AGRO-TECHNIQUES FOR CULTIVATION OF
SOME MEDICINAL PLANTS

A

SYNOPSIS
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By
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INTRODUCTION

Medicinal plants are natural 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 use of human race all over the world. India is a treasure of medical 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 organization) has listed over 21,000 plants 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 (Rajat Rashmi, 2002).

In recent years, medicinal 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 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 herbals with few crores of rupees annually. Homoeopathy system of medicine is mainly dependent on about 1,200 plants are source of medicine.

The varied climatic and edaphic richness of India permits plant growers to cultivate different types in different regions, including indigenous and exotic species of plants. Some species which are used medicines, through naturalization 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 spp., Cactus graniflorus, Cineraria maritime Linn., Hypericum perforatum Linn., Echinacea angustifolia, Echinacea purpurea Linn., Moench, Tanacetum parthenium Linn., 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., Myositis spp., Ruta graveolens Linn., Tanacetum spp., Ginseng, etc.

Cultivation and introduction of medicinal plants used chiefly in medicines has not been taken up. Therefore, to preserve the germplasm of such plants, Department of Botany Meerut College, Meerut been taken up for cultivation of some plants on experimental basis.

Since some plants are uncommon to the growers and there are only a few reports on their cultivation, an attempt has been made to work out available information and the agro-techniques developed.

THE HISTORY OF MEDICINAL PLANTS

EARLY HISTORY

From earliest time mankind has used plants in attempt to cure diseases and relieve physical sufferings.

In all the early civilizations there was much interest in drug plants.

Ayurveda, a very old Indian system of medicines prevailing successfully even today was revealed by Maharishi Dhanvantri crores of years back.

Thereafter, several great Indian scholars such as Ashwani Kumar, Maharishi Shrangi, Charak and Shushrut wrote many valuable treatises on this system, but unfortunately most of them except Charak Samhita and Shushrut Samhita are not available today.

Vedas, the authentic Indian literature known to the world since time immemorial, mentioned about several medicinal plants and their utility mankind, e.g., it is mentioned in ‘Vedas’ that chaulmoogra oil helped in curing leprosy. This oil is obtained from the seed of Hydnocarpus (Flacourtiaceae, a native of India. Europeans did not know about this oil until the middle of the nineteenth century.

In China as early as 5000 to 4000 B.C. many drugs were in use.

There are Sanskrit writings in existence which tell about the methods of gathering and preparing drugs.

The Assyrians, Babylonians and ancient Herbrews were all familiar with their use.
Code of Hummurabi in the form of a series of tablets carved under the supervision of the king of Babylon about 1770 B.C., contains several records of the use of plants in medicine.

Some of the Egyptian papyri, written as early as 1600 B.C., record the name of the man of the medicinal plants used by the physicians of that day, among them are myrrh, cannabis, opium, aloes, hemlock and cassia.

The Greeks were familiar with many of the present day drugs, as evidenced by the works of Aristotle, Hippocrates, Pythagoras and Theophrastus. Hippocrates (460-377 B.C.) discussed the illness and treatment of several diseases in a chronological manner and earned his reputation as the ‘‘Father of Medicine’’.

The Romans were less interested in healing plants. However in 77 B.C., Dioscorides wrote in great treatise, De Materia Medica, Which dealt with the nature and properties of all the medicinal substances known at that time, followed by Moors and Turks for fifteen centuries.

Secundus compiled Historia Naturalis in 77 A.D., and described over 1000 plants medicinal importance.

AFTER THE DARK AGE

After the Dark Ages were over, there came a period of the herbalists and encyclopedists. About this time the curious Doctrine of Signatures came into being. According to this superstitious doctrine all plants possessed some sign, given by the creator. Thus a plant with heart- shaped leaves should be used for heart disease, their lobed leaves for liver troubles, and so on. Such name as Heartsease, Solomon’s-seal, dogtooth violet and liverwort carry on the old superstition by monasteries of Northern Europe.

