Agrotechniques for cultivation of some HOMOEOPATHIC MEDICINAL PLANTS

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Introduction

Medicinal plants are indeed miracle laboratories of nature where complicated organic compounds are manufactured by intricate processes within the plant cells. These substances or plants have been utilized since time immemorial for the benefit of human race all over the world. India is bestowed with a treasure of medicinal plants. It is a land of extreme diversity with snow covered Himalayas and arid zones together with evergreen tropical forest, which is best suited for a natural vegetation of all types of plants. WHO (World Health Organisation) has listed over 21,000 plant species used around the world for medicinal purposes. It has been estimated that India has 47,000 species of plants. Out of these, medicinal plants comprise 8,000 species.

In recent years Homoeopathic System of Medicine and herbal drugs has gained much popularity and preference over heavily flourishing synthetic drugs and antibiotics, since the former are comparatively harmless and can provide long standing or total cure of various diseases. The availability of genuine raw material is the main concern in adopting the latest trend of natural products. Due to the ever increasing utilization of land for food crops and urbanization, the natural sources i.e. forests are declining. Though India is on the map of herbs exporters, it has to import several of the Homoeopathic herbals with few crores of rupees annually. Homoeopathic system of medicine is mainly dependent on about 1200 plants as source of medicine, out of these 40% are reported growing in India, while about 60% are of foreign origin.

The varied climatic and edaphic richness of India permits plant growers to cultivate different types of plants in different regions, including indigenous and exotic species of plants. Some exotic species which are used both in Ayurvedic and Homoeopathic systems of medicines, though naturalized in various parts of India and found growing in gardens and as wild are in demand in Indian and foreign market hence their commercial cultivation needs to be encouraged. These species include: Adonis vernalis Linn., Arnica montana Linn., Berberis sp., Cactus graminiflorus, Cineraria maritima Linn., Hypericum perforatum Linn., Echinacea angustifolia, E. purpurea (Linn.) Moench, Tanacetum parthenium (Linn.) Schultz-Bip., Silybum marianum Gaertn., Podophyllum peltatum Linn., Pimpinella anisum Linn., Valeriana officinalis Linn., Ginkgo biloba Linn., Digitalis purpurea Linn., Hydrastis canadensis Linn., Lycopus virginica, Nepeta cataria Linn., Myosotis spp., Ruta graveolens Linn., Tanacetum spp., Ginseng, etc.

Though some Government and non-Government organizations have started work on cultivation of medicinal plants, cultivation and introduction of medicinal plants used chiefly in Homoeopathy has not been taken up. Therefore, to preserve the germplasm of such plants, Homoeopathic Pharmacopoeia Laboratory, Department of ISM&H, Ministry of Health & Family Welfare, Ghaziabad has taken up cultivation of some plants on experimental basis.

The laboratory has been successful in introducing and cultivating a number of exotic plants viz.: Agrostemma githago Linn., Artemisia vulgaris Linn., Anthemis spp., Ammi visnaga (Linn.) Lam., Apocynum cannabinum Linn., Achillea millefolium Linn., Baptisia spp., Borago officinalis Linn., Cactus grandiflorus, Cnicus benedictus Linn., Catalpa bignonioides Walter, Chamomilla
Ammi visnaga (Linn.) Lam. (Khella) (Apiaceae)

A hardy robust herb up to 1.5 m in height with a long tap root. Leaves deltoid, 5-20 cm long, pinnately decompound, ultimate divisions linear to filiform; flowers white; fruits oblong-ovoid, 2.0-2.5 mm long. It is indigenous to Egypt, found in Fayoun and basin of the Mediterranean Sea, in Syria and Palestine. In India it is cultivated as a garden herb and often met with as an escape in waste places.

In Homoeopathy, it is used in vasodilation for bronchodiatory effect, in the treatment of angina pectoris, and in asthma along with other drugs.

Cultivation: The plant/crop is grown from seeds. A mild cool climate in early stages of crop growth and warm dry weather at maturity is ideal. A well drained loamy soil is preferred but it can be grown on a variety of soils from sandy-loam to clay-loam.

