

NATIONAL

ADVISORY

Floriculture



ICAR-DFR, Research Farm, Hadapsar, Pune 2019

ICAR- Directorate of Floricultural Research
College of Agriculture Campus, Shivajinagar
Pune 411005



भारत सरकार - कृषि विभाग
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N A T I O N A L

A D V I S O R Y

Floriculture

*Advisory to Flower Growers
in the light of COVID 19 pandemic.*

Compiled by : Team ICAR-DFR, Pune

Contributed by : Team-AICRP-Floriculture

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**ICAR- Directorate of Floricultural Research
College of Agriculture Campus, Shivajinagar
Pune 411005**



Advisory to Flower Growers in the light of COVID-19 pandemic



All the flower growers are requested to follow the guidelines issued from time to time by the Ministry of Health and Family Welfare and Ministry of Home Affairs, GoI as well as guidelines from respective State Governments for the effective containment of Corona (COVID19).

At present every sector is facing hardship due to the pandemic and floriculture sector is not an exception. It is expected that situation would change for better in coming months.

In view of the transport restrictions, cancellation of railways, cancellation of domestic flights the movement of flowers has been greatly impacted. The supply chain is completely disrupted. The major consumption avenues have dwindled forcing the farmers to take desperate measures.

We urge the farmers not to loose hope in this testing times. We request them to prepare for the ensuing season by taking timely measures after the lockdown.

This advisory is prepared with the inputs from all the AICRP on Floriculture centers spread across the country addressing the measures to be taken. The advisory also contains the guidelines for the farmers, Arogya Setu App, Kisan Rath App, Exemption during lockdown, dry flower technology, gulkand making besides state wise general and crop specific advises.

We place on record our deep sense of gratitude for constant support, encouragement and leadership provided by Honorable Secretary DARE and DG-ICAR Dr.Trilochan Mohapatra in all our endeavors.

We are equally indebted to Honorable Deputy Director General (HS) Dr. A.K.Singh, for his guidance, commitment, unwavering support and stewardship provided from time to time.

Our sincere acknowledgements are due to Dr.T.Janakiram, Assistant Director General (HS I) for his committed involvement, constant help and valuable advises.

We acknowledge the active participation of all the project workers of AICRP on Floriculture in this endeavor with timely inputs.

Team -ICAR-DFR, Pune

National Advisory for Floricultural Crops

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Advisory for Maharashtra **ICAR-Directorate of Floricultural Research, Pune**

All the flower growers are requested to follow the guidelines issued from time to time by the Ministry of Health and Family Welfare and Ministry of Home Affairs, GoI as well as guidelines from respective State Governments for the effective containment of Corona (COVID19).

Floriculture sector is also badly affected as any other sector in view of COVID 19 pandemic. With religious places closed, weddings postponed, major events in public sector and private sector differed, no major social and religious functions lined up farmers are facing hardship to market their produce. Flower consumption has come to a standstill as flowers are at the fag end of the list of essentials even for the consumers. Many of farmers are discarding the flowers in view of the unprecedented situation. The phenomenon is not unique to India as reports suggest that even in global auction houses located in the Netherlands have resorted to such desperate measures (https://www.facebook.com/hashtag/buyflowersnottoiletpaper?source=feed_text&epa=HASHTAG&tn=*NK-R).

With the onset of summer, one major advantage at this point of time in India is that the major production season is over except for off season production and some perennial flowers in hills and certain plains.

At present every sector is facing hardship due to the pandemic and floriculture sector is not an exception. It is expected that situation would change for better in coming months.

The Directorate of Floricultural Research, Pune offers the following advisory to the farming fraternity.

General Advisory

- Harvesting in majority of the seasonal flowers is getting over with the onset of summer months.
- For many crops, the season is not so demanding in terms of resources with few exceptions (crops like tuberose, jasmine, crossandra, nursery industry, etc). Hence, employment of labour may be kept at minimum essential for maintenance.
- As it is lean period for many flower crops, the incidence of insect pests/diseases would be minimum.
- Summer showers with strong gales are likely in the next two months. Nursery growers are advised to take enough precautions to protect their nursery stock by adequately strengthening the growing structures.
- New activities (planting, nursery raising (seed propagated crops), plant multiplication (vegetative propagation) may be deferred. Only maintenance activities (irrigation, weeding, plant protection sprays, if any as per the need, etc) may be continued with minimum labour.

- In case of bulbous crops (gladiolus, tuberose, etc), lifting, treating (fungicide), drying and storage of bulbs is important but not an immediate requirement. Hence, these may be attended as and when there is relief from the lockdown.
- It would be a good idea to dry flowers that are colourful (rose, marigold, chrysanthemum and China aster) instead of discarding the flowers. The dried petals could be used to make eco-friendly *gula* for later use.
- High temperature coupled with low relative humidity often encourages spider mite incidence. Application of miticide (Abamectin) would control the mites. Further application of 1% neem oil also helps to a great extent. Regular irrigation would increase the relative humidity and reduce the multiplication of the mites.

Crop-wise advisory

Tuberose

- March – April is the right time of planting this crop. Planting, however, can be deferred till June-July. In case the bulbs are lifted, dipping of tuberose bulbs in *Bacillus subtilis* – 1 % W.P. suspension followed by soil application of 5 tons/ ha of FYM enriched with *B. subtilis* (5 kg) will be helpful for the management of nematodes. Please go for application of any nematicide (pre-plant incorporation) before planting.
- Upon favourable conditions, start preparing the land by deep ploughing and expose the soil for soil solarisation.
- For standing crops, life saving irrigation and weeding should be taken up. Dried/withered spikes need to be removed.
- For the control of leaf blight and stem rot Azoxystrobin (@0.3 ml/l) and Difenconazole (@0.5 ml/l) are found effective.

Jasmine

- This is the season for Jasmine (especially for *J. sambac* and *J. grandiflorum*). Provide adequate irrigation and recommended nutrition.
- Bud borer infestation in some of the areas could be managed by spraying contact insecticide.
- Care should be taken for the control of insect pests/diseases, as and when required.

Gladiolus

- Flower harvesting is complete in most of the areas. Except in hills.
- Lifting of bulbs, their treatment and storage needs to be taken care upon the improvement of labour availability.
- Till such time the corms can remain in the soil.
- There is adequate time for fresh planting of gladiolus.

Chrysanthemum

- In the standing crop (mother block) pruning the dried & unwanted shoots, top-dressing with nitrogenous fertilizers, life saving irrigation and weed control are to be taken up.
- In off-season crop, irrigation, weed management and inter-culture (pinching/disbudding) needs to be taken care.
- Upon the improvement of the situation, prepare the land by deep ploughing and expose the soil for solarisation.
- Cut back all the branches and irrigate to encourage the sucker production. Top cuttings can be taken from the suckers after one month.

Rose

- Summer showers may result in fungal incidence, hence please go for prophylactic spray of fungicides (carbendazim). Hot and dry climate is favourable for the incidence of spider mites. Application of miticide (Abemectin 1.9EC) would control the mites. Regular irrigation would increase the relative humidity and reduce the multiplication of the mites.
- Farmers who are growing desi roses may prepare *gulkand* instead of discarding the flowers.
- Un-harvested flowers on the plants may become the site of fungal attack, hence, dried/withered flowers may be removed from the plants.

China aster and Marigold

- In most places the flower production might have been completed as the season is over. However, in those areas where harvesting is not yet done, farmers may go for collecting the seed (from best performing individual plants) for self use in the next season and also for distribution to others.

Annuals

- Seed collection, processing and storage is an important activity upcoming in many summer season annuals and also in late sown winter annuals
- Allow the flowers to completely dry and collect the flowers/seeds when the situation improves.
- Cleaning, processing of the seed could be taken up upon the improvement of the situation.

Cut Flowers

In order to recover some of the production costs the following avenues could be explored by **greenhouse growers**.

It is advisable to avoid feeding the cattle owing to pesticide residue on the greenhouse produce.

Rose

Rose growers may be advised to force bending in the existing plantation to encourage new flush to resume the production after about 45 days. It is presumed that the situation might improve by then.

Propagation by budding/grafting to replenish the loss of planting material and possible sale after the situation improves.

i. Varieties with mild fragrance

- Rose petals could be sun-dried and can be used in the confectionary, sweets, ice creams and bakery later.
- Dried petals could be ground and the powder could be used for making *agarbattis*.
- Petals could be used for making *gulkand*

ii. Varieties with no fragrance

- Rose petals could be sun-dried and can be ground to make eco-friendly *gulal* and *agarbatti*

iii. Flower buds could be embedded in resins to make souvenirs.

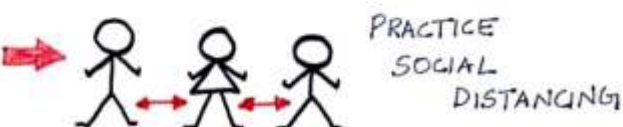
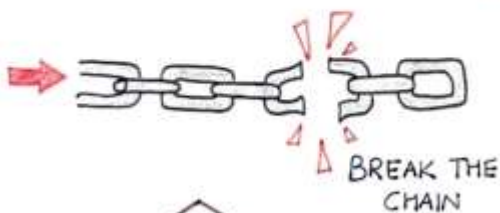
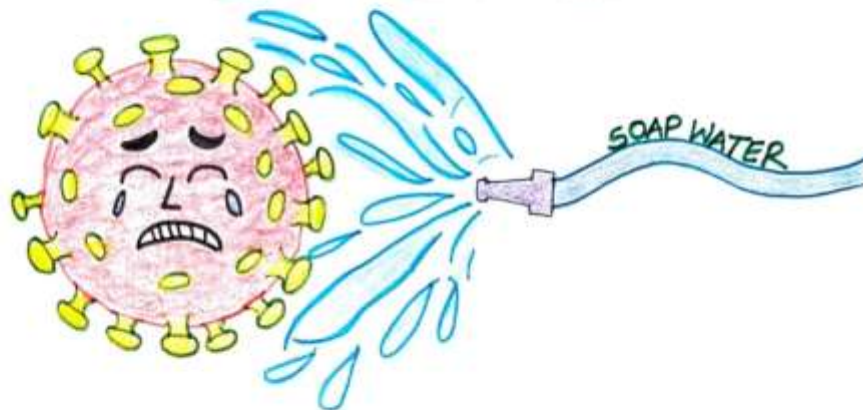
iv. Convert rest of the biomass as compost which could be ploughed back or can be sold. (waste to wealth)

Other cut flowers like Gerbera, carnation, liliium, orchid and anthurium could be dried as whole by embedding in silica gel or borax for later use in value added products.

Covid 19

Its our collective responsibility to prevent the spread of the pandemic by following the guidelines of Government of India and the respective state Governments including social distancing which helps in braking the infection cycle, staying at home during lock down and frequent washing of hands.

