL DATA OF
ICAR-INDIAN INSTITUTE OF HORTICULTURAL RESEARCH
HESSARAGHATTA LAKE P.O., BANGALORE – 560 089**

Period: 1st to 15th November, 2019

Latitude: 13^o7¹ N

Longitude: 77^o 29¹E

Altitude: 890 M

Fortnight	Temperature (°C)		Relative Humidity (%)		Evaporation (mm)	Wind speed (km/h)	Total Rainfall (mm)
	Average Max.	Average Min.	Average at 7.30AM	Average at 1.30PM			
November 1 st to 15 th , 2019	29.3	17.8	87.4	56.8	3.83	3.07	10.6
	(27.6)	(18.1)	(76.1)	(48.3)	(3.4)	(1.9)	(35.3)

* Figures in the parentheses indicate the average values during the corresponding period for the previous 5 years

Fortnight from 1st to 15th November, 2019

During the first fortnight of the month i.e., from November 1st to 15th, 2019, the average maximum temperature was higher by 1.4^oC and minimum temperature was lower by 2.1^oC respectively, as compared to the previous fortnight. The average maximum and minimum temperatures were lower by 1.3^oC and 0.8^oC, respectively, as compared to the average values of the corresponding period for the previous five years. The percent relative humidity during morning and afternoon were lower by 3.1% and 21.8% respectively, as compared to the previous fortnight. There was 10.6mm rainfall during the fortnight.

Crop weather situation

The average maximum temperature had increased by 1.4^oC while the minimum temperature decreased by 2.1^oC as compared to the previous fortnight weather data. The relative humidity and wind speed decreased, whereas evaporation rate increased. The total rainfall (10.6 mm) for this period was 3.2 fold lower than the value for the corresponding period for previous five years. Due to high evaporation and diurnal temperature difference, supplemental irrigation may be given to crops to meet their water requirement.

Incidence of pests and diseases

Under the prevailing weather conditions, the following pests are expected in Bangalore on various horticultural crops. Their management options are mentioned below.

Fruit Crops

Mango shoot borer

- Clip and destroy affected shoots.
- Spray indoxacarb 14.5 SC@ 0.75ml/l or Quinalphos 25 EC @ 2ml/l at the time of emergence of new flush. This will also take care of leaf eating weevil, *Rhynchaenus mangiferae*.

Webber and ash weevil on Mango

- Incidence of webber and ash weevil become serious on new leaves. Remove webbed leaves wherever possible and burn them. Spray quinalphos 25EC@ 2 ml/l or lambda cyhalothrin 5EC @ 1ml /l for their management.

Pomegranate

Fruit sucking moth

- Wherever matured fruits are there fruit sucking moth damage is expected. Netting the orchards is recommended.

Grapes

- Thrips, *Scirtothrips dorsalis* is expected to occur on leaves of newly pruned Bangalore Blue. Spray fipronil 5SC @ 1.5ml/L or Metarhizium formulations.

Vegetable Crops

Fruit fly on cucurbits

- For the management of fruit fly on cucurbits, following integrated approach may be followed. Deployment of cue lure traps @ 10 traps/acre + Sanitation (complete destruction of infested fruits at each harvest) + Bait spray (Deltamethrin 0.1 % + jaggery @ 10g/L) at 10 days interval from the date of flowering.

Tobacco caterpillar on Tomato

- For the management of this pest, spray indoxacarb @ 0.75 ml/L or thiodicarb @ 1 g/L.

Leaf hopper on okra/Bhendi

- Incidence of jassids is observed on okra. Spray imidacloprid 17.8 SL @ 0.3 ml/l, if the crop is at pre-flowering stage. Otherwise, spray neem or pongamia soaps @ 0.5 %, thoroughly covering lower surface of leaves.

Floriculture

Thrips on rose

- Incidence of rose thrips was observed more under polyhouse conditions. Spray acephate 70SP @ 1 g/l or imidacloprid 17.8 SL @ 0.5 ml/l for its management.

Disease Scenario

Disease forecast based on the weather data for first fortnight of November 2019.

Fruit crops

Mango

- Powdery mildew requires attention. At this point of time application of wettable sulphur (0.2%) along with sticker @ 0.5 ml/L is recommended. Anthracnose spots may increase on foliage. Application of Chlorothalonil (0.2%) or Thiophanate methyl (0.2%) or Carbendazim (0.1%) along with sticker (@ 0.5 ml / L) is recommended for the disease management.