About 2.0 to 2.5 kg seeds are sufficient to sow one hectare of land. The seeds are sown during October - November in furrows and are covered with thin layer of soil. The seeds germinate within 15-20 days of sowing. The spacing recommended between plants is 60 cm x 60 cm and for better yield it requires hoeing and weeding at regular interval during initial stage of growth. If there is winter rain, 3-4 irrigation meet the water requirement of the crop. Farmyard-manure is required at the time of seed sowing and transplanting. NPK fertilizer can be used for better results.

The harvesting of the crop is spread over a long period because fruiting umbels do not mature simultaneously. The primary umbels mature first in the month of April whereas entire crop is harvested by the end of May and stored for a couple of days before thrashing the seeds. The average yield of the crop is between 1000 to 1200 kg per hectare.

Seed source: Seeds obtained for trial cultivation from France.
**Article**

It is of Mediterranean origin and native to Portugal, France and Algeria. In India it is cultivated in the temperate regions of the Himalayas for medicinal purposes and as a border plant. It has run wild at several places.

The plant contains very valuable essential oil, which is used in cosmetics and perfume industry. The decoction of inflorescence is used for the treatment of hair and head skin. In folk medicine, it is used as a sedative, pain killer, antispasmodic and sedatory agent. In Homoeopathy, it is used for gastric disturbances with coldness and sensitivity to cold air.

**Cultivation:** It requires warmth and sunshine and grows on any warm soil; however, the best soil is medium farm humid soil, which is rich in humus. The water requirement of the crop is high, especially at the time of root development. Organic fertilizer is preferred. But as basic fertilizer 100-140 kg/ha of P2O5 and 60-70 kg/ha of N can be introduced into soil at the time of ploughing.

It can be propagated by root division and seeds. Sowing is done during October-November. Planting should be done after rains or irrigation with 60 × 60 cm row spacing and 20-25 cm plant distance. The field should be repeatedly irrigated. The crop is harvested in full flowering during April-May; cut in small pieces and dried in shade. The yield is 150-200 kg/ha of flower drug and 3-4 tonne/ha fresh plant.

**Seed source:** Seeds obtained from France for experimental cultivation.

**Cineraria maritima Linn.**
(Dusty miller) *(Asteraceae)*

Dusty miller is an important medicinal plant in Homeopathic system of medicine. It is native to Mediterranean region. It is an old-fashioned garden plant in Europe and at the present time it is much used in American garden for ribbon bed and margins.

The plant contains alkaloids of pyrrolizidine group, mainly senecionine, jacobine, retrogine and odosenine. The sterilized juice of fresh whole plant excluding roots collected just before flower buds open is used for treatment of capsular and centricular cataract of eye. It has reputation to cure cataract and corneal opacities caused by metabolic disorders like diabetes, gouty condition and old age. It is used externally by instilling into the eye one to two drops 3-4 times a day, which should be continued for several months.

**Cultivation:** The crop grows in temperate region up to an altitude at 2000 m and can be grown in tropical and sub-tropical region in the winter season. The optimum temperature for plant growth is 10-26°C. It grows well in medium firm sandy soil or good garden soil.

**Cineraria can** be propagated by seeds and cuttings. The plants are best raised by stem cutting. The seeds are sown in nursery beds during September-October and seedlings transplanted in autumn or spring at spacing of 30x30 cm. Stem cuttings or shoots of 10-15 cm long from mature plant are transplanted in good garden soil having well decomposed farmyard manure in the month of October in temperate region and in tropical region it should be planted in the middle of December.

The crop should be given 15-20 tonnes of farmyard manure per hectare before transplanting. Nursery beds and field after plantation should be irrigated periodically as and when required; weekly or fortnightly weeding and hoeing is necessary for better yield.

The plant is harvested before flower buds open and cut in small pieces and dried in shade. The yield is 150-200 kg/ha of flower drug and 3-4 tonne/ha fresh plant.

