

Challenges of Propagating Medicinal Plants[®]

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INTRODUCTION

Over 75% of the world's population relies on plant-based medicines for primary healthcare. Populations using pharmaceutical drugs obtain about 120 prescription drugs with origins from plants (Abelson, 1990). Used mostly by developing countries, 70%–90% of medicinal plants are still being harvested in the wild. If this trend continues, eventually these wild populations will no longer sustain the ever-increasing market demand. Examples of popular wild-harvested plants are *Achillea millefolium* (yarrow) and *Hypericum perforatum* (St. John's wort). Yarrow flowers are used in treating colds, fevers, Crohn's disease, and St. John's wort for patients with mild to moderate depression (Foster and Duke, 2005) These two species can easily be propagated from seed and stem cuttings to avoid over harvesting in the wild.

SUSTAINABLE APPROACH

The production of medicinal plants is still at its infant stage worldwide and is considered a minor crop by growers. The predominant growers of medicinal plants are located in Europe, Canada, Asia, Africa, and the United States. The United States is gaining momentum with increased production of nontraditional crops such as mint and ginseng (Craker et al., 2003). In recent years, the pace of commercialization of traditional medicines has accelerated and caused a sharp increase in demand for plants in the local and world markets (Singh et al., 2007). Eventually, plant sources from the wild will be depleted and more sustainable methods must be implemented. Propagating medicinal species has been on the increase and positive benefits are assured standard quality of compounds and replacement of endangered plant populations (Purohit and Vyas, 2008).

PROPAGATION OF MEDICINAL PLANTS

Propagating medicinal plants is on the rise due to the interest of people who want products of natural origin. The push for alternative medicines and the limiting use of pills is an indication of the current "green movement." The real indicator of this trend is the current buying of high-quality products from local markets. Small-scale cultivation, which requires low economic outputs, can be a response to non-existent or declining wild stocks, generating income, and supplying regional markets. Growing operations are increasingly a focus of medicinal plant propagation and introduction programs intended to encourage the use of traditional remedies for common ailments by making the plant sources more accessible to the public (Shippmann et al., 2002). Two approaches for growers of medicinal plants are field-grown plants and container-grown plants. Field plants are grown for specific compounds utilizing plant parts or whole plants. This is done on a commercial level that may require special equipment for propagation, planting, harvesting, and processing. Container-grown plants are more suitable for retail and wholesale operations. Most plants

can be propagated easily from plugs, seeds and cuttings supplied by commercial propagators, seed companies, and local stock. Many plant species like mints, and other popular perennial species are probably already in production programs, but need to be marketed as medicinal plants.

CHALLENGES TO PROPAGATING MEDICINAL PLANTS

There are many challenges to propagating medicinal plants, one being the limited knowledge of growing and propagating wild species. When propagating from seed there are usually dormancy issues, low or sporadic germination, and longer growing time to maturity. Stratification, the artificial emulation of environmental conditions required for seed germination such as soaking or chilling, can sometimes provide the key to success. In *Panax quinquefolius* (American ginseng), the use of a controlled environment substantially shortens the stratification period required, increases germination rate and seed viability, and enables seed germination any time of year (Canter et al., 2005). Because many of these plants are species and are found in the wild, there is limited plant material for seed and vegetative propagation. Also, many species are very difficult to root from cuttings, requiring hormone treatments.

RECOMMENDATIONS

In order to propagate and grow wild medicinal plant species, growers need to create their own stock plants or seed banks. Many of these species are very difficult to transplant or develop so utilization of wild stock plants is feasible. A special type of cultivation of medicinal plant species is the so-called quasicultivation. This means a sustainable utilization of natural populations by intervention in propagation and harvesting (Yaniv and Bachrach, 2005). One endangered harvested forest plant, *Actaea* (syn. *Cimicifuga*) *racemosa* (black cohosh) is one species currently being studied in the wild for the use of such sustainable intervention to maintain its natural populations. An easier method for obtaining propagation material is contacting native nurseries that grow wild species exclusively. They are set up for long-term growing of these plants and would be a valuable source of knowledge. Experimenting with seeds and cuttings would be another way to learn and become proficient at growing wild plant species. Try propagating easily grown plants like mints. There are many sizes and shapes of plants in the Lamiaceae family that could fit well into the medicinal plant market. Finally, go out and observe the various growing habits and environments of medicinal plants. Some plants could root from natural layering of pendulous branches that can be reproduced in the nursery. Research for this purpose should include determining the suitability for the propagation, cultivation of various plant species under different climates and soils, plant identification, time of planting and method of planting, fertilizer and irrigation requirements, and weed, insect and disease control (Singh et al., 2007).

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