Papaya

- Infection of Black spot (*Asperisporium caricae*) is increasing. Application of Chlorothalonil (0.2%) Carbendazim (0.1%)/ Thiophanate methyl (0.1%)/ Hexaconazole (0.1%) along with the sticker @ 0.5ml/l with good coverage of the lower surface of the foliage is recommended.

Grape

- Downy mildew and anthracnose need to be monitored. For the management of downy mildew application of Metalaxyl + Mancozeb (0.2%)/ Al Fosetyl (0.2%)/ Dimethomorph (0.8%) + Mancozeb (0.2%) and for anthracnose spraying with Propineb (0.2%)/ Chlorothalonil (0.2%)/ Carbendazim (0.1%)/ Thiophanate methyl (0.1%) are effective.
- Rust might continue to be noticed in grape vine orchards (var Bangalore Blue) and could be managed by the treatment with Chlorothalonil (0.2%) or Bitertanol (0.2%) or Dinocap (0.3%) + Mancozeb (2%) along with sticker @ 0.5 ml/ l.

Banana

- Sigatoka leaf spot (*Mycosphaerella* sp.), crown rot (*Fusarium moniliforme* & *Botryodiplodia theobromae*) and anthracnose (*Colletotrichum musae*) of fruits require proper attention. Sigatoka could be managed by spraying Carbendazim (0.1%) or Thiophanate methyl (0.1%) or Tridemorph (0.1%)/ whereas crown rot and anthracnose could be controlled by the pre-harvest sprays involving Carbendazim (0.1%) or Thiophanate methyl (0.1%), besides post-harvest dip in Chlorine water (300 ppm) for 10 minutes.
- *Macrophoma* spots may appear on the fruits of Robusta varieties of banana. Application of Carbendazim (0.1%) or Thiophanate methyl (0.1%) is recommended for managing the same.

Vegetable crops

Solanaceous and cucurbits vegetables

- Powdery mildew requires attention. At this point of time application of wettable sulphur (0.2%) along with sticker @ 0.5 ml/L is recommended.
- Leafspots and Anthracnose spots may increase on foliage. Application of Chlorothalonil (0.2%) along with sticker (@ 0.5 ml / L) is recommended for the disease management.

Ornamental crops

Chrysanthemum

- This is the time for rust and spraying Chlorothalonil (2g/l) or mycoblutanol (2g/l) as contact fungicide will reduce the incidence. In severe cases, propiconazole (1.5 ml/l) will help in preventing the further spread of the disease.

Rose

- Now the powdery mildew incidence will increase. Spray of azoxystrobin at 0.05% or trifloxystrobin + tebuconazole at 0.1% will reduce the powdery mildew spread.

**CROP WEATHER SITUATION
METEOROLOGICAL DATA OF
ICAR-INDIAN INSTITUTE OF HORTICULTURAL RESEARCH
HESSARAGHATTA LAKE P.O., BANGALORE – 560 089**

Period: 16th to 30th November, 2019

Latitude: 13°7' N

Longitude: 77° 29'E

Altitude: 890 M

Fortnight	Temperature (°C)		Relative Humidity (%)		Evaporation (mm)	Wind speed (km/h)	Total Rainfall (mm)
	Average Max.	Average Min.	Average at 7.30AM	Average at 1.30PM			
November 16 th to 30 th , 2019	28.1	18.3	86.5	64.3	3.9	4.94	4.6
	(27.3)	(18.0)	(77.5)	(47.8)	(3.1)	(2.1)	(12.1)

* Figures in the parentheses indicate the average values during the corresponding period for the previous 5 years

Fortnight from 16th to 30th November, 2019

During the Second fortnight of the month i.e., from November 16th to 30th, 2019, the average maximum temperature was lower by 1.2°C and minimum temperature was higher by 0.5°C, respectively, as compared to the previous fortnight. The average maximum and minimum temperatures were lower by 0.3°C and 0.1°C, respectively, as compared to the average values of the corresponding period for the previous five years. The percent relative humidity during morning was lower by 0.9% and during afternoon it was higher by 7.5% respectively, as compared to the previous fortnight. There was 4.6 mm rainfall during the fortnight.

Crop weather situation

In the second fortnight of November, the average maximum temperature had increased by 0.8°C and the minimum temperature increased by 0.3°C as compared to the previous five years' weather data. The relative humidity, wind speed and evaporation rate have also increased as compared to the previous five years' weather data. The total rainfall (4.6 mm) for this period was 2.6 fold lower than the value for the corresponding period for previous five years. Soil moisture is inadequate due to insufficient rainfall received during last fortnight, watering may be given to fruit and vegetable crops as per the crop requirement. Top dressing of required nutrients may be done to fruits as well as vegetable crops. The weather during the second fortnight of November was suitable for cultivation oyster mushroom, shiitake mushroom and King oyster mushroom with little additional cooling.

