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EFFECT OF NITROGEN SOURCES AND LEVELS AND PRUNING DATE ON *JASMINUM GRANDIFLORUM*, L.

By

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Thesis

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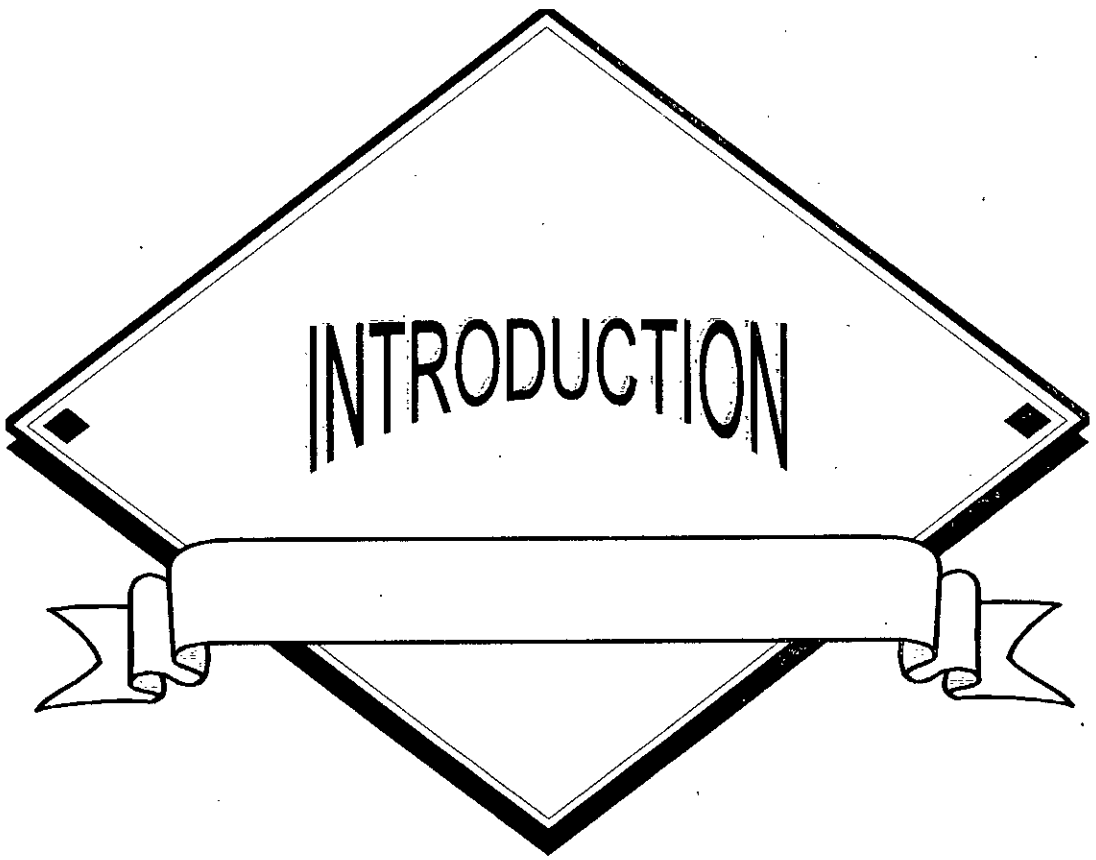
INTRODUCTION

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Jasmine "*Jasminum grandiflorum,* L" is cultivated in Egypt on a large scale for the extraction of its concrete and absolute oil products for exportation to many countries, and thus it can be considered as a valuable source of hard currency. Besides, the plants are grown as shrubs and climbers and used in landscape. The genus *Jasminum* belongs to Family Oleaceae, and is native of tropical and subtropical regions and was introduced to Egypt in the mid-sixteenth century **(Seemanthini and Muthuswami, 1989)**.

The Spanish jasmine or Catalonian jasmine "*Jasminum grandiflorum,L*" is native of northern Iran, Afghanistan, Kashmir and North-West Himalayas and has been widely introduced and commercially cultivated in many countries, principally around the Mediterranean. Basically adapted to a mild-temperate climate, local cultivars are often drought and frost resistant. Plant requires an above average day and below average night temperature for maximum floral initiation **(Seemanthini and Muthuswami, 1989)**. The name jasmine is of Arabic origin and is believed to have been derived from yasmin or yasmyn.

Jasmines have been cultivated for various purposes since very early times. For the past many centuries, they have adorned the gardens of central Asia, Afghanistan, Iran, Nepal and many other tropical and sub-tropical countries. Flower buds are used for making garlands, bouquets, used for decorating hair of women and for religious offerings. Flowers were also used for the production of perfumed hair oils and attars. The jasmine oil is regarded as unique as it blends well with other floral extracts and it is highly valued throughout the world for producing high grade perfumes.

The world famous jasmine oil is extracted from *Jasminum grandiflorum* flowers, the oil is also used in soap and cosmetic industries,

the oil of Arabian jasmine was used in China for flavoring tea, it is also used for perfuming mouth washes and dentifrices.

