

EFFECTS OF SOIL STERILIZATION UPON DISEASE  
AND FERTILIZER RESPONSE OF GLADIOLUS

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Fertilizer requirements of gladiolus have been shown to vary considerably from one area to another, depending upon the soil type and climate encountered. Experimental work conducted at the Horticultural Crops Research Station, Castle Hayne, North Carolina, on gladiolus fertilization has indicated that only relatively small amounts of fertilizers are required.

With the production of relatively disease-free corms from hot-water treated cormels, it is imperative that these corms be planted and grown in "clean" or sterilized soil. A field experiment was recently conducted at the Horticultural Crops Research Station to determine the effects of soil fumigation and various fertility treatments on growth, yield and disease development in gladiolus.

The experiment was conducted on Onslow fine sand. Number 3 Picardy corms used in these experiments were obtained from hot-water treated cormels grown the previous year in sterilized soil. A split plot design was used wherein sixteen soil fertility treatments were compared on fumigated and non-fumigated soil. Half of the plots were fumigated with methyl bromide (2 lbs./100 sq.ft.) two weeks before planting and the other half served as non-fumigated checks.

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Emergence was not affected by the different fertility treatments. A delay in emergence resulted when corms were planted in fumigated soil but differences in the number of spikes cut the first week due to soil treatment were not significant

The number of flower spikes and corms produced were not affected by the different fertility or soil treatments, but the length and weight of spikes and weight of corms from fumigated plots were significantly greater than those from non-fumigated plots. There was an increase in weight of spikes and corms with each increment of fertilizer application up to 2,000 pounds of 5-10-10 on fumigated soil, but there was no increase in weights from non-fumigated soil. The greatest weight of spikes and corms was obtained from 500 pounds of 5-10-10 per acre broadcast plus 200 pounds of 14-0-14 per acre applied at emergence and at the 5 leaf stage.

The ability of gladiolus roots to absorb plant nutrients is apparently affected to a great extent by soil-borne pathogenic fungi, nematodes or mechanically induced root injury. This pathogenic impairment is greatly reduced through soil sterilization and the use of corms free of those pathogens.

Results of this experiment indicate that planting healthy corms in sterilized soil will enable the plants to utilize heavier rates of fertilization, upgrade the quality of the flower spikes because of increased weight and length, and produce heavier and healthier corms.