

Abstract

ABSTRACT

STUDIES ON VARIABILITY, EFFECT OF SPACING, ORGANIC MANURES AND BIOINOCULANTS ON *Aloe vera* L.

By

G. ALAGUKANNAN

Degree : **Doctor of Philosophy in Horticulture**
Supervisor : **Dr. S. Ganesh, Ph.D.,**
Professor of Horticulture
Faculty of Agriculture and Animal Husbandry,
Gandhigram Rural Institute (Deemed University),
Gandhigram – 624 302, Tamil Nadu, India.

2011

Field experiments were conducted at Gandhigram Rural Institute (Deemed University), Dindigul district, India to study the existing variability in *Aloe vera* L. (Phase- I) and to study the effect of different spacing levels and forms of manures long with bioinoculants (Phase- II) during Aug, 2005 to Jan, 2009. Phase- I experiment was laid out in Randomized Block Design with twenty one accessions and phase- II experiment was laid out in split-plot design keeping the spacing levels as main plot treatments and forms of manures along with bioinoculants as sub-plot treatments.

Striking variation was noticed among the twenty one accessions evaluated in terms of qualitative attributes, growth, yield and quality parameters apart from the drought tolerance related characters. High heritability coupled with high genetic advance was estimated for leaf volume, number of leaves plant⁻¹, leaf yield plant⁻¹, plant spread, leaf width, leaf weight and plant height and these characters could be improved upon by exercising selection.

Leaf weight, leaf length, plant height, number of leaves plant⁻¹, leaf width had significant positive correlation coefficients and positive direct effects on leaf yield plant⁻¹ which forms reliable indices for selection of genotypes for higher yield. The twenty one *Aloe vera* accessions subjected to D² analysis fit into five groups.

The accession AV₁₆ collected from Thiruvannamalai district of Tamilnadu found to be the best for its leaf yield, gel yield and quality besides drought tolerant abilities. Hence, it can be directly utilized as a cultivar after conducting Multi Location Trials (MLT) or in breeding programmes for the development of promising cultivars suitable to meet the demand of cosmetics industry.

The accession AV₁₇ collected from Trichy district of Tamilnadu found to be the best for latex yield and barbaloin content and it could be better utilized for medical industry. The accessions AV₁₆ and AV₇ (collected from Gandhigram) found to be more drought tolerant.

Planting of *Aloe vera* suckers at 75x75 cm spacing and application of vermicompost @ 2.5 t ha⁻¹ + *Azospirillum* and Phosphobacteria @ 2 kg each ha⁻¹ (M₂S₄) resulted in better growth characters, physiological parameters, yield attributes, yield and quality. Hence, it is recommended as the best agronomic practice for higher productivity and quality of gel and thereby higher net returns per unit area in *Aloe vera*.