Incidence of pests and diseases

Under the prevailing weather conditions, the following pests were observed in Bangalore on various horticultural crops during Second fortnight of November, 2019. Pest management options are mentioned below.

Fruit Crops:

Hoppers on mango:

- Wherever flowering started, incidence of hoppers is expected to occur on mango. Spray Azadirachtin 3000 ppm @ 2 ml/l, if the hopper population is low to moderate. If the number

exceeds 4 per panicle spray with imidacloprid 200 SL @ 0.25 ml/l. If blossom webber is noticed, spray lambda cyhalothrin 5 EC @ 0.5 ml/l at early panicle emergence. Add stickers for enhancing the efficacy. Also direct the sprays to the trunks to check hibernating adults of stone weevils and hoppers.

Vegetable Crops:

Cabbage Diamond back moth:

- Occurring in severe form. Spraying of neem soap (10g/L), neem seed powder extract @ 40g/litre at 10 days' intervals will be effective.

Tomato fruit borer:

- With the prevailing weather, incidence of tomato fruit borer may increase on tomato. For its management, spray *HaNPV* @ 250 LE/ha during evening hours or spray indoxacarb 14.5 SC @ 0.75ml/l, if the incidence is very high. Proper waiting periods are to be followed before harvest of tomatoes.

Midge on chillies:

- Severe incidence of midges is observed on chilli which causes maximum damage at flowering stage. Spray thiamethoxam 70WG@ 0.3 g/l for their management.

Aphids on cucurbits

- Aphid infestation may increase on different cucurbits. Spray imidacloprid 17.8 SL @ 0.5 ml/l for their management.

Disease Scenario

Disease forecast based on the weather data for second fortnight of November, 2019

Fruit crops

Mango

- Powdery mildew requires attention. At this point of time application of wettable sulphur (0.2%) along with sticker @ 0.5 ml/L is recommended. Anthracnose spots may increase on foliage. Application of Chlorothalonil (0.2%) or Thiophanate methyl (0.2%) or Carbendazim (0.1%) along with sticker (@ 0.5 ml / L) is recommended for the disease management.

Papaya

- Infection of Black spot (*Asperisporium caricae*) is increasing. Application of Chlorothalonil (0.2%) Carbendazim (0.1%)/ Thiophanate methyl (0.1%)/ Hexaconazole (0.1%) along with the sticker @ 0.5ml/l with good coverage of the lower surface of the foliage is recommended.

Banana

- Sigatoka leaf spot (*Mycosphaerella* sp.), crown rot (*Fusarium moniliforme* & *Botryodiplodiatheobromae*) and anthracnose (*Colletotrichum musae*) of fruits require proper attention. Sigatoka could be managed by spraying Carbendazim (0.1%) or Thiophanate methyl (0.1%) or Tridemorph (0.1%)/ whereas crown rot and anthracnose could be controlled by the pre-harvest sprays involving Carbendazim (0.1%) or Thiophanate methyl (0.1%), besides post-harvest dip in Chlorine water (300 ppm) for 10 minutes.

Grape

- Downy mildew and anthracnose needs to be monitored. For the management of downy mildew application of Metalaxyl + Mancozeb (0.2%)/ Al Fosetyl (0.2%)/ Dimethomorph (0.8%) + Mancozeb (0.2%) and for anthracnose spraying with Propineb (0.2%)/ Chlorothalonil (0.2%)/ Carbendazim (0.1%)/ Thiophanate methyl (0.1%) are effective.

Vegetable crops

Solanaceous and cucurbits vegetables

- Powdery mildew requires attention. At this point of time application of wettable sulphur (0.2%) along with sticker @ 0.5 ml/L is recommended. Later, if incidence is in serious proportion spraying of hexaconazole at 0.1% will reduce the spread.
- Leafspots and Anthracnose spots may increase on foliage. Application of Chlorothalonil (0.2%) along with sticker (@ 0.5 ml / L) is recommended for the disease management.

Floriculture

Chrysanthemum

- This is the time for rust and spraying Chlorothalonil (2g/l) or mycoblutanol (2g/l) as contact fungicide will reduce the incidence. In severe cases propiconazole (1.5 ml/l) will help in preventing the further spread of the disease.