How To FIGHT COVID 19



COVID 19
FORGET YOUR
CORDONATION!



WE WILL
DEFEAT
YOU!

K·A·ANANYA 7-SIRIUS

Guidelines for Farmers

Guidelines for Prevention of Covid 19 (Corona) spread during Crop Harvesting and Threshing

In view of spread of Covid 19 (Corona) virus across country, the following guidelines are issued for crop harvesting and threshing during Kharif 2020 to protect health of farmers and farm workers and to contain the spread of the virus through these agricultural operations to consumers.

- Harvesting of crops should be done through mechanized harvesters as far as possible to involve less farm workers in the field. If harvesting is to be done by hand operated equipments like sickles etc., sanitize these with soap water at least three times a day.
- During harvesting, social distancing has to be compulsorily maintained. A person to person distance of at least 1-2 meters must be maintained while harvesting the crop, eating meals or other wise. Each worker should have separate utensils for eating and clean these with soap after use.
- Every farm worker has to bring his separate bottles/utensils for drinking water and these should not be shared with others.
- Every worker must bring his implements or be provided with separate implements and workers should never be allowed to exchange the implements.
- During the harvesting operations, workers should wash hands intermittently and avoid touching nose, mouth and eyes without washing.
- Farmers must ensure availability of soap and clean water in ample quantity at farm.
- Wearing of mask during farm operations is mandatory. In the absence of mask, use chunnis, gamchas, towels or other fine clothes and cover nose and mouth with three folds of these. The traditional practice of covering nose and mouth with suitable clothes during farm operations will be useful here also.
- All the clothes used for a day, should not be worn next day. These clothes should be washed with soap and sun dried before use next time.
- If a person is having cough, running nose, fever and head-ache, he needs to be isolated and send to the doctor/dispensary for medical check up. He/She should not be involved in the operation and kept separately.
- Similar to harvesting, all the precautions relating to social distancing, sanitizing, cleanliness, use of mask etc. have to be strictly adhered to during threshing also.

- Ensure that farm produce does not come in contact with land/soil. No one should spit on the surface near threshing.
- Transport and agricultural machinery like tractor, mini-tractor, trolley, combine harvester, thresher, other small equipments, container, plastic sheet/tripal, gunny bags etc. should be properly sanitized before use.
- Workers/farmers must wear mask, clean hands with soap, wear gloves and maintain social distancing during packaging of fruit and vegetables.
- Proper sanitization of containers (crates, papers, bags, ropes) for packaging of fruit and vegetables has to be compulsory carried out. Fruits and vegetables need to be washed properly with clean water before packing.
- Cut and damaged fruits/vegetables should be kept separately and should not be packed.
- Farmers must properly sanitize common toilets and wash basins for use of workers.
- Farm produce should be kept outside for 48 hours preferably in sunshine before storage in home.

In addition, common guidelines issued for the region by local authorities to contain spread of Corona and general hygiene procedures need to be adhered strictly.

Source : Ministry of Agriculture and Farmers Welfare



Chrysanthemum diversity at ICAR-DFR, Pune

Lockdown 2.0 : Exempted Services



LOCKDOWN 2.0

Cargo & Essential Services Allowed after April 20

#IndiaFightsCorona

Cargo Services



Transportation of cargo (Inter & intra State) by air, rail, land & sea routes



Carrier vehicles allowed with two drivers & one helper; empty vehicles for delivery/pick up of goods

Essential Services



Supply chain of essential goods like manufacturing, wholesale, retail; shops/carts for essential goods



Large brick & mortar stores; dhabas & truck repair shops on highway; movement of staff & labourers for essential services



LOCKDOWN 2.0

Movement of Persons Allowed after April 20

#IndiaFightsCorona



Private vehicles for medical emergency services & for procuring essential commodities



In case of 4-wheeler, one passenger in back seat besides the driver is permitted



In case of 2-wheelers, only driver of the vehicle is permitted



All personnel travelling to work place as exempted by State/ UT/ local authority



LOCKDOWN 2.0

Public Utilities Allowed after April 20

#IndiaFightsCorona



Online educational services including teaching, training & coaching



MNREGA works, priority to irrigation & water conservation, workers to use face masks & observe social distancing



Operations of O&G, power, postal services, water, sanitation, waste management, telecom & internet services



LOCKDOWN 2.0

Agriculture Services Allowed after April 20

#IndiaFightsCorona



Farming operations in field; agencies engaged in procurement of agri products



Machinery shops, Custom Hiring Centers, services related to fertilizers & seeds



APMC Mandis, direct marketing operations; harvesting & sowing



Operation of fishing like processing & sale; hatcheries, commercial aquaria



Plantations of tea, coffee & rubber allowed with maximum of 50% workers



Animal Husbandry including distribution & sale of milk products, animal shelter homes, etc.

Lockdown 2.0 : Exempted Services



LOCKDOWN 2.0

Financial & Social Services Allowed after April 20

#IndiaFightsCorona



Financial Sector



RBI and RBI regulated financial markets & entities, Banks, ATMs, IT vendors for banking operations



SEBI and capital & debt market services; IRDAI and Insurance companies

Social Sector



Homes for children, divyans, elderly, etc. including observation homes & after care homes



Disbursement of social security pensions & provident fund by EPFO; Operation of Anganwadis



LOCKDOWN 2.0

Commercial Services Allowed after April 20

#IndiaFightsCorona



Print & electronic media; IT Services with upto 50% strength



Data & call centres for Govt activities, CSCs at Panchayat level



E-commerce companies, courier services, cold storage & warehousing



Private security & facilities management services; hotels, homestays, etc.



Establishments for quarantine facilities; self-employed services like electrician, plumbers etc.



LOCKDOWN 2.0

Guidelines for Public Spaces

#IndiaFightsCorona



Wearing face cover & practice of social distancing compulsory



Gathering of over 5 persons in public places prohibited



Marriages & funerals to be regulated by DMs



Spitting in public spaces is punishable with fine



Strict ban on sale of liquor, gutka, tobacco, etc.



LOCKDOWN 2.0

Industrial Establishments Allowed after April 20

#IndiaFightsCorona



Industries in rural areas, SEZs & Export Oriented Units, industrial estates, industrial townships



Manufacturing units of essential goods, IT hardware; Food processing units; Jute industries



Coal and mineral production & O&G refinery; Brick kilns in rural areas



Construction activities including roads, irrigation projects, renewable energy projects; construction projects in municipalities

Lockdown 2.0 : Exempted Services



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LOCKDOWN 2.0

Health Services Allowed after April 20

#IndiaFightsCorona



Hospitals, nursing homes, telemedicine facilities, medical shops & dispensaries



Medical research, COVID-19 related labs & collection centres; authorised private establishments



Veterinary hospitals, dispensaries, clinics, sale & supply of vaccines, medicines



Manufacturing units, medical devices & Construction of health infrastructure



Movement of all medical personnel, scientists, nurses, para-medical staff, lab technicians



मेरी सरकार

LOCKDOWN 2.0

Guidelines for Hotspots

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COVID-19 Hotspots, or clusters to be determined as per guidelines by Health Ministry



In hotspots, containment zones to be demarcated by States/ UTs/ District administrations



In these containment zones, exemption given from April 20 will not be applicable



Strict perimeter control to ensure no unchecked inward/ outward movement except for essential services



मेरी सरकार

LOCKDOWN 2.0

Know What Will Remains Closed

#IndiaFightsCorona



Domestic & International Air travel; passenger trains, Buses, Metro, Taxis, inter-state transport except for security & medical purposes



Industrial & commercial activities, Hospitality services, educational, training, coaching institutions etc



Cinema halls, malls, GYMs, Bars, pools, entertainment parks, assembly halls etc



All social, political, entertainment, sports complexes, religious places & other gatherings



मेरी सरकार

LOCKDOWN 2.0

Guidelines for Work Spaces

#IndiaFightsCorona



Adequate arrangements for temperature screening & sanitizers; ensure social distancing norms



Gap of one hour between shifts; encourage use of Aarogya Setu App



Persons above 65 years & parents of children below 5 yrs encouraged to work from home



All organizations to sanitize their workplaces between shifts; large meetings prohibited

Arogya Setu App

The Government of India has launched Arogya Setu App in 11 languages to Fight the Covid 19. All the farmers and growers are requested to download the app from Google play store.

For Android : <https://play.google.com/store/apps/details?id=nic.goi.aarogyasetu>

For Apple iOS : <https://apps.apple.com/in/app/aarogyasetu/id1505825357>

The App connects the people with Health services with precision tracking. And self assessment.

Introducing



Aarogya Setu

मैं सुरक्षित | हम सुरक्षित | भारत सुरक्षित

An App that connects the people of India with health services, in our combined fight against COVID-19.



Why Aarogya Setu?



Protect yourself & the community from COVID-19



Precision tracking of the spread of COVID-19



Access curated and relevant advisory



Self-assessment test for infection mitigation



Help and support at hand

Protect One | Protect All | Protect India

Kisan Rath App

In order to address the difficulties in transportation of agricultural produce the Government of India has launched Kisan Rath App in 8 languages.

ISAN RATH Mobile App facilitates the farmers and traders across the country for transportation of agri-produce by connecting them with the transporters. The app interfaces with leading transport aggregators and individual transporters for providing a wide range of transport vehicles at required date and place, in a quick and easy way. The App can be downloaded from Google play store at the following address..

play.google.com/store/apps/details?id=com.velocis.app.kishan.vahan&hl=en_IN



Ministry of Agriculture and Farmers' Welfare introduces the Kisan Rath Mobile Application

The Ministry of Agriculture and Farmers' Welfare has launched a 'Kisan Rath' Mobile App to expedite the transportation of food grains. This will help Farmers' FPOs and Cooperatives across India to locate an appropriate transport facility to relay their agricultural products to the market.

Source: fresherslive.com | Apr 18, 2020

DRY FLOWER TECHNOLOGY

The surplus produce of Floriculture farms can be turned into value-added products to supplement the household income through the technique of dehydration / drying. The major advantages of such dry flowers are...



