

Chamomile cultivation – Step towards rural prosperity

German chamomile (*Matricaria recutita* L.) is one of the most ancient herbs known to mankind. Essential oil of chamomile is used extensively in cosmetic industry and aroma therapy. Besides these, chamomile preparations are used for many human ailments and as herbal tea. It is also an ingredient of several traditional unani and Homeopathic medicines. It is an introduced crop in India and is mainly grown in Kashmir, Uttar Pradesh and Assam, and much credit goes to CSIR-CIMAP and Aroma Mission. Suitable agro-techniques have been developed by scientists so that farmers can grow chamomile and diversify existing cropping systems. Aromatic crops like chamomile can prove to be a milestone in doubling farmers income for sustainable agriculture.

THE german chamomile (*Matricaria recutita* L.) is mainly cultivated for essential oil. It is well-known medicinal plant species from the Asteraceae family often referred to as the “star among medicinal species”. Chamomile is a native of Europe and adjoining Asian countries. The essential oil is produced mainly in Argentina, Egypt, France, Germany, Hungary and Yugoslavia. In India, seeds were brought from France in early 1950s for experimental field trials in Regional Research Laboratory in Jammu and later All India Coordinated research Project on Medicinal and aromatic crops at Solan centre and agro-techniques were developed. Today, CSIR-CIMAP is the leading institute working on this crop for developing improved varieties and agro technology. Today the main centres of the crop are Jammu and Kashmir, Uttar Pradesh and Assam. The oil of chamomile is known as Blue oil in market. About 40 different compounds were identified in chamomile essential oil that the most important ones included sesquiterpenes, chamazulene, b-farenzn, bisabolo oxide A, and bisabolo oxide B. In chamomile oil, there are 120 components which are identified by different researchers but only

two major components are for our use i.e. α -bisabolol and chamazulene (17-18%). They directly involve in reducing inflammation and both are mild anti-bacterial.

Nowadays it is a highly used medicinal plant in folk and traditional medicine. It's multitherapeutic, cosmetic, and nutritional values have been established through years of traditional and scientific use and research. Blue oil of chamomile is used in perfumery industries as well as

having medicinal importance like face creams and sun burn and flavouring fine liquor. Extract of chamomile is useful in stomach disorders, to cure ulcer problem and wounds healing. Flower of chamomile is used as herbal tea and it is very common in China. Chamomile oil is also used as baby massage oil, for promoting gastric flow secretion and in treatment of cough and cold. Due to it's high pharmacological and pharmaceutical properties, plant has great economic value and is in great demand in the Asian and European countries.

Improved varieties

CSIR-CIMAP has released many improved varieties of chamomile like Vellari, Prashant, CIMAP-Sammohak and CIM-Ujjwala.



Overview of chamomile crop



Chamomile flowers after picking

Field preparation

Two deep ploughings are recommended to make soil fine texture for good crop establishment. Level the field properly so that water logged condition should not be there and another advantage of land levelling is that it helps in saving water by uniform distribution of water in the field whenever irrigation is applied. Drainage facility should be there in the field.

Irrigation

First irrigation is applied just after transplanting and rest irrigations are to be done as per need. Normally, the crop requires 2-3 irrigation in its crop duration.

Manures and fertilizers

Apply 10-15 tonnes of well rotten FYM or apply 5 tonnes of Vermicompost at the time of field preparation. Synthetic fertilizer

should be applied on soil test basis but in general, apply nitrogen, phosphorous and potassium in the ration of 80:40:40 Kg/ha. Full dose of phosphorous and potassium at the time of transplanting and nitrogen dose should be applied in 4 splits in equal quantity at equal interval and 3 splits before flowering and 4th dose after first picking of flowers.

The cultivar Prashant is superior to Vallary in all respects like plant height (85 cm), diameter of the capitulum (1.5) and gross oil production (22%).