**CROP WEATHER SITUATION
METEOROLOGICAL DATA OF
ICAR-INDIAN INSTITUTE OF HORTICULTURAL RESEARCH
HESSARAGHATTA LAKE P.O., BANGALORE – 560 089**

Period: 1st to 15th December, 2019

Latitude: 13⁰7¹ N

Longitude: 77⁰ 29¹E

Altitude: 890 M

Fortnight	Temperature (°C)		Relative Humidity (%)		Evaporation (mm)	Wind speed (km/h)	Total Rainfall (mm)
	Average Max.	Average Min.	Average at 7.30AM	Average at 1.30PM			
December 1 st to 15 th , 2019	26.2	16.9	86.9	69.2	2.81	5.62	2.7
	(26.6)	(18.1)	(78.1)	(52)	(2.6)	(2.8)	(16.2)

* Figures in the parentheses indicate the average values during the corresponding period for the previous 5 years

Fortnight from 1st to 15th December, 2019

During the first fortnight of the month i.e., from December 1st to 15th, 2019, the average maximum and minimum temperatures was lower by 1.9°C and 1.4°C respectively, as compared to the previous fortnight. The average maximum temperature was lower by 0.7°C and minimum temperature was higher by 0.1°C, respectively, as compared to the average values of the corresponding period for the previous five years. The percent relative humidity during morning and afternoon were higher by 0.4% and 4.9% respectively, as compared to the previous fortnight. There was 2.7mm rainfall during the fortnight.

Crop weather situation

The average maximum temperature had decreased by 0.7°C and the minimum temperature increased by 0.1°C as compared to the previous five years' weather data. The relative humidity, wind speed increased and evaporation rate increased. The total rainfall (2.7 mm) for this period was nearly 6 fold lower than the value for the corresponding period for previous five years. When compared to last fortnight the average maximum and minimum temperature had decreased by 1.9°C and 1.4°C, respectively. Moreover, amount of rainfall has also decreased. Therefore, soil moisture is inadequate due to insufficient rainfall supplemental irrigation may be given to meet

the water requirement of the crop. The weather during the first fortnight of December was suitable for cultivation of *Pleurotus* species, *Lentinula* species, and *Agrocyde* species of mushroom.

Incidence of pests and diseases

Pest forecast and their management based on the weather data for the first fortnight of December, 2019.

Fruit Crops

Hoppers on mango:

- Wherever flowering started, incidence of hoppers is expected to occur on mango. Spray Azadirachtin 3000 ppm @ 2 ml/l, if the hopper population is low to moderate. If the number exceeds 4 per panicle spray with imidacloprid 200 SL @ 0.25 ml/l. If blossom webber is noticed, spray lambda cyhalothrin 5 EC @ 0.5 ml/l at early panicle emergence. Add stickers for enhancing the efficacy.

Vegetable Crops

Tomato fruit borer:

- With the prevailing weather, incidence of tomato fruit borer may increase on tomato. For its management, spray *HaNPV* @ 250 LE/ha during evening hours or spray indoxacarb 14.5 SC @ 0.5ml/l, if the incidence is very high. Proper waiting periods are to be followed before harvest of tomatoes.

Midge on chillies:

- Severe incidence of midges is observed on chilli which causes maximum damage at flowering stage. Spray thiamethoxam 25 WG @ 0.3 g/l for their management.

Thrips on capsicum and chilli

- Incidence of thrips is increasing on capsicum grown under shade net/polyhouses and chilli grown under open conditions. Spray imidacloprid 200 SL @ 0.5 mL/l or fipronil 5 SC @ 1.5 ml/l.

Aphids on cucurbits

- Aphid infestation may increase on different cucurbits. Spray imidacloprid 200SL @ 0.5 ml/l for their management.

Disease Scenario

Disease forecast and their management based on the weather data for the first fortnight of December, 2019.

Fruit crops

Mango

- Powdery mildew requires attention. At this point of time application of wettable sulphur (0.2%) along with sticker @ 0.5 ml/L is recommended. Wettable Sulphur should not be applied if the temperature is higher. Anthracnose spots may increase on foliage. Application of Chlorothalonil (0.2%) or Thiophanate methyl (0.2%) or Carbendazim (0.1%) along with sticker (@ 0.5 ml / L) is recommended for the disease management.

Papaya

- Infection of Black spot (*Asperisporium caricae*) is increasing. Application of Chlorothalonil (0.2%) Carbendazim (0.1%)/ Thiophanate methyl (0.1%)/ Hexaconazole (0.1%) along with the sticker @ 0.5ml/l with good coverage of the lower surface of the foliage is recommended.