Cheaper, economical and long lasting

Range of products - eco-friendly and bio-degradable

Year round availability even in winter and off season

Survive hot summer and cold winter

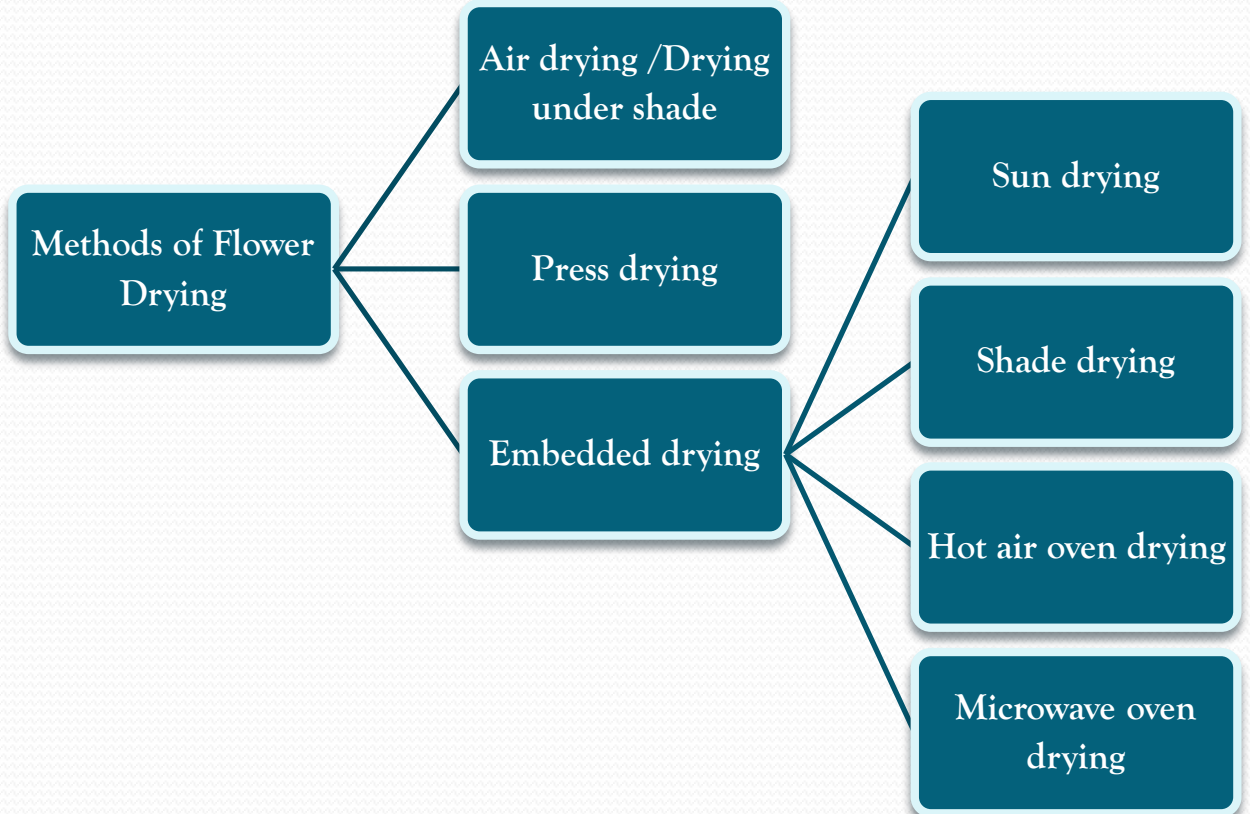
Not easily perishable, minimum upkeep and maintenance

Minimizes the handling losses

Offers wide range of suitable and striking colors

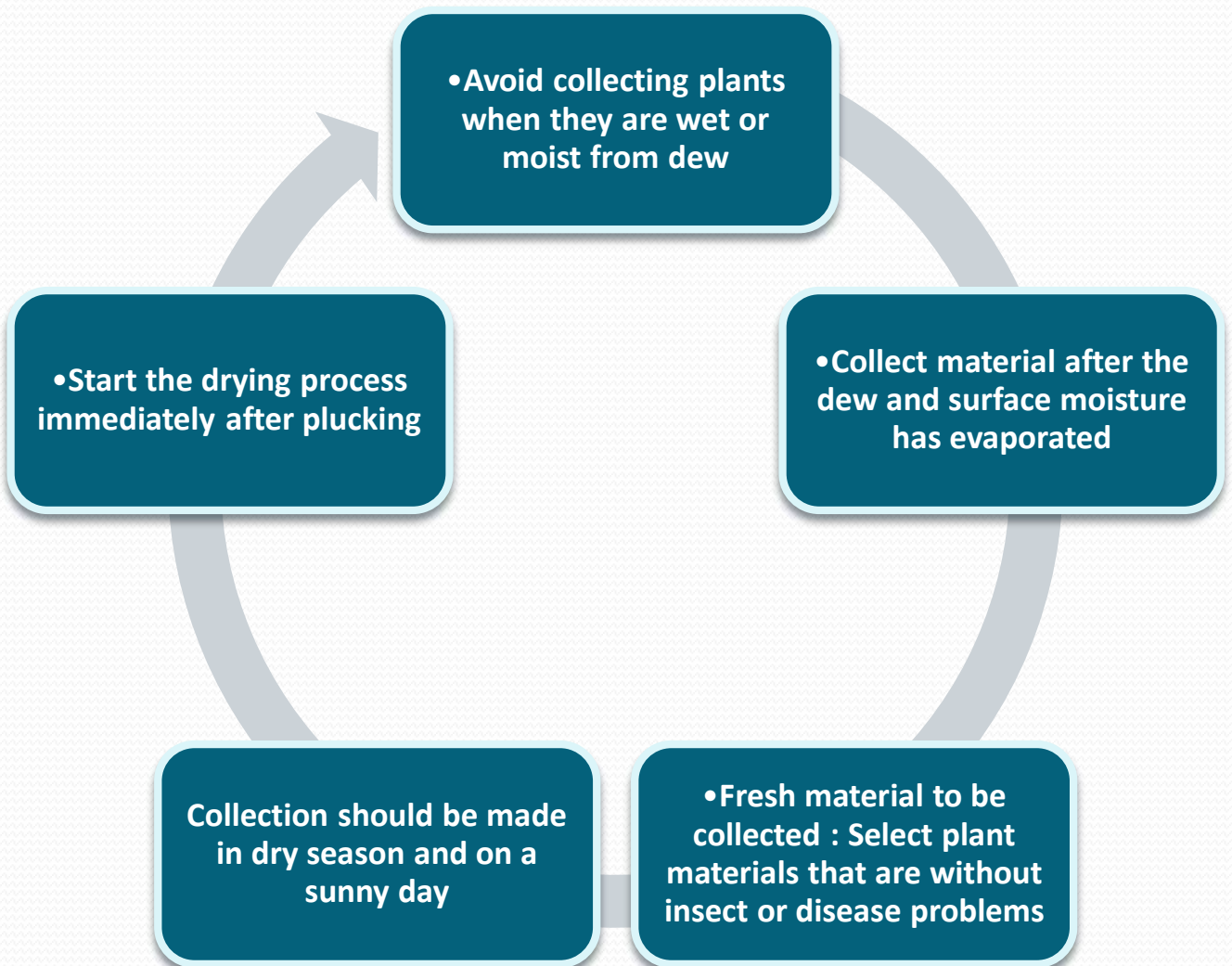
Drying Methods

The flowers can be dried by different means, which are summarised here under



Collection of Raw Material

Follow the following steps to collect the raw material required.



Air Drying

Follow the simple steps to dry the flowers by air drying

Cut flowers of good quality at prime conditions or slightly immature.

Remove foliage from stems.

If stems are weak or become brittle after drying, remove them and wire the flowers.

Group the stems into small bunches and tie with a rubber band. It will pull tighter as stems shrink during drying.

Hang in an inverted position in a well ventilated, warm and shaded place.

Good air circulation is important.

Allow to remain until thoroughly dried. This normally takes 2-3 weeks.

Air Drying

Flowers are hung in inverted position and dried in shade



Suitable Flowers

Some of the flowers suitable as dry flowers are

Helichrysum

China Aster

Golden rod

Baby's breath /Gypsophila

Celosia

Globe amaranth/ Bachelor's button

Hydrangeas

Grasses

Marigold

Rose

Salvia

Bells of Ireland

Calendula

Callistemon

Dahlia

Zinnia

Gerbera

Carnations

Press Drying

The press for press drying can be easily fabricated by using two equal sized ply sheets with screws as depicted in the picture

Flowers and Foliage are placed in-between two folds of newspaper (or blotting paper)

These sheets are kept one over other

Place corrugated boards of the same size in between the folded sheets to allow the water vapour to escape.

The whole bundle is then placed in the plant press, Then tighten the screws

After 24 hours the bundle is placed in an electric hot air oven for 24 hours at 40- 45°C.



Drying between sheets



Screw press

Press Drying

Some of the flowers, foliage and ferns suitable for press drying are summarised



Flowers

Pansy

Ixora

Mussaenda

Candytuft

Chrysanthemum

Euphorbia

Lantana



Foliage

Thuja

Marigold

Cassia biflora

Casuarina

Grevillea robusta

Rose foliage

Calliandra spp



Ferns

Adiantum

Nephrolepis

Golden fern

Silver fern

Barnsley

Maidenhair fern

Boston fern

Drying by Embedding

The plant materials are kept in plastic/ aluminium/tin containers



Desiccants are carefully poured on top of them without affecting the original shape of the flowers and shape.



Drying in Sun

Embed in drying medium in a container and expose to the sun daily for rapid dehydration.

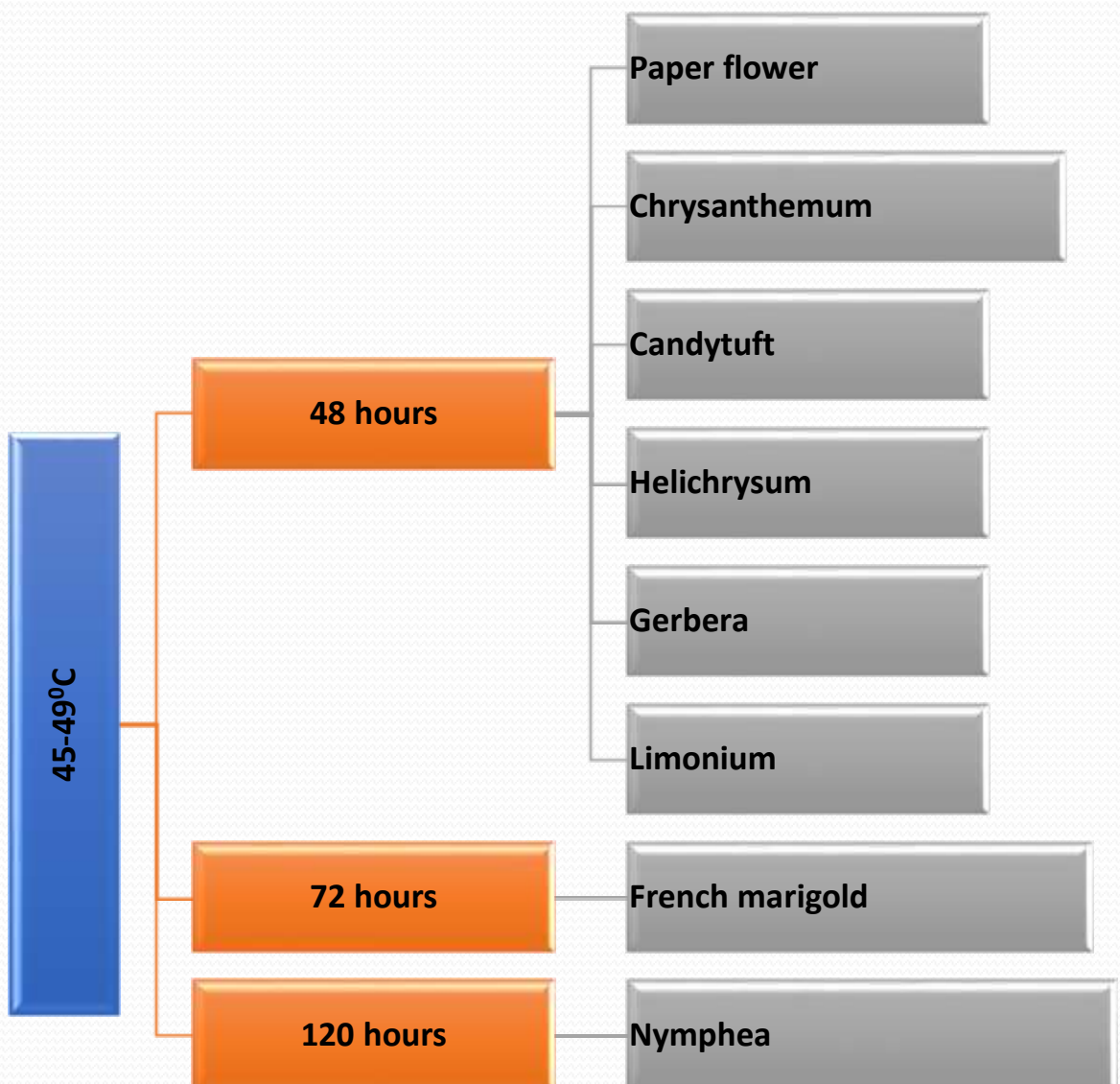
Embedded in sand in an upside down fashion and kept in the sun would dry in a day or two.