**Seed Source:** Seeds obtained from France and Delhi market.

**Chamomilla recutita**
(Linn.) Rausch.
(German or Hungarian chamomile) *(Asteraceae)*

It is a herb of great medicinal and aromatic importance. Chamomile is native to Europe being cultivated extensively in Germany, France, Hungary and Russia. It is a small herbaceous annual plant growing to a height of 60-90 cm. The stem is erect having side branches; leaves pinnatifid, segments very narrow, linear. Flower head is solitary, 1.5 to 2.5 cm in diameter and each flower is borne on a...
hemispherical or conical hollow receptacle surrounded by involucre of 2-3 rows of small imbricate bracts. Fruit is an achene and seeds are generally less than 1.0 mm, rounded and pointed at end. A single head produces 40-50 seeds.

The main active substances of the flower are the essential oil, accumulating to 0.2-1.5 per cent, and the antispasmodic, abigenin and kolin (2.5-3 per cent). Inflorescence contains significant amount of flavonoids, glycoside, polysaccharides, resins and vitamin C.

It is amongst the medicinal plants known for the longest time. The healing effect of the plant is reported in the ancient Egyptian and Greek literature. Its inflorescence and essential oil are also indispensable in modern medical practice. It is an official drug in all pharmacopoeias and used as anti-inflammatory, antispasmodic and antiseptic drug. The oil is used in cosmetic industry to prepare skin care products. Extract of the plant possesses antibacterial and antifungal properties. Tea, known as Chamomile Tea is also made from inflorescence.

In Homoeopathy it is employed in diseases of children, where peevishness, restlessness and colic the indications; and in complaints of children such as teething diarrhoea, green foul stool, with colic; toothache by warmth and throbbing headache in half part.

**Cultivation:** In winter season it can be grown in the tropical and sub-tropical regions and in summer it can be grown in temperate zone also. It requires mild cool climate at initial stage and warm dry weather at the time of maturity. Chamomile can be grown in variety of soil but it prefers slightly heavy soil rich in humus and having alkaline pH (around 8). The optimum temperature for germination of seed is 15-20°C but germination starts at 6-7°C.

Seeds are grown in October in well prepared nursery beds. One kilogram seeds provide the required number of seedlings for transplanting in one hectare land. Seed beds are covered with a mixture of farmyard manure and soil and kept moist by light irrigation. Seeds germinate within 15 days and seedlings are ready for transplanting in 6-8 weeks.

The seedlings at four to five leaf stage or when they are about 6-8 cm high are transplanted in to well ploughed field in the month of November at a space 30 × 30 cm.

The crop should be given 20-25 tonnes of farmyard manure per hectare before transplanting. For high yield of flowers, 60 kg N/ha and 30 kg each of P₂O₅ and K₂O/ha is also required. It is hardy crop, requires 4-6 irrigation in the entire season and usually, 2-3 weeding and hoeing for a good yield.

It starts flowering from second week of February and continues till April in plains. The flowers should be picked at the full bloom stage, 4-5 harvest, can be taken at an interval of 10-15 days.

The maximum yield is obtained in the 4th week of flowering. These flowers are spread under shade for drying; the ideal temperature for drying is 20-24°C. The whole plant at flowering stage is harvested for preparation of Homoeopathic medicine. An average yield is 30-45qt/ha of fresh flowers.

**Seed Source:** Seeds obtained from France.

**Cnicus benedictus Linn.**
(Blessed thistle) (Asteraceae)

It is an annual herbaceous plant, found in Europe on road side and scarcely naturalized in the U.S. The plant has tap root; stem branched, five edged, bristly on lower side, and viscous glandular on upper part. The leaves are 5-7 cm long, lanceolate, sinuate lobed with sharp pointed teeth. The capitulum is terminal, ovate and is light yellow, bisexual and tubular. Fruit is an achene, 1.0 cm long, cylindrical, slightly curved and with prickly pappus at its top.

All plant parts contain sesquiterpene bitter substance, cnicin, which is 0.2 per cent on an average. It also contains 5-10% mucilage, 8% tannins and 0.3% essential oil.
The herb has been used for a long time in therapeutics, owing to its digestive and stomachic effect. It was used in middle ages against tumours of stomach and bowel and in sixteenth century for preventing and treating plague. Nowadays it is an ingredient of tea blends and tinctures and heals certain diseases of the respiratory and digestive systems.