PHARMACOGNOSY AND PHARMACOLOGY

From this crude beginning the study of drugs and drug plants has progressed until now pharmacognosy and pharmacology are essential branches of medicine, and Botany and medicine have gone hand in hand.
PRESENT STATUS OF INDIAN SYSTEMS OF MEDICINES AND HOMEOPATHY

The Ministry of Health and Family Planning, Government of India, has established a Department of Indian Systems of Medicines and Homeopathy, which has new goals, new initiatives. The nation marches ahead with confidence.

Before, convincing the farmers of Uttar Pradesh to start the commercial cultivation of aromatic and medicinal plants in their agricultural fields, it is necessary to educate them about the importance of globalization of Indian system of medicines, Activities through Medicinal Plant Board. Achievements and new initiatives, so that they can enhance their income and become enthusiastic to enter this new field of agriculture in the state of Uttar Pradesh.

GLOBALIZATION OF INDIAN SYSTEMS OF MEDICINE

1. New concept of medical tourism to promote Indian Systems of Medicine and Homeopathy on anvil.
2. The government of Russian Federation has recognized Panchakarma treatment and is in the process of recognizing Kshar Sutra.
3. Participated in Expo 2002 at Hannover, Germany- Ayurveda, Yoga and Meditation attracted more than 10 lakh visitors from Germany from June to October, 2000.
4. Conference on Ayurveda held in New York inaugurated by Hon’ble Prime Minister of India in September, 2002.
7. Yoga demonstration and lectures on Indian Systems of Medicine arranged for 10 institutions in Tajikistan.
ACHIEVEMENTS

1. High powered medicinal plant board set up to promote sustained availability of medicinal plants and to coordinate all matters relating to their development and sustainable use.

2. State drug testing laboratories and pharmacies upgraded to enforce quality control of IISM and H drugs and augments production of standard drugs of government pharmacies.

3. Good manufacturing practices for ISM drugs notified.

4. New extra – mural scheme introduced to finance collaborative research for scientific validation of ISM drugs and therapies.

5. Scheme for recognition of private laboratories as government approved laboratories to undertake testing of identity, purity, quality and strength of ISM and H drugs introduced.

6. 313 blocks in the country take up propagation of ISM and H strategies through Non-Governmental Organizations.

7. Essential drug lists for Ayurveda, Unani and Homeopathic medicines issued.

8. 49 homeopathic drugs made available at licensed pharmacies (chemists shops) to improve their access to public.

9. Scheme for accreditation of panchakarma facilities finalized for seeking accreditation.

10. Agro-techniques ready for 30 medicinal plants out of 140 awarded.


12. Financial assistance upgrade facilities in UG and PG colleges of ISM and H.

13. State Medical College hospitals assisted for improving patient care services.

ACTIVITIES THROUGH MEDICINAL PLANT BOARD

1. Encouragement for cultivation of selected medicinal plants backed by buy – back arrangements.
2. Registering raw drug traders.


4. 28 selected priority medicinal plants like brahmi, ashwagandha, atis, guggal, sanai, musli etc., which are in great demand both in domestic and international markets to be brought into cultivation status for the overall development of the medicinal plant sector.

5. Specialized surveys of the International Market for Medicinal Plants and products to be undertaken for identifying niche areas.

6. Registration of farmers / cultivators of medicinal plants to be entrusted to the respective state medicinal plant boards / Vanaspati van societies.

7. Manufacturers / NGOs and Representative individuals to be supported for participation in International fairs, Seminars and Meetings with a view to create awareness and explore the international market for plant-based herbal products.

8. R and D studies in the areas of the post harvest management, shelf life, storage and simple agro-techniques to be taken up through CSIR, NBRI, PRLs, DBT, Horticulture and Forest department.

PLANT DERIVED MEDICINES

For the purpose of commercial cultivation of medicinal plants the farmers are the most interested to sow the drugs only. The drug plants are collected from different sources and farmers should know that from which part of the plant, the drug can be obtained. Therefore, it is necessary to educate the farmers about the drug plants and their importance. A few drug plants are selected for cultivation on a commercial level.