Media for Embedding

- Silica gel
- Quartz sand
- Sand
- Saw dust
- Perlite
- Borax

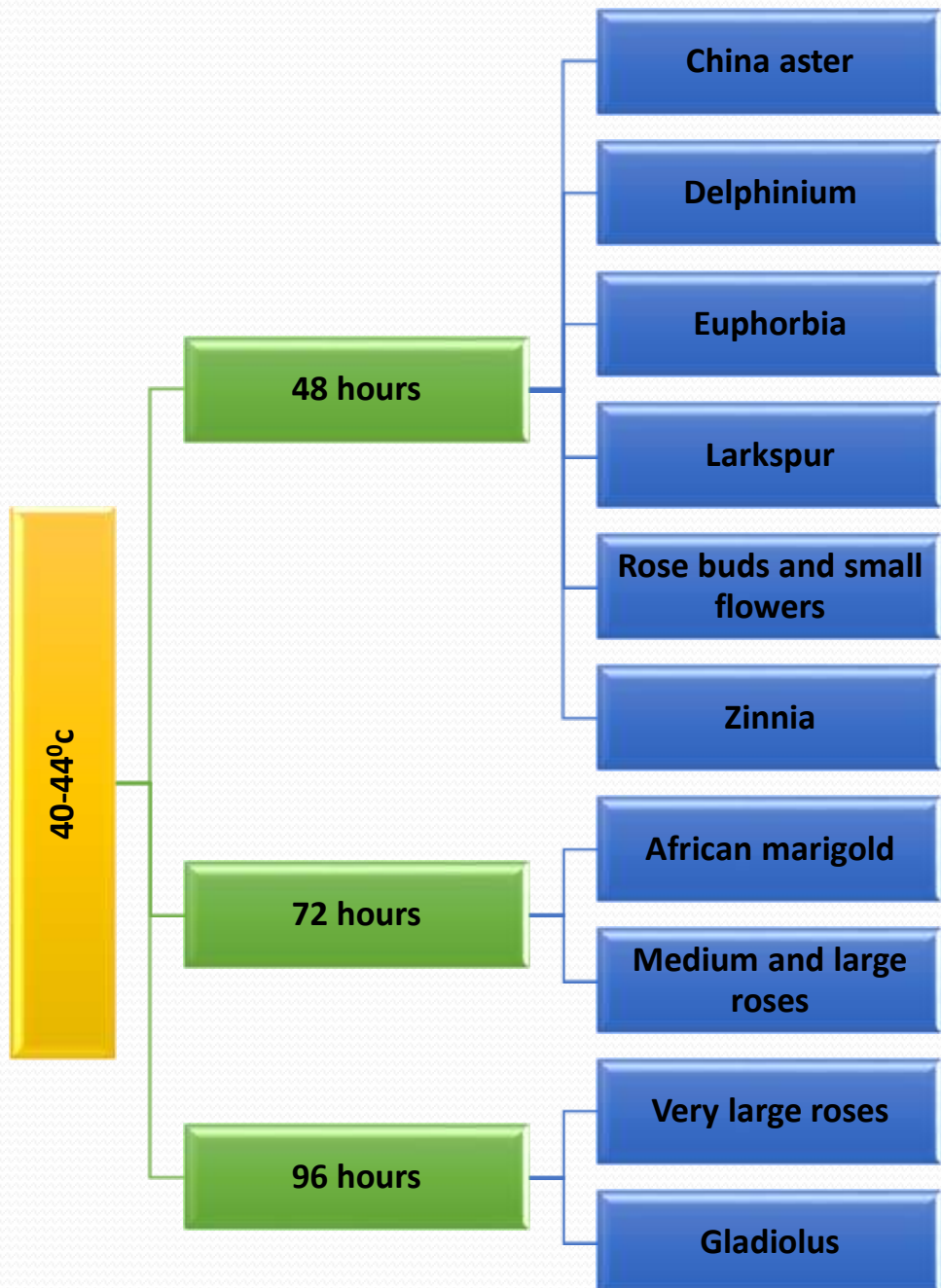
Hot Air Owen Drying

Hot air oven at a controlled temperature of 40-50° c is used for drying flowers in an embedded condition. The ideal temperature and the duration of exposure for different flowers are summarised hereunder.



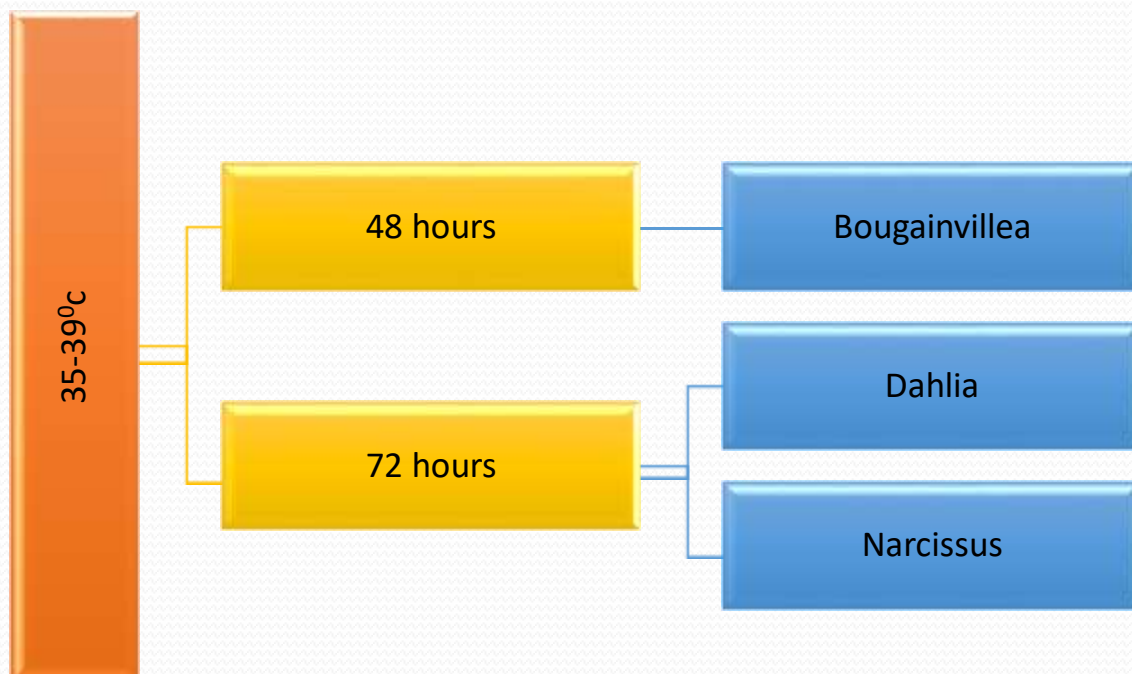
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Hot Air Oven Drying

Hot air oven at a controlled temperature of 40-50° c is used for drying flowers in an embedded condition. The ideal temperature and the duration of exposure for different flowers are summarised hereunder.



Microwave Drying

Microwave drying is one of the fastest modes of drying flowers. The flowers dried in a microwave Oven tend to retain their shape and natural colours as the exposure time is very short. However, the time and temperature need to be standardised other wise the flowers get totally discoloured.

Electronically produced microwaves liberate moisture from organic substances by agitating the water molecule.

It is fast and the results are good.

The flower has to be embedded in silica gel medium in a microwave safe open container along with a small cup with water nearby.

Standing time of 10 minutes to few hours is needed after the drying for best results.

A temperature of about 70°C (silica gel) is ideal .

Petals of roses especially from fragrant varieties/species like *Rosa bourboriana* can be Converted to rose gulkand and rose sherbat. The detailed procedure on how to make Gulkhand is summarised.

How To Make *Gulkand*

Fully open fresh flowers from fragrant varieties are harvested
In morning between 5.00-7.00 AM

Flowers are spread on sterilized clean floor for 12 hrs, to reduce the
moisture for easy petals separation,

Remove the rotten petals, anthers and pedicel with the help of fast
speed blower. Petals are washed and slightly dried

Petals (1.0 Kg) and sugar / sugar candy (1.250 - 2.0 Kg) are mixed by light
pressure with wooden hammer in steel pot or galvanized steel box.

Keep the mixture in sun light at least for six hours / day for impregnation
of sugars continue up to 30-45 days in May-June.

Stir the mixture with sterilized wooden spatula for uniform composition

After 30-45 days the *gulkand* is ready for consumption

After that add various ingredients like silver foil, cardamom seeds

Pack in clean glass jars or sealed in silver lined plastic bags- 0.5 to 1.0 kg

Store in clean and cool place for transportation and marketing

Advisory for Andaman and Nicobar Islands **ICAR-Central Island Agriculture Research Institute, Port Blair**

General Advisory

- In the dry season, the problem of sucking pests (whitefly and mealy bug) may be controlled by frequent water spray to disturb the colony. Neem oil spray (3ml/liter) may also control the sucking pests as there is no option for insecticides in the Island

Marigold

- Nursery raising of marigold cuttings in plug tray or small polybags for planting after onset of rains.
- If there is no market for flower sale, the flowers may be harvested and petals dried for use as additive in poultry feed.