In Homoeopathy it used in amaurosis, diarrhoea, eye affection, fever, headache.

**Cultivation:** The crop can be grown in the tropical and sub-tropical zones in the winter season and in summer it can be grown only in temperate region up to an altitude of 2000 m. The optimum temperature for seed germination is around 10 to 12°C. It grows well in medium-firm or brown, sandy soils rich in nutrients.

Farmyard manure is preferred but for getting high yields, basic fertilizer may be added at the time of ploughing by introducing 40-60 kg/ha of N, 40-45 kg/ha of P₂O₅ and 40-50 kg/ha K₂O in the soil.

Blessed thistle can be sown in autumn or during October/November linearly at the optimum depth 2-3 cm. The seeds germinate within ten days of sowing and plants are established within 15-20 days. Thinning and hoeing can be performed when the first foliage leaves appear.

Plants can be harvested when the first flowers appear. During harvesting use of protective gloves is advised. The first cutting takes place in the middle of April. The second cutting is done in the same way after one month of first cutting. It should be cut in small pieces and dried in shade or artificially in driers immediately. The expected yield is about 1.5 to 2.0 tonne/ha of dry herb.

**Seed Source:** Seeds were obtained from France for trial cultivation.

**Nepeta cataria Linn.** *(Catnip) (Lamiaceae)*

An erect, hoary, pubescent, perennial, herb, 60-100 cm in height. Stem erect, quadrangular, branched. Leaves ovate, oblong, cordate, pointed, about 8 cm long, having scalloped edges, grey or whitish hairs on lowerside. Flowers bilabiate, white with purple spot and grow in spikes. Seeds small and brownish-black. It is native to Eurasia and widely naturalized in North America. In India it is found in western temperate Himalayas from Dalhousie to Kashmir, up to 1,500 m.

The plant contains essential oils, acids and tannins. Other compound are nepetalic acid, nepetalic anhydride, dispenine and β-caryophyllene.

The herb is used as an antispasmodic, carminative, diaphoretic, emmenagogue, nervine, stomachic, stimulant and mild sedative. It is also used in the treatment of diarrhoea, colic, common cold and cancer. In Homoeopathy it is used in coryza and infantile colic.

The plant has ornamental and culinary value. Dried leaves and flowering tops are used as a spice to prepare sedative tea and also used for flavouring sauces, soups, etc.

**Cultivation:** The propagation can be done by root division or seeds. Plant thrives well in sandy loam soil with farmyard manure. Soil having pH 4.5-7.5 and temperature between 10-20°C is most suitable for plant growth. Seeds are grown in open-air seed beds with a row distance of 25-40 cm in the spring. The depth of sowing is 1.5-2.0 cm. Seeds germinate within 15-20 days. The seedling should be transplanted in the field with 40-60 cm row distance and 30-40 plant spacing. The crop should be irrigated periodically as and when required weekly or fortnightly and it should be weed free for better yield.

It can be harvested once or twice in a year during flowering and allowed to dry in the shade to preserve colour and fragrance. The expected yield is 1.0-2.0 tonne/ha of dry drug.

**Seed Source:** Seeds were obtained from France for experimental cultivation.

**Ruta graveolens Linn.** *(Garden Rue) (Rutaceae)*

A strong-scented, erect, branched; glabrous, herb or sub-shrub, 30-90 cm in height. The root is woody, branched and yellowish brown. Leaves alternate, pinnately compound; segments oblong to spathulate, covered with a bloom and strongly aromatic. Flower small greenish-yellow in corymbs. Fruit is a capsule covered with glands; seeds three edged, reniform, dark brown. It is native to eastern part of Mediterranean region. In India it is some times cultivated in gardens.