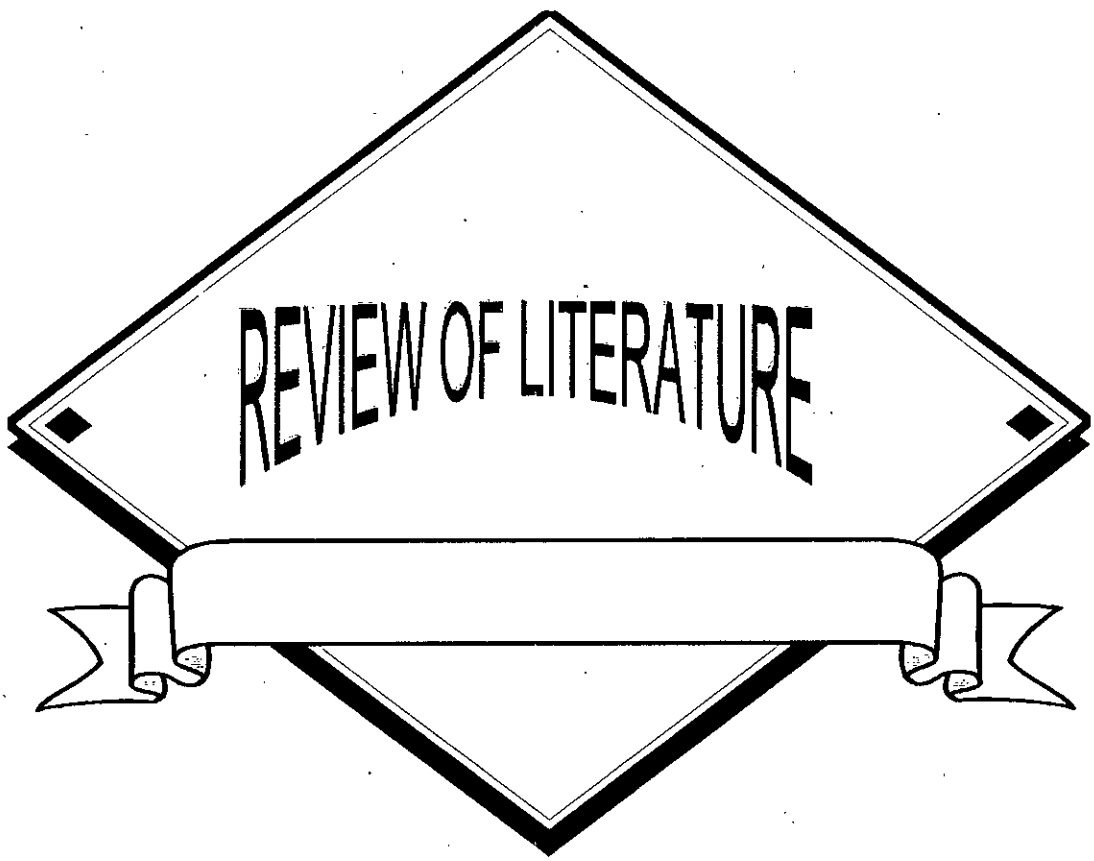
Alcoholic washings of concrete are used in handkerchief perfumes. The odor of jasmine flowers cannot be imitated by any known synthetic aromatic chemical or natural isolates, thus giving it an unique status in the perfume world.

Since the optimum N-fertilization levels and sources have not yet been studied for jasmine under Kafr El-Sheikh soil conditions, there was a necessary for such study. However, using different nitrogenous sources to fertilize such plant as urea, ammonium sulphate and ammonium nitrate is in use in Egypt.

Thus, the evaluation of these fertilizers to choose the best level and source of them with regard to their effect on the growth, flowers yield, concrete and absolute oil yields and chemical composition of plants is of a paramount importance.

Also, the effect of different pruning dates on the growth, flowers yield, concrete and absolute oil yields of such plant is a quite rare in Egypt.

It is hoped that this study may help in improving cultivation of this plant in Delta and especially El-Gharbia Governorate as the principal area of production of such plant in Egypt where it is cultivated with about 1000 fed. of jasmine. Besides it is hoped to spread cultivation of such plant in the neighboring governorates as Kafr El-Sheikh.


REVIEW OF LITERATURE

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First Experiment

Effect of Nitrogen Sources and Levels

The requirement for nitrogen continues throughout plant development to maintain growth, as nitrogen is a constituent of both structural and non-structural components of plant cells. Plant can take up N as either the nitrate or ammonium ion. Nitrogen encouraged the plant growth through its stimulative effect on the meristematic activity of tissues. These effects differ according to the nitrogen carrier. The pattern of nitrogen release varied according to the type of nitrogen source. Urea-N when present was released first, followed by ammonium-N and nitrate-N, the response of plant growth to the nitrogen fertilizers varied according to the source of nitrogen. This might be attributed to the volatilization of nitrogen **(Overrein and Moe, 1967)** and ammonium or nitrate **(Cooke, 1962)**. The stimulative effect of ammonia on plant growth is attributed to the effect of ammonium on the plant photosynthetic apparatus **(Lopez-Contareo *et al.*, 1994)** and or due to the speedily release of urea to deeper layers of soil **(Gott, 1979)**.

Many plants can effectively utilize $NH4^+$ and some species produced good utilization of a mixed supply of No^-_3/NH^+_4 or No^-_3 alone **(Conover and Poole, 1986)**. Nitrate –N is utilized readily by plants, but also leashes easily, whereas ammonium-N can be retained by the cation exchange capacity of the medium until nitrified **(Street and Sheat, 1958)**.

The form of N-nutrition may also exert a considerable influence on the mineral composition of plants **(Abou-Hadid *et al.*, 1993)**. According to **Cox and Reisen Tauer (1973)** ammonium increases anion uptake, whereas nitrate increases cation concentration in wheat plants. Moreover,