Tuberose

- The plant may be headed back leaving 10 cm height from the ground level. This may help in delayed flowering with good flower yield after 45 -60 days. When three year old crop is headed back, bulb and bulblets development may be vigorous which may be utilized for next year planting

Jasmine

- Partial removal of leaves for flower regulation to delay flowering and increased yield for the next flowering season.
- Earthing up and dry crop residue mulching will conserve moisture during this dry season. If irrigation facility is available, fortnight irrigation may be done only to wet the root zone.

Crossandra

- Because of the existing dry spell, irrigation is a problem. Hence it is advisable to avoid weeding in the crossandra plots to conserve moisture and prevent evapotranspiration. The weeds may serve the purpose of live mulch.

Advisory for Arunachal Pradesh

ICAR- Central Agricultural University, Pasighat

General Advisory

- The farm implements used should be disinfected before and after use.
- Farmers are advised to wash their hands with soap at regular intervals.
- Advised to keep a social distance of at least 1 metre in or out of the farm.
- Farmers are advised to use protective mask.
- Proper sanitation is essential if the implements are being shared.
- Farm related activities viz. sowing, planting, harvesting, etc. should be taken up by maintaining social distancing by workers.
- Field preparations can be carried out during this period which will help in exposing the soil for solarisation.

Crop Advisory

- Seed collection of the winter seasonal annuals can be done followed by other activities like cleaning, processing later once the situation improves.
- Pro-trays can be used for sowing of seeds and taken care at home.
- Irrigation, weeding, fertilizer application should be continued keeping in mind the distance if 4-5 workers are present.
- Dried flowers should also be removed as it may be a breeding ground for pests and diseases.



New tuberose hybrids at ICAR-DFR, Pune

Advisory for Assam

Assam Agricultural University, Kahikuchi, Assam

General Advisory

During the present circumstances the farmers have to confine themselves to certain crucial farm operations only in regards of tuberose, gladiolus, gerberas, marigold, and seasonal flowers, crops and planting material that are grown under protected conditions. Farmers are advised to follow the guidelines already circulated by the Central Government as well as the State Government to contain the Covid-19 disease.

The farm labours should sanitize their hand before and after the work. They should also use *Gamucha* for covering whole face and planting operation should be performed in such a way so that they never come closer to each other.

Tuberose

- As mid-March to April is the optimum time for planting of tuberose in this region they should go for land preparation and planting of bulbs following certain protocol.
- Can use their own tractor, power tiller or bullocks for soil preparation
- If hiring tractors and power tillers for operation, maintain a physical distance with the operator at the time of operation. Cover whole body with clothes and use mask.

Gladiolus

- In gladiolus this is the time for lifting of corms. Here also farmers should follow social distance during lifting and curing.
- Engage only family workers for lifting and curing if the land holding is smaller.
- Keep the corms in open shady area during April and May then shift to the cold storage after proper bagging and labelling.

Gerbera

- In gerbera this is very crucial to maintain the field moisture level as the crop is very much sensitive to water stress during the summer season.
- Irrigate the crop maintaining a field saturation level by engaging own family members (of the grower) or labours following all precautions for the operation of sanitization and social distancing.
- Remove the withered flower stalks and keep contact with the retailers at *Mandi* so that as and when necessary flower should be sent to specific location. If necessary helps required from Administration for movement of travel, take the help and advice of ADO and Local police to get a movement pass.
- Reduce the fertilizer to half just to maintain the crop.

Marigold

- This is the peak hour for marigold growers for harvesting the flowers. As the situation prevents the farmers to send the flowers to the flower market they can adopt certain alternate means to save the flowers.
- Harvest the flowers and dry the petals for marigold tea and poultry feed. For harvesting flowers engaged as much as family members only or by labours following all precautions of sanitization and social distancing.
- Keep the field moist by irrigation at weekly interval.

Seasonal Flowers

- In seasonal flowers it is high time for the farmers to collect dry seeds before receiving first shower of rainfall.
- For seed harvesting, curing, cleaning and storing of dry seeds of seasonal flowers engage family members only or by labours following all precautions of sanitization and social distancing.

Crops grown under protection

Generally anthurium, gerbera and orchids are grown under protection in a maximum crop area of 500 m² in this region. Hence maintenance of the crops under present circumstances should be confined to their own family members only. Farmers are advised to keep contact with their regular retail seller so that they can dispose the flower stalks as and when the demand arises.

Nursery

- The nurserymen are advised to restrict arrival of new planting materials.
- Keep only few casual workers to perform daily nursery activities like watering.
- Maintain physical distance while working
- Follow all the guidelines given by government to contain the spread of the virus.

Advisory for Bihar

Dr. Rajendra Prasad Central Agricultural University, Samastipur

Tuberose

- Those who have planted the crops in the month of March and germinated should maintain it.
- Irrigation, weeding and fertilizers application should be done as when required and that too with minimum amount.
- If not planted, it can be deferred till June - July.

Marigold

- Farmers may go for harvesting/collecting seeds for self use in the next season.
- For the summer season crop farmers have planted the marigold in the month of February-March.
- Weeding, irrigation and fertilizers applied to be done as per requirement.
- Pinching and disbudding shall be done 30-40 days after planting.

Gladiolus

- Flower harvesting is over now.
- If the foliage become dry, then corms should be harvested.
- Lifting of harvested bulbs should be done by maintaining social distance.
- Treat the corms with carbendazim and store in cold storage for next season planting.



On farm Training on Tuberose at ICAR-DFR, Pune

Advisory for Chhattisgarh Indira Gandhi Krishi Vishwavidyalaya, Raipur,

Tuberose

- Once the Covid situation subsides, start preparing the land by deep ploughing and expose the soil for soil solarisation.
- For standing crops, life saving irrigation and weeding should be taken up.
- Dried/withered spikes need to be removed.

Jasmine

- This is the flowering season for Jasmine (especially for *J. sambac* and *J. grandiflorum*). Provide adequate irrigation and recommended nutrition dose.
- Care should be taken for the control of insect pests/diseases, as and when required.

Gladiolus

- Lifting of corms their treatment and storage needs to be taken care upon the improvement of labour availability. Till such time the corms can remain in the soil.

Chrysanthemum

- In the standing crop (mother block) pruning the dried & unwanted shoots, top-dressing with nitrogenous fertilizers, life saving irrigation and weed control are to be taken up.
- Cut back all the branches and irrigate to encourage the sucker production. Top cuttings can be taken from the suckers after one month.

Rose

- Summer showers may result in fungal incidence, hence prophylactic spray of fungicides (carbendazim) may be undertaken. Hot and dry climate is favourable for the incidence of spider mites. Application of miticide (Abemectin 1.9EC) would control the mites. Regular irrigation would increase the relative humidity and reduce the multiplication of mites.
- Intact flowers on the plants may become the site of fungal attack, hence, dried/withered flowers may be removed from the plants.

China Aster and Marigold

- In most places the flower production might have been completed as the season is over. However, in those areas where harvesting is not yet done, farmers may go for collecting the seed for self use in the next season and also for distribution to others.

Annuals

- Seed collection, processing and storage are important activities for winter annuals.
- Allow the flowers to completely dry and collect the flowers/seeds.
- Cleaning, processing of the seed could be taken up following social distance.



On farm training during exposure visit at ICAR-DFR, Pune

Advisory for Delhi and Northern Plains
ICAR-Indian Agricultural Research Institute, New Delhi

Rose

- Do not harvest flowers from the greenhouse and adopt bending to have robust plant growth and to regulate the crop for need based flowering in next flush.
- Foliar spray of 0.02 percent Bavistin or suitable other fungicide to prevent Powdery Mildew fungal disease.
- Remove the suckers of newly budded and propagated plants.
- Regular Irrigation in nursery plants and rose garden.

Chrysanthemum

- Irrigate the mother plants block as and when required.
- If not done yet, head back the previous season growth and apply nitrogenous fertilizer to promote branching in mother plants.
- Suckers can be planted in separate beds varieties wise.

Lilium

- Remove all flowering shoots at 15-20 cm height to promote bulbs and bulblets development and let the ratoon crop flourish after a gap of 2-3 months in the net house.
- In case, crop is grown in open field then bulbs can be harvested for storage under low temperature of 2°C or re-transplant at hills after 45 days of harvesting with pre-treatment with GA₃ or garlic paste or thio-urea @0.2%.

Gladiolus

- The crop is in maturity stage particularly in north India. Bulbs can be harvested or digging of corms may be delayed for 10-15 days in case of labour problem but crop needs to be irrigated once in that situation.
- Mechanical digger can also be used. Proper tagging indicating variety, date of harvesting and details needs to be mentioned for further sorting in due course of time before the material is dispatched for cold storage.

Tuberose

- Digging of bulbs and replanting can be delayed. The standing crops may be continued as the ratoon crop with regular irrigation and inter cultural operations.

In case of fresh planting, bulbs should be treated with fungicide such as Bavistin (0.1%) before planting.

Marigold

- Marigold is grown almost throughout the year in most of the parts of the country. Therefore, some (old) fields are in flowering. The standing crop could be allowed for seed production with careful rouging to remove the off types. For summer marigold staggered transplanting can be made suitably under irrigated field.

Ornamental Plants (indoor and outdoor)

- Irrigate the potted plants as and when required.
- Ensure partial shade for indoor plants.
- Hedge, shrubs and trees should be flooded with water once in a week at least for their survival.

Seasonal Flowers

- The Rabi season flower seed is nearer to maturity and same can be harvested in separate bags even the whole plants with proper tags indicating crop variety, date, colour and lot for further processing and sorting.

General Advisory

- At this time farm labourers are advised not to work in groups but they should work in isolation to maintain social distancing during harvesting of flowers, transplanting, irrigation and other cultural operations.
- They are also advised to use mask during these operations and frequently hand wash with soap/detergent.
- Apart from the social distancing, personal hygiene is equally important.

Advisory for Gujarat
Navsari Agricultural University, Navsari,

Country Rose

- Regular irrigation should be applied to maintain sufficient soil moisture as the temperature is increasing gradually day by day.
- In hot and dry climatic condition, thrips and mites infestation may occurred. To control thrips and mites effectively, spray Thiomethoxam 25 wg (3 g/ 10 ltr.) and Propergite 57 % EC (10 ml/ 10 ltr.), respectively.
- Un-harvested flowers (dried/withered flowers) on the plants should be removed to minimize the incidence of fungus and insects.
- Instead of throwing away flowers, farmers are advised to use flowers for preparation of value added products like *Rose pankhudi* (dry petals), *ghulkand*, rose syrup in lockdown situation.
- Pruning in country rose (*Rosa chinensis*) is also recommended to maintain vegetative growth in first week of May and paste copper oxychloride immediately after pruning on pruned branches.