Climate

It can be grown as winter crop in plains of North India and as summer crop in the hills of J&K, Himachal Pradesh and Uttar Pradesh. Chamomile plant grows well when the temperature is in between 30-32°C with a humidity of 40-50%. If the temperature exceeds 38°C or above, the plant growth and flower bud formation is affected.

Soil requirement

It can be cultivated in wide range of soils but light texture and low water holding capacity soil should be avoided. Chamomile cultivation is possible on medium and heavy texture soil. For good establishment of plants, soil should be well drained, crumbly, levelled and slightly slopy in nature. Sometimes chamomile plant can be grown in sodic soil as it can tolerate the sodic condition up to some extent.

Propagation

Chamomile is propagated through seeds during Oct-Nov in north Indian plains and March-April in the hills. Plants can be transplanted after 6-8 weeks.

Direct sowing: Sowing should be done in lines but in this method more seed is required.

Nursery raising and transplanting: For commercial production of chamomile plant, raising of seeding in nursery is recommended. Raised bed of 4 × 1 m² or 5 × 1 m² are prepared by mixing good amount of FYM or compost in the soil. About 0.501 kg seed is required for raising nursery for 1 ha area. Sowing of nursery is done in the month of October-November and in the mid of November, transplanting of seedlings is done at a distance of 50 × 30 cm.

Weed management

To control weeds in the early crop growth stage is an essential interculture operation otherwise the crop yield may get affected. The uncontrolled weed growth caused about 35% reduction in the dry flower yield as compared to weed free condition. Generally 3-4 hand weedings are required for good crop. Chemically, there are so many herbicides for weed control in chamomile crop such as 2,4-D, atrazine, trifluralin and oxyfluorfen. Application of oxyfluorfen @ 0.6 kg/ha give better result.

Pest and diseases

Insects: Aphids, mealybugs, spider mites cause severe damage to the chamomile plants. To control the insect attack and their infestation, (may) use natural bio-control agent like lady bird beetle or wasp and for mealybug control, spray neem oil which is an effective agent.

Diseases:

Powdery mildew: Formation of white powder growth on the foliage parts of the plant. To control this, spray any of the following fungicide such as captan/bavistin/ Dithane M-45 @ 0.2-0.3%.

Damping off: Plant wilts and dies. To control this disease, drain out the excess moisture from the field and reduce the nitrogen dose.

Root or crown rot: It cause yellowing of leaves and then branches to turn brown and death of the plant. To control this, reduce too much irrigation, standing water is the main cause.



Chamomile

Flower picking

This is an important and laborious operation in chamomile crop. So for picking purpose, sufficient labour should be available. Only fully developed flowers should be picked. Flowers are ready for first picking after 65-70 days of transplanting and then subsequent picking should be done at 15 days interval and last and second last picking should be done only for seed purpose.

Drying of flowers

As the fresh flowers of chamomile contain about 70-80% water. Picked flowers should be immediately transferred to the drying shed and spread over ground in very thin layers of 1-2 cm and allowed them to dry till flowers loose 45-65% moisture.

Distillation

Steam distillation method is an appropriate method for oil extraction from dried flowers of chamomile.

Oil content and yield

The flowers yield a blue oil containing 1-15% azulene. It is used in pharmaceutical industry, to flavour high quality wine, tea and in perfumes. Oil percentage- 0.80%, oil yield- 7-8 kg/ha, dry flower- 7-8 quintal/ha. Flower

yield may vary because it depends on soil fertility status, management practices and number of pickings.

Benefit: Cost ratio

Cost per hectare: ₹ 75,000/- per annum; income per hectare: ₹ 1,70,000/- per annum; net benefit per hectare: ₹ 95,000/- per annum.

SUMMARY

There is good potential for chamomile cultivation as commercial crop in India. Since it is a valuable crop for aroma industries and has high export value, it is necessary to promote this crop among small and marginal farmers, to secure their livelihood. CSIR-CIMAP with all other leading scientific institution is working hard to increase its area, its inclusion in existing cropping systems and adoption on large scale for bringing rural prosperity and self reliant India.

For further interaction, please write to:

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