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## Response of fertilization in medicinal and aromatic plants

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### Abstract

In recent years, the demand for medicinal and aromatic plants (MAPs) has grown rapidly because of accelerated local, national and international interests, the latter notably from the pharmaceutical industry. The nutrient level in the soil is one of the most described aspects of agricultural research, also including research into Medicinal and Aromatic plants. Generally, an increased the level of nutrients induces an enhancement of plant biomass, but when the aim of cultivation is different from herbage yield, i.e. when a special plant part like (seeds or roots or or shoot or flowers) is of interest, or when the quality features are particularly important, the outcome of fertilization may be dramatically different. Therefore a good fertilization practice is necessary and forms rates and times of distribution of fertilizers must be accurately planned and managed.

**Keywords:** Response, fertilization, medicinal, aromatic plants

### Introduction

Medicinal plants have been playing an essential role in the development of human culture. As a source of medicine, Medicinal plants have always been at forefront virtually all cultures of civilizations. Medicinal plants are regarded as rich resources of traditional medicines and from these plants many of the modern medicines are produced. For thousands of years medicinal plants have been used to treat health disorders, to add flavor and conserve food and to prevent diseases epidemics. The secondary metabolites produced by the plants are usually responsible for the biological characteristics of plant species used throughout the world. The microbial growth in diverse situations is controlled by plant derived products.

In ordinary agricultural management, the integration and/or enrichment of soil nutrients reserves is one of the most important tools to obtain satisfactory productions. At the same time, however, the use of correct types and quantities of fertilizers was termed necessary (WHO, 2003) [4]. Moreover, nutrient availability in soils is related to several soil characters, both physical and chemical. Soil reaction (pH) and parent material are the major factors moderating the content and availability of mineral elements in the soil. Though, decisions concerning fertilization, actually, involve many consequences. An improper nutrients supply may provoke a number of disadvantages on plants, including lodging, pest attacks, Cycle delay and so on. A few elements may exert a negative effect on the quality features of product (quantity and quality of active compounds) (Radanovic' *et al.* 2004) [3]. Finally, environmental issues linked to fertilization practice are of concern. Indeed, for fertilization efficiency, elements must be in a soluble form, that plants may easily recover from soil, and when soluble elements are not picked up by plants, their excess in soil may generate pollution problems.

### Distribution of medicinal plants

Nearly about 70% of the medicinal plants in India are found in tropical forests in Eastern and western Ghats, Chota Nagpur plateau, Aravalis, Vindhya and the Himalayas. Among the Himalayas, Kashmir Himalayan region is nestled within the Northwestern folds of the recently designated global biodiversity hotspot of the Himalayas (Mittermeier *et al.*, 2005) [2]. The medicinal flora of Kashmir, however, has not been paid due attention and Kashmir alone may have at least two times this number. Some of the most important medicinal plants of Kashmir Himalaya include *Dioscorea deltoidea*, *Rheum Emodi*, *Arnebia benthamii*, *Inula racemosa*, *Datura stramonium* *Aconitum heterophyllum*, *Artemisia spp.*, *Podophyllum hexandrum*, *Juniperus macropoda*, *Hypericum perforatum*, *Hyoscyamus niger*, *Sassurea spp.*, and

*Picrorhiza kurroa* etc., growing in abundance in areas like Yusmarg, PirPanjal, Sonamarg, Gurez, Lolab valley, Gulmarg, Khilamarg, Pahalgam and Tilail valley. The important aromatic plant species include *Caraway* (*Carum cervi*), *Saffron* (*Crocus sativus*), *Siya zira* (*Bunium persicum*), *Garlic* (*Allium sativa*), *Coriander* (*Coriandrum sativum*), *Mint* (*Mentha spp.*), *Fennel* (*Foeniculum vulgare*) and *Hare's foot* (*Trigonella foenum-graecum*). Many of these plants are used in standardized plant extracts.

### Primary nutrient fertilization

As a matter of fact, N is the element that exerts the greatest and most evident effect on crops, in this explaining the farmers' tendency to spread high, and sometimes excessive, doses (Arnon 1992). In this case, the fate of this highly soluble element, and the consequent risks for health and environment, are of major concern (Yadav *et al.* 1997) [5]. Moreover, recommendations for phosphor (P) and potassium (K) dosage of P-K fertilization is also determined by the uptake of plants from soil, which on its turn is dependent upon the expected yields. Hence, soil testing is always to recommend, and the opportunity to add fertilizers should be carefully evaluated based on the goals of farmers.

### Fertilization with other elements

Although decision-making for fertilization usually claims attention only on nitrogen, phosphor and potassium, it is well acknowledged that a far larger number of elements exert some effect on plant life and performance; nevertheless, only some elements (such as B, Mg, Fe, Ca and others) are recognized as "essential", others (such as Cl and Na) are recognized as toxic, but the majority has been largely ignored, simply because their deficiency mostly does not give apparent symptoms (Carrubba and Scalenghe 2012) [1].

### Effects on quality features

In MAPs, besides a deeper knowledge of the effect of each element on biomass yields, an additional emphasis is given on its relevance on qualitative features. In this respect, two alternative viewpoints should be considered: (1) the influence eventually exerted by each element on plant production of secondary metabolites, which would have a significant effect on the market value of the products on sale; and (2) the amount of such elements that might be retrieved in the marketable products by virtue of a plant's capability to selectively recover them from the soil. This second feature could be especially important in relation to the emphasis on ecological safety of herbal products, above all when grown on polluted soils

### Organic fertilization

An increased interest in safety and quality of MAPs is of evidence worldwide, and whatever their final destination of use, MAPs must achieve an increasingly large number of quality issues. In this sense, organic certification is a common requirement, and although from some point of view the real differences between organic and conventional products are still matter of debate, an increasing number of MAPs growers is moving on this crop management (Malik *et al.* 2011). Organic management however requires a special approach to fertilization issues, in that fertility conditions are maintained and increased by means of proper agronomical practices, such as multiannual crop rotation including legumes and other green manure crops, and by the application of few allowed

items. Regulations do not allow the use of synthetically-derived fertilizers, and where external inputs are required, these shall be limited to inputs from organic production.

### Future prospects of medicinal and aromatic plants

In the development of human culture medicinal plants have played an essential role, for example religions and different ceremonies. Among the variety of modern medicines, many of them are produced indirectly from medicinal plants, for example aspirin. Many food crops have medicinal and aromatic effects, for example garlic. Studies the medicinal plants helps to understand plant toxicity and protect human and animals from natural poisons. The medicinal effects of plants are due to secondary metabolite production of the plants. Keeping this in consideration there have been increased waves of interest in the field of research in natural product chemistry. This interest can be due to several factors including therapeutic needs, the remarkable diversity of both chemical structure and biological activities of naturally occurring. Secondary metabolites, the utility of recent bioactive natural compounds as biochemical probes, the development of recent and sensitive techniques to detect biologically active natural products, improved techniques to isolate, purify, and structurally characterize these active constituents, and advances in work out the demand for supply of complex natural products. Medicinal and aromatic plants are resources of new drugs and many of the modern medicines are produced indirectly from plants.

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