REVIEW OF LITERATURE

A perusal of literature reveals that commercial cultivation of medicinal plants has been taken up only in a few institutions and NGOs i.e., Central Institute of Medicinal and Aromatic Plants, Lucknow, Indian Institute of
Ahmad et al. (1996) have concentrated on the alkaloids contents of Senacio.

Chadha and Gupta (1995) has discussed some advances in horticulture specially on Medicinal and Aromatic plants.

Rajat Rashmi (2002) has cultivated Cineraria maritima Linn. (Asteraceae), Chamomilla recutita Linn. (Asteraceae), Ammi visnaga Linn. (Apiaceae), Anthemis nobilis Linn. (Asteraceae), Cnicus benedictus Linn. (Asteraceae), Nepata cataria Linn. (Asteraceae), Ruta graveolens Linn. (Rutaceae) and Sanbucus nigre Linn. (Caprifoliaceae)

**PROPOSED WORK TO BE DONE**

**Materials and Methods**

The sowing and propagating materials will be locally collected, preserved, properly identified and stored.

During plant collection the source material will be segregated depending upon the drug obtained from which part of the plant as under.

a. Drugs obtained from root and underground parts.

b. Drugs obtained from bark.

c. Drugs obtained from leaves.

d. Drugs obtained from flowers.

Some materials will be procured from any institute, from the list of “Who can help in the cultivation of economically important plants.”

1. The Chief Executive Officer
   National Medicinal Plants Board
   (Department of ISH and H)
   Ministry of Health and Family Welfare
   Government of India
   36, Chandralok Building, Janpath
   New Delhi-110 001
2. The Director
Central Institute of Medicinal and Aromatic Plants
P.O.CIMAP (Near Kukrail picnic spot)
Lucknow-226015, Uttar Pradesh

3. The Coordinator
Tropical Botanical Garden and Research Institute (TBGRI),
Pallode, Thiruvananthapuram-695562, Kerala

4. The Director,
Institute of Himalayan Bioresource Technology,
Post Box No.6, Palampur-176061
Himachal Pradesh.

5. The Director,
Regional Research Laboratory,
Bhubaneswar-751013, Orissa.

6. The Director,
Regional Research Laboratory,
Canal Road, Jammu-18000, J&K.

7. The Director,
Regional Research Laboratory,
P.O. Jorhat-785006, Assam.

8. The Managing Director,
Hind Agro Industries Limited,
B-3, Friends Colony (West),
Main Mathura Road, New Delhi-110065

9. Dr.V.P.Gupta
Director,
Department of Biotechnology,
Block-2, 7th floor, CGO Complex,
Lodhi Road, New Delhi-110003

10. Dr.N.Barathi,
    Director,
    Growmore Biotech Limited,
    41-B SPCOT Phase-II,
    Hosur-635109 (T.N.)
Preparation of beds/ plot
Proper beds will be prepared. The soil will be tested and proper manure will be mixed.

Sowing
- It will be done in proper time and irrigated. Date of sowing will be noted.
- Harvesting will be done at maturing.
- Cultivation details will be given.
- Drug obtained will be identified.
In the present study of locally available medicinal plants will be taken up. More stress will be given to the agro techniques employed in the cultivation. The results will be communicated to the farmers to adopt the methods.

The experimental work will be done in the Department of Botany, Meerut College, Meerut and partly in I.A.R.I., New Delhi and Pharmacopic Laboratory, Ghaziabad.

SCOPE OF WORK

Uttar Pradesh is one of the most advanced and highly developed states of India. The farmers of this state are very hardworking, but do farming in their own conventional way by sowing Wheat (*Triticum aestivum*) and sarson (*Brassica campestris*). Their income is very low as compared to the labour they put in agriculture.

If they switch over to a change and start cultivating some aromatic ad medicinal plants in their fields, their income can be enhanced several folds. With this view in mind this project has been prepared under the supervision of Dr. D.K. Jain, Reader in the Department of Botany, Meerut College, Meerut.

REFERENCES