Marigold

- Prepare the land by deep ploughing and expose the soil for solarisation for transplanting of marigold seedlings in July month.

Spider lily

- Farmers are advised to apply life saving irrigation to maintain sufficient soil moisture.
- According to present situation, market is not available so flowers should not be harvested to reduce the cost of cultivation.
- In the upcoming month (May), farmers are advised to cut the leaves in 1st week of May and subsequently apply 13-00-45 (NPK) @ 1.5 % (15 g/ltr) through foliar application as first spray when plants attain 30-45 cm leaves after defoliating followed by second spray after 15 days of first application along with RDF (300:225:200 kg NPK/ha/year) for getting more flowers in August and September months (festival time).

Chrysanthemum

- Perennial chrysanthemums in open field have completed flowering so in the standing crop (mother block), cut back all the branches up to 7 cm from ground and irrigate to encourage the sucker production.

- Top-dressing with nitrogenous fertilizers, life saving irrigation and weed control are to be taken up after cut back plants. Top cuttings can be taken from the suckers after one month of cut back.
- If any fungal or insect infestation is seen than spray fungicide or insecticide accordingly for producing healthy suckers.

Gladiolus

- **Lifting of corms and cormels:** Flowers are already harvested in January – February months so now time to lift of corms and cormels. After almost drying of leaves, uplift gladiolus corms and cormels and dry under shade after separating, cleaning for one week. Thereafter, treat the corms and cormels with 0.2 *per cent* carbendazim fungicide for 15 minutes and dry in shady condition again up to one week and fill in ventilated plastic bags (onion bags).
- **Storage of corms and cormels:** After packing, store corms and cormels at 5-7°C in cold storage up to September.

Tuberose

- March to June is appropriate time of planting of tuberose bulbs. Start preparation of the land by deep ploughing and expose the soil for solarisation.
- For standing crop, life saving irrigation and weeding should be done. Dried/withered spikes should be removed from plants.

Jasmine

- Provide adequate irrigation and recommended nutrition to *mogra*
- Bud borer infestation in some of the areas could be managed by spraying contact insecticide.
- Oil extraction and *agarbatti* can be prepared during lockdown time.

Annual flowers

- Good size gaillardia, annual chrysanthemum flowers, etc should be selected and allow to dry for seed production.

General Advisory

- Preparation of dry flowers from colourful flowers like rose, marigold, chrysanthemum, China aster, etc is better than discarding the flowers. The dried petals could be used to make eco-friendly *gula* for later use and marigold dry petals may also be used as poultry feed.

Advisory for Himachal Pradesh

Dr.Y.S.Parmar University of Horticulture and Forestry, Solan

The farmers of the state are growing various ornamental crops like; chrysanthemum, marigold, gladiolus, carnation, rose, gerbera, liliium, daffodils, tulips and alstroemeria etc. However, in view of the Covid 19 pandemic, many of the flower growers are throwing their flower produce due to complete lockdown in the country. Invariably, farmers are making phone calls to the scientists of the department of Floriculture and Landscape Architecture of Dr. YS Parmar University of Horticulture and Forestry to discuss their problems and further suggestions. The 'Advisory Team', consisting of different scientists of the department, under the chairmanship of Dr. Rajesh Bhalla, is giving different suggestions depending upon the crop under cultivation and area of the farmer to which he/she belong. These suggestions include:

Crop Advisory

- Carnation growers can reduce fertigation, repeated pinching, and go for staggered planting.
- Gerbera growers can also reduce fertigation.
- Liliium, tulip and daffodil growers can go for bulb multiplication by disbudding the emerging flower buds.
- Marigold and Chrysanthemum growers can keep their fields ready for the forthcoming season. Simultaneously, they can go for multiplication of the planting material of commercial cultivars of carnation and chrysanthemum.
- Rose growers can go for drying of petals which can later be used for preparation of *rangolies* and *aggarbatis*.



On farm training on Chrysanthemum, ICAR-DFR, Pune

Advisory for Jammu & Kashmir
Sher-e- Kashmir University of Agricultural Sciences and Technology,
Srinagar

Growers/entrepreneurs are advised to go for farm operation as per the Lockdown and social distancing advisories issued by the Government of UT of J&K from time to time. In view of the COVID-19 Lockdown following advisory is issued for the flower growers and landscape nursery owners of Kashmir valley.

Tulips and Daffodils

- De-head/ remove flowers of Tulips and daffodils and dispose off the same safely.
- Remove the off- types to maintain the purity of the cultivar.
- Top dressing with Calcium nitrate @ 12 kg per 500 sq. meter after flowering is over.

Gladiolus and liliium

- Gladiolus and liliium can be planted up to end of the May and hence defer planting of gladiolus and liliium after the easing of Lockdown restriction.
- Meanwhile inspect the bulbs and corms in storage for any signs of disease.

Gerbera and carnation

- Remove gerbera and carnation flowers and dispose off safely away from greenhouses.
- Maintain minimum required irrigation/pest control measures for survival of the crop.
- Remove side-curtains of green/poly houses to reduce high temperature shock.

Seed production (Winter annuals)

- Annual flower seed producers and Landscape nursery owners are advised only to maintain minimum required irrigation for survival of crop plots and landscape nursery.

Advisory for Kerala
Kerala Agricultural University, Vellanikkara, Kerala

Anthurium

- Farmers who are growing anthuriums should ensure sufficient irrigation to the crop during these hot summer months.
- Additional shade may be provided in south west directions of the green house to avoid the adverse effect of high solar radiation.
- Foliar application of nutrients should be continued as per the schedule. Young plants may be sprayed with a fertilizer mixture containing higher ratio of nitrogen (3:1:1) @ 2g/l, twice in a week.
- For flowering plants apply of 1:2:2 NPK mixture 2-3g/l twice in week.
- Remove the spent flowers as well as old leaves to keep the plants healthy.
- Timely plant protection measures should be under taken as and when needed.

Cut foliage

- Since the domestic demand is nil during the lock down period and no export is possible due to international scenario in the context of "Covid 19," farmers who are having *Dracaena fragrans* 'Massangeana' cultivation are advised to continue with the minimum maintenance practices like irrigation and interculture.
- Foliar spray of nutrients can be avoided to reduce the growth rate of plants. Those who are having facility to propagate the planting material can continue the practice so that more planting materials can be produced for the coming planting season.
- The field should be kept free of weeds to prevent grass hopper attack.
- Before the onset of South West monsoon i.e. during the end of May, a foliar application of a systemic fungicide (Bavistin 0.1% or Saaf 0.2%) will prevent the die back during heavy rains.
- Farmers who would like to expand the cultivation and also the new farmers who would like to start the cultivation of the crop can start the preliminary land preparation works like land clearing, ploughing etc. observing the guidelines of Covid 19

Orchids

- Ensure irrigation to plants. Additional shade may be provided in south west direction of the green house to avoid the adverse effect of high solar radiation.
- Young plants may be sprayed with a fertilizer mixture containing higher ratio of nitrogen (3:1:1) @ 2g/l, twice in a week. For flowering plants apply of 1:2:2 NPK mixture 2-3g/l twice in week.
- Spent flowers should be removed to keep the plants healthy.
- Cuttings with at least two roots can be prepared from over grown monopodials to continue planting material production.
- Follow timely plant protection measures to keep the pests and diseases under control.

Advisory for Maharashtra **Mahatma Phule Krishi Vidyapeeth, Pune**

General Advisory

Apply the nutrition through drip irrigation.
Always use tractor operated mechanical sprayers (if available) with due care for the person handling the spray system.
Remove the flower buds and do not allow it to develop into flowers as there is problem of transport and marketing.
Use proper sanitation measures and social distancing while performing the operations.

Crop wise advisory

Rose

Remove the unwanted sprouts/ growth on rootstock, dried and diseased leaves.
To control the powdery mildew, spray Difenconazole 0.05% at an interval of 8 days with mechanical spray.
To control white fly, spray Imidacloprid 0.5 ml or Acetamiprid 0.4 ml or Abamectin 0.4 ml per liter of water with mechanical spray.
To control red mites, spray Dicofol 1.5 ml or Abamectin 0.4 ml per liter of water.

Gerbera

Reduce the fertilizer dose to half and irrigate the crop for maintenance.
Remove the buds regularly to avoid taking flowering due to low demand.
To control root rot and stem rot, drenching of Captan 0.3% or Benomyl 0.2% at 15 days interval.
To control alternaria, spray 0.1% Benomyl at the interval of 8 days.
To control thrips, spray Imadicloprid 0.5 ml or Acetamiprid 0.4 ml or Abamyctin 0.4 ml per liter of water.

Carnation

At the time of plantation, dip the roots in the solution of 0.2% Benomyl
Drenching of beds with 0.2% Benomyl or 0.3% Captan + 0.1% Malathion
To control red mites, spray Dicofol 1.5 ml or Abamectin 0.4 ml per liter of water

Tuberose

- Land preparation should be done through tractor operated machinery with due care for the person handling the machine.
 - Planting time: April- May
 - Planting Method: Raised beds (90 cm width, 45 cm height)/ Ridges and furrows
 - Planting distance: 30 x 30 cm
 - Varieties: Phule Rajani, Phule Rajat, Arka Prajwal, Suhasini, Vaibhav
 - Bulb treatment: Weight of bulb should be 30 gm, treated with 0.3% Captaf for 20 minutes
 - Fertilizers: 40-50 tones FYM/ ha, 200:150:200 kg N,P,K / ha, this should be distributed in three equal installments
- I. At the time of plantation
 - II. 45 days after plantation
 - III. 90 days after plantation
- At present if crop is under rest, dig up the bulbs and cure them for 15 days in shade

Gladiolus

- Dig up the corms and treat them with 0.3% Captan. Dry them in shade before keeping them in cold storage.
- For storage rot, dip the corms in Captan 0.3%, dry it in shade and fill in the bags with proper labels and store it in cold storage.



On Farm training on Marigold at ICAR-DFR, Pune

Advisory for Meghalaya **ICAR-Regional Complex for North Eastern Hilly Region, Umiam**

Flowers are very perishable commodities and it is year round activities which are time bound including planting, crop management, harvesting, value addition and marketing are inevitable. Therefore, farmers are advised to follow precautions and safety measures in order to prevent the spread of the disease as well as maintain the existing crop.

General Advisory

General measures include social distancing, maintaining personal hygiene by washing of hands with soap, wearing of face mask, protective clothing and cleaning of implements and machinery. Farmers/ operators are advised to follow safety measures and social distancing at each and every step in the entire process of field operations.