Grape

- Downy mildew and anthracnose are important diseases in this period. For the management of downy mildew application of Metalaxyl + Mancozeb (0.2%)/ Al Fosetyl (0.2%)/ Dimethomorph (0.8%) + Mancozeb (0.2%) and for anthracnose spraying with Propineb (0.2%)/ Chlorothalonil (0.2%)/ Carbendazim (0.1%)/ Thiophanate methyl (0.1%) are effective.

Banana

- Sigatoka leaf spot (*Mycosphaerella* sp.), crown rot (*Fusarium moniliforme* & *Botryodiplodia theobromae*) and anthracnose (*Colletotrichum musae*) of fruits require proper attention. Sigatoka could be managed by spraying Carbendazim (0.1%) or Thiophanate methyl (0.1%) or Tridemorph (0.1%)/ whereas crown rot and anthracnose could be controlled by the pre-harvest sprays involving Carbendazim (0.1%) or Thiophanate methyl (0.1%), besides post harvest dip in Chlorine water (300 ppm) for 10 minutes.

Pomegranate

- Intensity of leaf and fruit spot disease caused by *Pseudocercospora punicae* and anthracnose of fruit and leaf (*C. gloeosporioides*) may remain moderate. Application of Chlorothalonil (0.2%) /Antracol (0.2%)/ Carbendazim (0.1%)/ Thiophanate methyl (0.1%)/ Hexaconazole (0.1%) along with the sticker @ 0.5ml/l is effective for the disease control.

Vegetable crops

Solanaceous vegetables

- Powdery mildew requires attention. At this point of time application of wettable sulphur (0.2%) along with sticker @ 0.5 ml/L is recommended. Leafspots and Anthracnose spots may increase on foliage. Application of Chlorothalonil (0.2%) along with sticker (@ 0.5 ml / L) is recommended for the disease management.

Cucurbits vegetables

- Powdery mildew may become problem. Application of chlorothalonil (0.2%) as preventive spray and tebuconazole (0.1%) at severe stages may help. For the downy mildews spray of ridomil 0.1% will help.

Ornamental crops

Chrysanthemum

- This is the time for rust and spraying chlorothalonil at 2g/l will prevent the disease incidence. While propiconazole at 0.1% will help as curative measure.

Rose

- Powdery mildew of rose in polyhouse as well as field grown crops will increase. Tebuconazole or hexaconazole (at 0.1%) or azoxystrobin at 0.05% would reduce the disease severity.

**CROP WEATHER SITUATION
METEOROLOGICAL DATA OF
ICAR-INDIAN INSTITUTE OF HORTICULTURAL RESEARCH
HESSARAGHATTA LAKE P.O., BANGALORE – 560 089**

Period: 16th to 31st December, 2019

Latitude: 13^o7¹ N

Longitude: 77^o 29¹E

Altitude: 890 M

Fortnight	Temperature (°C)		Relative Humidity (%)		Evaporation (mm)	Wind speed (km/h)	Total Rainfall (mm)
	Average Max.	Average Min.	Average at 7.30AM	Average at 1.30PM			
December 16 th to 31 st , 2019	28.2	16.5	89.5	65.4	3.4	4.8	0.00
	(28.2)	(16.1)	(75.4)	(45.0)	(3.8)	(2.9)	(0.0)

* Figures in the parentheses indicate the average values during the corresponding period for the previous 5 years

Fortnight from 16th to 31st December, 2019

During the Second fortnight of the month i.e., from December 16th to 31st, 2019, the average maximum temperature was increased by 2.0°C and minimum temperature was lower by 0.4°C, respectively, as compared to the previous fortnight. The average maximum temperature increased by 1.6°C and the minimum temperature decreased by 2.0°C as compared to average values of the corresponding period for the previous five years. The percent relative humidity during morning was higher by 2.6% and afternoon was lower by 3.8% respectively, as compared to the previous fortnight. There was no rainfall during the fortnight.

Crop weather situation

The average maximum temperature increased by 2.0°C and the minimum temperature decreased by 0.4°C as compared to the previous fortnight values. Rainfall was less and evaporation rate was increased. Therefore, soil moisture is inadequate due to insufficient rainfall supplemental irrigation may be given to meet the water requirement of the crop. Further, during this period Relative Humidity and Wind speed had increased when compared to the average values of previous five years. Due to high humidity and wind speed, chances of occurring diseases and their spread will be more, so proper control measures to be followed to avoid the disease problems in crops. The weather of the second fortnight was suitable for cultivation of *Pleurotus* species, *Lentinula* species and *Agrocyde* species.