The plant contains flavonoids especially rutin, which have antispasmodic effects. The leaves yield rutarin glycoside and furanocoumarins. The pungent odour of the plant is due to essential oil. It also contains toxic alkaloids, quinoline and furanocoumarinol.
Sambucus nigra

urine and help to eliminate urinary
problems.
In Homoeopathic systems of
medicine, it is used for coryza of infants,
dry and obstructed nose, acute nephritis
and oedema or swellings. It acts especially
on respiratory organs.

Cultivation: It can be propagated from
seeds and stem cutting on a variety of soil
but sandy loam soil with organic fertilizer/
farmyard-manure gives better yield. The
seeds are grown in nursery beds during
September-October. One year old
seedlings are transplanted in the field
during autumn. The vegetative propagation
by shoots or thin stem/branches is done
during rainy season. The cuttings or
seedlings are transplanted in the field
with a 2.0 to 3.0 m row distance and 1.0 to
1.5 m plant distance. Periodic irrigation
and weeding is required at the initial stage
of crop. After establishment of plants field
should be irrigated as and when required.

The harvesting of flowers can be
started when the extreme flowers of
dichasium are open, but central flowers
are still in buds. Flowers should be
gathered chiefly in dry season. The
harvested drug should be dried in shade and stored. The average yield is
2.5-3.0 tonne/ha of dry herb.
Seed Source: Seeds obtained from
France for experimental cultivation.

Sambucus nigra Linn. (European
Elder) (Caprifoliaceae)

A spreading shrub or small tree
up to 6m in height. Branches greyish,
lucentellate, white and soft inside. Leaves
are compound, imparipinnate, petiolate;
leaflets 3-7, short-stalked, orbiculate.
Inflorescence is a dense, flat dichasium,
flowers yellowish-white and having
characteristic odour. Fruit globose, 6-8
mm across, purple or black, juicy. It is
found along the borders of forest in
shaded and humid places all over Europe.
In India it is reported to grow wild in
Kangra and in Shimla hills in Himachal
Pradesh.

Flowers contain 0.1-
0.2 per cent essential oil,
glycosides, flavonoids,
tannins, sugars and vitamins
A-C. The aerial parts and roots
are diuretic, emetic and
purgative. Flowers are
diaphoretic. A tea made from
leaves and young shoots
increase the production of

Ruta graveolens

It is a well known medicinal plant
in Europe. Leaves and dried herb have
been used in folk medicine to heal a
number of diseases. Now-a-days it is used
as a basic material in tea blend for healing
gall bladder disease and high blood
pressure.

It acts upon the periosteum and
cartilage; it is used in ocular pain due to
over strain, eye strain followed by
headache and painful eyes after sewing or
reading fine prints all type of nerve and
muscular painful affections of extremeties,
lameness after sprain, feeling of intense
lassitude, weakness and despair, injured,
bruised bones.

Cultivation: It is cultivated mostly from
seeds. The seeds retain their germination
ability for 2-3 years. Sandy-loam soil with
well decomposed farmyard manure was
found best for germination as well as
better survival of seedlings and
productivity. Sowing is done in well-
prepared open air beds with a row spacing
20-30 cm and 1.5-2.0 cm depth in the
autumn. The optimum temperature for
germination is 15-18°C. The seeds
germinate within 20-30 days, after
germination, field should be kept free
from weeds. The seedlings of 20-25 cm
height can be planted in the field at 30-40
cm row and plant distances. It is necessary
to irrigate the field after planting. After
establishment plants are to be irrigated as
and when required weekly or fortnightly.

One year old plant can be
harvested during flowering. At this stage it
contains maximum percentage of active
ingredients. The cut plant should be dried
in shade and stored. The average yield is
2.5-3.0 tonne/ha of dry herb.

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dichasium are open, but central flowers
are still in buds. Flowers should be
gathered chiefly in dry season. The
harvested drug should be dried in shade or
artificially in drier at 35-40°C. Five to
six kg flowers are required for 1 kg of dry
drug.
**Seed Source:** Seeds were obtained from France.

**References**


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**WHO CAN HELP IN THE CULTIVATION OF ECONOMICALLY IMPORTANT PLANTS**

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<th>The Chief Executive Officer</th>
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Natural Product Radiance, November-December 2002