- Measures of personal hygiene and social distancing to be followed by those engaged in harvesting of all flower crops before, during and after executing the field operation.
- In case of manual field operations of harvesting/ picking, accomplish the operation in 4-5 feet spaced strips assigning one bun/ strip/ patch/ plot to one person. This will ensure adequate spacing between the engaged labours.
- All the persons engaged should use masks and ensure hand washing with soap at reasonable intervals.
- Maintain safe distance of 3-4 feet during rest, lunch time, transfer of produce at collection point, value addition unit, loading/unloading.
- Stagger the field operations wherever possible and avoid engaging more number of persons on the same day.
- Engage only familiar persons to the extent possible and after reasonable enquiry as to avoid the entry of any suspect or likely carrier during field activity.
- Prefer mechanized operations over the manual wherever feasible. Only the essential numbers of persons should be allowed to accompany the machine.
- All machines should be sanitized at the entry point and at regular intervals. All transport vehicles, gunny bags or other packaging material should also be sanitized
- The collection of the produce may be done in small heaps spaced at 3-4 feet and field level processing or value addition should be assigned to 1-2 persons/ heap to avoid crowding.
- Proper sanitation and cleanliness of packing shed, containers and other materials used in value addition of flowers especially when materials are shared and used by farmer groups.

Flower Crops in Meghalaya

Gerbera, Orchids, Bulbous plants, Bird of paradise, Chrysanthemum, Gladiolus, Marigold, Carnations, etc

Harvesting of Cut Flowers

- Harvesting of cut flowers of gerbera, orchids and other crops is going on in Meghalaya. Precautions and safety measures of workers engaged in repair, maintenance, harvesting and value addition operation is to be ensured.

Post-harvest, storage and Marketing of farm produce

- While performing pre-cooling, cleaning, grading, sorting and packaging operations and drying in case of dried flowers at the farm level or packing shed, wearing of protective face mask may help against aerosols and dust particles to prevent respiratory difficulties.
- Storage of planting materials such as bulb, corms, etc should be done with adequate pre-cautions.
- Adequate personal safety measures to be taken for loading and transporting of flowers and while participating in sale at market yards/ auction platforms

Standing field crops

- Gerbera is at flowering stage and weather conditions during this period, there may be chances of occurrence of powdery mildew. Adequate pre-cautions to be taken while spraying of recommended fungicide by contract sprayers/ farmers
- Operations such as irrigation, nutrient sprays and crop protection adequate precautions in handling of inputs, mixing, delivery and washing of equipment is to be undertaken.



On farm training on roses at ICAR-DFR, Pune

Advisory for Northern Hills

ICAR-Indian Agricultural Research Institute, Regional Station, Katrain

General Advisory

- The guidelines of GoI are to be strictly followed in the state. Safety measures and social distancing to be followed in all agricultural operations.
- Wear personal protection equipment and mask and maintain proper social distancing (3-4 feet) in farm operations.
- Sanitize farm implements before use in operations.
- With the help of district authorities, farmers are advised to plan for direct marketing of produce which is ready to harvest or use cold storage structures available within the district to avoid distress sale.

Crop Advisory

- Farmers are advised to go for planting of gladiolus and liliun in hilly areas.
- Raise the planting materials of chrysanthemum, carnations etc. for sale and June planting.
- Wherever possible, use N fertilizers and irrigate the field to postpone the harvesting stage of crop to some extent.
- Farmers are advised to go for disbudding and pinching (in Liliun) that result in good bulb production and delay or regulate the flowering (in carnation).
- Farmers are advised to raise the nursery of summer season flowering annuals during 1st week of May.
- If possible go for flower drying using appropriate drying methods.
- Farmers are advised to start field preparation for transplanting of seasonal flowers.

Advisory for Odisha

Odisha University of Agriculture and Technology, Bhubaneswar

Presently, the farmers are facing problem in marketing of flowers due to outbreak of Covid-19 resulting in shut down of cities, towns, places of worship and ban on official and social functions. Hence, the flower growers are suggested to take up the following measures.

Rose

- Irrigate the crop judiciously.
- Reduce application of fertilizers to half.
- Remove the flower buds and keep the vegetative growth under control.
- Take necessary plant protection measures in consultation with experts.
- Explore the possibility of selling the flowers (after drying) to *Agarbati* industry.

Marigold

- Remove the flower buds as soon as they appear and try to keep the plants in vegetative stage.
- Don't apply fertilizers.
- Water the plants regularly, depending on the soil condition.
- Explore the possibility of selling the flowers to poultry feed manufactures.

Tuberose

- Remove the flower spikes as soon as they appear to encourage vegetative growth.
- Stop application of fertilizers.
- This being summer season, irrigate the crop judiciously.
- Take necessary plant protection measures in consultation with experts.

Advisory for Punjab and Haryana **Punjab Agricultural University, Ludhiana,**

Rose – Loose and cut

- Flower petals can be dried at this moment under sun for use at later stage. Rose sharbat and Rose water can also be prepared. Gulkand can also be prepared for direct consumption by mixing rose petals with white sugar.
- In cut roses, flower buds may be removed or pinched at early stage or as the case may be. It will help in creating better plant architecture build up for next flowering.

Marigold

- Jaffri and African marigold crop which is in flowering or at the later stage of its growth can be ploughed in the field so that the field may be prepared for next sowing.
- In summer marigold crop, remove the buds which appear on the plants immediately, it will delay the flowering. Repeat the bud removal process is necessary.

Gladiolus

- Harvesting operations will start after mid-April. Accordingly, the labour may be advised by allocating digging, separating, cleaning and packaging of corms for completing the operations by following proper social distance.

Chrysanthemum

- The cultural operation like irrigation, weeding in ratoon crop of chrysanthemum should be done for proper growth and multiplication of purpose.

Seed Production

- For seed harvesting, cleaning grading and packing of seasonal flowers the labour should be advised to work individually. Proper guidelines of social distancing and sanitization should be ensured.

Advisory for Rajasthan

Maharana Pratap University of Agriculture and Technology, Udaipur

The farmers of Rajasthan are advised to follow the instructions issued from time to time provided by Govt. of Rajasthan for safety from Covid-19 disease. The growers are also advised to maintain hygiene, social distancing, use sanitizer's and masks on face, regularly hand washing 4-5 time with soap or hand wash. They were advised to sanitize their home & surrounding areas and consume healthy diet.

Crop Advisory

1. The flowers growers which are growing loose flower crops like gaillardia, marigold and annual chrysanthemum are advised to take seed production from the crop, so that the fresh flower losses can be minimized.
2. It is advised to spray sanitizer solution in the nursery area.
3. The farmers which are growing rose like *Rosa bourboniana* (Pushkar, Ajmer and Chittorgarh and Udaipur district), *Rosa damscena* (Cheti rose) in Khamnor village (Haldighati, Udaipur) are advised to use their flowers in value added products like preparation of Rose Pankhudi (dry petals), Gulkahnd preparation, and rose water through distillation process at their home during lockdown situation.
4. It is also advised that the waste product of rose distillation may be utilized for composting manure and may be used in *Agarbatti* making.
5. The farmers are advised to prepare rose nursery by multiply the plants.
6. The flower growers and nurserymen are advised to maintain their plant material and crop with timely irrigation, plant protection measures and other needed operations.
7. In case of difficulty the farmers are advised to contact us through phone call, video calling and Whatsapp massage.



Formers Ghosti at ICAR-DFR, Pune

For further details contact, AICRP-F, MPUAT, Udaipur

Advisory for Tamil Nadu **Tamil Nadu Agricultural University, Coimbatore**

Tamil Nadu has immense potential to produce world class cut flowers and loose flowers. It is the leading state in loose flower production in India. The diverse agro-climatic conditions prevailing in the state enable cultivation of a wide range of flower crops. The major flower crops cultivated in the state are jasmine, tuberose, chrysanthemum, rose and nerium.

The following strategies are recommended for the major flower crops to handle the current crisis caused by Corona virus (COVID-19).

Jasmine

Of India's jasmine production, 80% is contributed by Tamil Nadu. The state produces 1,36,901 tonnes of jasmynes annually from an area of 13,246 ha with a productivity of 11.21 t/ha (HortTech, 2018). Madurai, Erode, Dharmapuri, Tirunelveli, Thiruvallur and Thiruvannamalai are the major jasmine growing districts of Tamil Nadu. The jasmine flowers produced in Tamil Nadu are being exported to the neighboring countries *viz.*, Sri Lanka, Singapore, Malaysia and Middle East countries.

Strategies recommended for handling jasmine crop during COVID-19 crisis

- Light pruning of the plants by removing the growing tips (removal of 10-15 cm from the growing point) which will also serve as a disbudding to remove the flower buds and flowers.
- Nitrogen fertilizer application to induce vegetative growth (of the recommended NPK dosage, only N fertilizer may be applied) to induce only vegetative growth and discourage transition into flowering phase.
- Excess watering to induce only vegetative growth and discourage flowering.
- Rooting of the pruned cuttings to produce planting materials.
- Policy initiatives by the Central/State Government to permit transit of flowers by the farmers to the market.
- Facilitation for extracting concrete from flowers for which the jasmine extraction units need to buy flowers from farmers and pay them for the produce.

Tuberose

In Tamil Nadu, Dharmapuri, Krishnagiri, Tiruvannamalai, Salem, Namakkal, Trichy and Madurai are the leading districts involved in tuberose cultivation. The crop is cultivated in an area of 4979 ha with a production of 65,969 MT. There is high demand for tuberose concrete and absolute in the international market.

Flowers of the single type varieties are commonly used for extraction of essential oil, as loose flowers and for making garlands. Double type varieties are used as cut flower. Tuberose flowers all the year round, with a peak during August-September.

Strategies recommended for handling tuberose crop during COVID-19 crisis

- Nitrogen fertilizer application to induce vegetative growth (of the recommended NPK dosage, only N fertilizer may be applied) to induce only vegetative growth and discourage transition into flowering phase.
- Uprooting of bulbs of two year old crop and storing them for planting in the ensuing season.
- Policy initiatives by the Central/State Government to permit transit of flowers by the farmers to the market.
- Facilitation for extracting concrete from flowers for which the jasmine extraction units need to buy flowers from farmers and pay them for the produce.

Chrysanthemum

Chrysanthemum is cultivated in an area of 5,836 ha. in the districts of Dharmapuri, Salem, Krishnagiri, Dindigul, Tiruvannamalai and Erode. Chrysanthemum is highly photosensitive and is grown under open during the month of June to March. Cut Chrysanthemum varieties are grown round the year under polyhouse conditions. The harvesting seasons coincides with Sep-Oct for the main crop and Feb-Mar for the ratoon crop.

Strategies recommended for handling chrysanthemum crop during COVID-19 crisis

- The main crop can be headed back to the basal primary shoot so as to enable the ratoon growth.
- Since there is a great demand for planting materials, the shoots can be used as propagating materials.
- The suckers emerging out can also be used for multiplication of planting materials for the next season.