Incidence of pests and diseases

Under the prevailing weather conditions, the following pests were observed in Bangalore on various horticultural crops during Second fortnight of December, 2019. Pest management options are mentioned below.

Fruit Crops

Guava

- In guava tea mosquito bug incidence was observed on new flush. It can be managed by spraying with Lambda cyhalothrin @ 0.6ml/L.

Vegetable Crops

Tomato

- Population buildup of tomato fruit borer, *Tuta absoluta* was noticed both in polyhouse and open field condition and can be managed by spraying Spinosad @0.3ml/ or Spinetoram @1 ml/L.

Floriculture

Rose

- Aphids infestation was observed, can be minimized by spraying Spinosad @0.25 ml/L.

Gerbera

- Under polyhouse conditions in gerbera crop thrips incidence is severe. Recommended to spray spinosad@0.25 ml/L.

*Safe waiting periods are to be followed as per the label claims

Disease Scenario

Disease forecast based on the weather data for second fortnight of December, 2019.

Fruit crops

Mango

- Powdery mildew requires attention. At this point of time application of wettable sulphur (0.2%) along with sticker @ 0.5 ml/L is recommended. Anthracnose spots might further increase on foliage. Application of Chlorothalonil (0.2%) or Thiophanate methyl (0.2%) or Carbendazim (0.1%) along with sticker (@ 0.5 ml / L) is recommended for the disease management.
- Sooty mould should be still taken care. Application of Copper oxychloride (0.3%) along with sticker (@ 0.5 ml / L) is recommended. Further hopper and other insect management is important with suitable insecticides (Imidacloprid @ 0.5%).

Papaya

- Infection of Black spot (*Asperisporium caricae*) may further increase. Whereas powdery mildew (*Oidium caricae*) infection may also be noticed Application of Chlorothalonil (0.2%) Carbendazim (0.1%) / Thiophanate methyl (0.1%) / Hexaconazole (0.1%) along with the sticker @ 0.5ml/l with good coverage of the lower surface of the foliage is recommended.

Grape

- Anthracnose and Powdery mildew infection are supposed to increase may be noticed. For anthracnose application of Chlorothalonil (0.2%) or Bitertanol (0.2%) or Dinocap (0.3%) + Mancozeb (2%) or thiophanate methyl (0.1%) whereas for powdery mildew Application of Myclobutanil (0.1%) or Triadimefon (0.1%) along with sticker @ 0.5 ml/ l is recommended for the management of disease.

Banana

- Sigatoka leaf spot (*Mycosphaerella* sp.), crown rot (*Fusarium moniliforme* & *Botryodiplodia theobromae*) and anthracnose (*Colletotrichum musae*) Macrophoma fruit spot disease needs proper attention. Sigatoka could be managed by spraying Carbendazim (0.1%) or Thiophanate methyl (0.1%) or Tridemorph (0.1%) / whereas crown rot, anthracnose and Macrophoma fruit spot disease (Specially on var. Grand Naine) could be controlled by the pre-harvest sprays involving Carbendazim (0.1%) or Thiophanate methyl (0.1%), besides post harvest dip in Chlorine water (300 ppm) for 10 minutes.

Pomegranate

- Intensity of leaf and fruit spot disease and anthracnose of fruit and leaf may increase further. Application of Chlorothalonil (0.2%) /Antracol (0.2%) / Carbendazim (0.1%) / Thiophanate methyl (0.1%) / Hexaconazole (0.1%) along with the sticker @ 0.5ml/l is effective for the disease control.

Vegetable crops

Crucifers

Powdery mildew

- Spray wettable sulphur or tebuconazole at 0.2% at the beginning of the infection with sticker at 0.5ml per l of spray liquid with good coverage of the lower surface of the leaves.

Tomato

Powdery mildew

- Spray hexaconazole or tebuconazole 0.2% at the beginning of the infection with sticker as mentioned earlier.

Floriculture & Medicinal

Rose

Powdery mildew

- Spray with azoxystrobin at 0.05% with sticker as mentioned above.

Black spot

- Spray mancozeb 0.2% at the initial stages and trifloxystrobin or propiconazole (0.1%) if infection is severe at later stages.

Betel vine

Powdery mildew

- Spray wettable sulphur at 0.2%. spray of systemic fungicides not recommended. Maintenance of good aeration and proper drainage are important.