Nerium

Nerium cultivation is gaining importance in recent days owing to the diverse utility of the crop and its hardy nature which makes it adaptable to a wide range of growing conditions including poor soils and drought. Tamil Nadu leads India in commercial cultivation of nerium. Area under nerium cultivation is rapidly expanding in Salem, Dindigul and Madurai districts of Tamil Nadu.

Strategies recommended for handling nerium crop during COVID-19 crisis

- Light pruning by removing the growing tips (removal of 10-15 cm from the growing point) which will also serve as a disbudding action to remove the flower buds and flowers.
- Nitrogen fertilizer application to induce vegetative growth (of the recommended NPK dosage, only N fertilizer may be applied) to induce only vegetative growth and discourage transition into flowering phase.
- Excess watering to induce only vegetative growth and discourage flowering.
- Rooting of the pruned cuttings to produce planting materials.



Chrysanthemum Week 2019 at ICAR-DFR

Advisory for Telangana
Sri Konda Lakshman Telangana State Horticultural University,
Hyderabad

Jasmine

- Life saving irrigations should be given to protect the plants in hot summer.
- During hot and dry weather mite infestation will be severe and to control spray Dicofol 2 ml/l or Propergite 2ml / l.
- Fertilizers should be applied in June with 10 Kg of FYM, 50 g of ammonium sulphate, 250 g SSP and 100 g MOP per plant for two year and above aged plants.

Tuberose

- Life saving irrigations should be given to protect the plants in hot summer.
- If possible flower stalks should be removed to reduce the load on the plants and inputs.
- Protect the crop from sucking pests in summer by spraying Dimethoate 2ml/l or imidacloprid 0.4 ml/l.
- Apply fertilizers in June with Ammonium sulphate 50 kg and MOP 25 kg per acre.

Marigold

- Soil preparation should be done in May after lockdown.
- Nursery can be raised from first week of June to second week.

Gerbera

- Flowers scapes can be removed to lessen the load on the plants.
- Plant protection for sucking pests and leaf miner can be followed.
- To manage environment inside polyhouse side curtains should be raised between 7 AM to 5 PM.
- To maintain temperature and humidity side of beds should be kept wet by sprinkling water.

Chrysanthemum

- For ensuing season nursery preparation should be done in May and June.
- Terminal cuttings of 7-10 cm length should be treated with IBA 500 ppm for better rooting.

Advisory for Uttarakhand

G.B. Pant University of Agriculture and Technology, Pantnagar

The government of India has given several directions for exemptions during lockdown period. The sole purpose is to facilitate uninterrupted farm activities as well as to ensure essential supplies without facing much difficulty during lockdown. Flower growers and flower industry face serious problems amidst COVID-19 and lockdown.

General Advisory

- Maintain safe social distance of at least 1-1.5 m during field operations
- Take nutritional diet and have proper rest after the farm activities.
- All the workers should use masks, maintain hygiene and wash hands with soap after work.
- Person suspected to be infected with coronavirus should not be engaged in farm operations and he/she should immediately be quarantined.
- Avoid engaging of more workers during same day and if possible batch-wise work should be taken from workers.
- Follow proper sanitation procedure of all the equipments used in farm operations in order to avoid infection.
- Follow standard safety measures like use of masks, hand sanitation and social distance of at least 1-1.5 m during visit to the market for purchase of inputs. Crowding should be avoided at any cost.

Crop Advisory

- Harvesting of the seeds of winter season annuls can be undertaken by maintaining safe social distance of at least 1-1.5 m.
- As the weather is dry and no forecast of rain in coming days, harvesting of gladiolus corms can be delayed.
- Planting of tuberose can be deferred till first week of May.
- All the intercultural operations in polyhouse like weeding, hoeing and protection against pests and diseases can be done involving minimum number of workers.
- Flowers ready for harvesting can be stored in cold storage wherever this facility exists and drying of flowers or some other value added products can also be tried.
- Fertigation (half of the recommended dose) of greenhouse grown cut flowers through drip irrigation at regular intervals should be done.

Advisory for West Bengal **Bidhan Chandra Krishi Vidyalya, Kalyani**

Due to emergent situation of Covid-19 virus in the country, the floriculture sector has been adversely affected like many other sectors of agricultural. Demand and trade of floricultural items almost ceased. Though, the State Govt. has taken initiative on this aspect and decided to keep the flower market open in West Bengal under this lockdown situation also, still trade volume is negligible because of obvious reasons. Under this condition the growers should take care of their field for ensuring continuation of production in future. While working in the field farmers should maintain social distancing and other safety protocols like hand washing with soap etc. This is the season of tuberose, summer marigold and rose under open condition and gerbera and orchid (Dendrobium) under protected condition.

Tuberose

It is one of the most important crops in West Bengal grown for loose flower and cut flower production.

- This is the ideal time for planting of this crop.
- Growers may opt for the single floret varieties like Prajwal, Bidhan Snigdha, Bidhan Ujjwal, Shringar and Phule Rajani and the double floret varieties like Calcutta Double, Suvasini, Vaibhav, BR-19 etc.
- During final land preparation FYM or cow dung manure @ 5 tonnes, neem cake @50kg, mustard cake @ 50kg, horn meal 100kg, 10-26-26 (NPK) fertilizers @ 50kg and Carbofuran (Furadon) @ 5kg per acre may be applied.
- There is a major problem of nematode infestation (both foliar and soil nematode) in this zone. So bulb should not be taken from infected field for planting and before planting bulbs should be dipped into water containing 1% carbosulfan for one hour.
- High density planting (One lakhs bulbs/acre) is suggested for one year cropping with a spacing of 6x6 inches (plant to plant and row to row). After every four rows 15-18 inches space to be left for plucking of flowers and walking in between.
- For two year cropping system, spacing to be given 12x12 inches (row to row and plant to plant) and a 24 inches space to be left after four rows.
- Polythene mulch (40/50 micron) may also be used for better production and weed control.
- For the standing crop, as there is no demand of flower in the market, all old and newly emerged flower spikes may be removed with need based irrigation and plant protection measures.

Marigold

As there is little demand or no demand for flowers in the market, existing marigold fields should be maintained with need based watering and crop management practices.

- Control of Sucking pests like Thrips and White fly may be done with spraying of Imedachloroprid 17.8% S.L(Confidor or Jumboo @ 0.15%) at an interval of 15 days and Mites may be managed by application of Properzite 57% E.C (Simba or Omite@ @ 0.2%) or Fluphenoxyuron 10% E.C(Cascade @0.1%) or Dicofol 18.5% E.C(Kelthene @ 0.15%) or Diaphenthiuron 50% W.P(Pegasus or Polo @ 0.1%).
- Disbudding is to be done regularly till demand arise.
- Very old field/ plots (more than five months) may be destroyed.
- New planting can also be under taken in small scale. Recommended varieties are Seracole, Bidhan Gold and Bidhan Basanti.
- For new planting land should be prepared well. At the time of land preparation apply lime, if required, based on soil testing. Field should be prepared with FYM or cow dung manure @ 5 tonnes, neem cake @50kg, mustard cake @ 50kg, horn meal 100kg, 10-26-26 (NPK) fertilizers @ 50kg and Carbofuran (Furadon) @ 5kg per acre.
- After final land preparation, field should be irrigated and kept fallow for 7-10 days followed by ploughing. Before transplanting of unrooted cuttings, flood irrigation is to be provided.
- Need based watering to be done if rooted cuttings are planted. A spacing of 18x12 inches should be maintained for summer marigold.

Rose

- In existing fields remove old shoots and all flower buds. Light pruning may be done followed by spraying with copper oxychloride (Blitox 0.4%).
- Need based watering and crop management is to be followed.
- Control measure may be taken against thrips and mites by spraying of Imedachloroprid 17.8% S.L(Confidor or Jumboo @ 0.15%) at an interval of 15 days and Mites may be managed by application of Properzite 57% E.C (Simba or Omite@ @ 0.2%) or Fluphenoxyuron 10% E.C(Cascade @0.1%) or Dicofol 18.5% E.C(Kelthene @ 0.15%) or Diaphenthiuron 50% W.P(Pegasus or Polo @ 0.1%).
- Similarly against diseases like black spot, foliar spray may be done with Carbendazim (Bavistin @ 0.1%) + Mancozeb (Dithane M-45 @ 0.1%) or Difenconazol 25% EC(Score @0.1%) or Azoxystrobin 25% S.C (Amester @ 0.1%) or Chlorothalonil 75% W.P (Kavach @ 0.2%) at an interval of 10-12 days.) and for powdery mildew management spraying with Sulphur (Sulfex 0.3%), or Propiconazol 13.9% E.C (Tilth @ 0.1%), or Tabuconazol 50% W.G (Kalikur @ 0.1%) may be done at an interval of 10-12 days.
- New planting under open condition can also be done during this time. For this land may be prepared well with FYM or cow dung manure @ 5 tonnes, neem cake @50kg, mustard cake @ 50kg, horn meal 100kg, 10-26-26 (NPK) fertilizers @ 50kg and Carbofuran (Furadon) @ 5kg per acre. A row to row spacing of 36-40 inches and a plant to plant spacing of 18 inches may be followed for this zone. Polythene sheets can also be used for mulching under open cultivation.

Gerbera (Under Polyhouse)

- As the temperature is rising, proper watering by manual shower as well as through drip is highly essential.
- Run the gyronet sprinkler and fogger after 10 am at an interval of 1 hr. up to 4 pm. Spread the white shade net above and keep the sides open.
- Remove all flowers and regularly remove the young buds.
- It is not recommended to follow the fertigation schedule during this lean period rather this is very good time for application of organic manures.
- Apply 2 tonnes of well decomposed cow dung manure in the beds along with 25 kg neem cake, Azotobactor, Trichoderma and PSP at required quantities in 1000 sq m polyhouse.
- Control measure may be taken against whitefly and thrips by spraying of Imedachloroprid 17.8% S.L (Confidor or Jumboo @ 0.15%) at an interval of 15 days and Mites may be managed by application of Properzite 57% E.C (Simba or Omite @ 0.2%) or Fluphenoxuyuron 10% E.C(Cascade @0.1%) or Dicofol 18.5% E.C(Kelthene @ 0.15%) or Diaphenthiuron 50% W.P(Pegasus or Polo @ 0.1%).

Orchids (Dendrobium)

- Remove the aged flowers, young ones can be kept.
- Regular watering several times a day is highly required to maintain the humidity of the shade.
- Maintain the vegetative stage by applying more N and lower P or K.
- Apply nutrients NPK: 20:20:20 @ 1 gram per liter water at weekly intervals.



New Chrysanthemum varieties at ICAR-DFR

NATIONAL

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Floriculture



ICAR-DFR, Research Farm, Hadapsar, Pune 2018

ICAR- Directorate of Floricultural Research
College of Agriculture Campus, Shivajinagar
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