The use of bio-inputs - Bioquirama - to improve production and profitability in the cultivation of chrysanthemums in eastern Antioquia

INTRODUCTION

One of the biggest concerns in agriculture is the impact on health of producers and consumers and the environment because of improper use of agrochemicals. The decision on the type of pesticide to be used is based on the criteria used by the responsible professional, the pressure of commercial houses pesticides, the cost of products and previous experience of producers. For this reason the implementation of integrated pest management (IPM) allows mitigation of adverse effects.

The bio-natural products are used in agriculture to control pests and diseases, improving nutrition of crops, soil conditioning. In the case of cut flowers, the bioinputs are part of IPM programs and are an efficient alternative for solving phytosanitary and nutritional problems.

BIOQUIRAMA is a Colombian company dedicated to the development, production and marketing of bio-ecological inputs for horticultural and forestry sub-sectors of the country with the purpose of contributing to environmental and technical sustainability supported by innovative technologies. The practical use of some bio-inputs such as mycorrhizal fungi, biological soil inoculants and some antagonistic fungi strategies fit within biological management of soil fertility, aimed at obtaining sustainable productivity. These are ESTs, and displayed as one of the most promising practices and innovative for agricultural and forestry sectors biological basis.

This research was developed with the purpose of evaluating the effect of the interaction of mycorrhizae with biological bioinoculants and fungi Trichoderma harzianum and Paecilomyces lilacinus and its effect on the productivity of stems in the cultivation of chrysanthemums.

METHODOLOGY

The trial was conducted in the Gardens El Portal culture, located in the municipality of La Ceja (Antioquia) in chrysanthemum varieties: Atlantis, Polaris and Handsome.

They use an experiment in a randomized complete block, where a total of 18 beds were evaluated (each bed has an area of 45 m 2), of which nine were treated with bioinputs and the other nine were for witnesses are handled conventionally. Due to the presence of high populations of nematodes was applied drench potassium manganate in a dose of 500 grams. in 120 liters of water per bed before performing preplant process. Table 1 shows the products and doses used are presented; These products were applied evenly on the floor of the bed at the stage of sowing. They then joined with the help of a gambia at a depth of 20 cm, the Prowl herbicide was applied and proceeded to planting. The mycorrhizal inoculum used is made with sterile soil roots, mycelium and spores of the fungus Glomus fasciculatum, Scutellospora heterogama, Glomus mosseae, Glomus manihotis, rough Acaulospora and Colombian Entrophospora

Bioinsumos evaluated in the experiment.

Product	Dose / bed
Micorriza (MVA)	7.5 Kgs.
Trichoderma harzianum	75 grs.
Paecilomyces lilacinus	75 grs.
Soil Conditioner	9 grs.

Use of bio-process in chrysanthemums.


Micorrize Trichoderma and Paecilomyces


Product distribution in the soil


Incorporation of products


then seeding process

Drench applications

The soil conditioner is applied weekly doses of 9 grams per bed for the first seven weeks. Seven days 75 grams of Paecilomyces was applied in 120 liters of water. Then continuously monitor the vegetative development of the varieties tested to production was performed. In order to perform an initial monitoring nematodes in the soil at week 825; and at week 831 new check both soil and roots was performed.

RESULTS

Tables 1 and 2 populations of nematodes is prevalent before and after treatments. It is noted as in the beginning were prevalent nematodes Pratylenchus and Paratylenchus.

Table 1. Initial sampling of plant parasitic nematodes in beds pompom - Week 825 –

Bed	**Type of sample**	**Fitoparásitos**				**Others**
		Meloidogyne	Pratylenchus	Paratylenchus	Tylenchus	
178	Floor	0	25	717	0	92
180	Floor	0	58	350	0	92
182	Floor	0	17	375	0	92
184	Floor	0	83	75	0	42
Averages		0	45.7	379.2	0	79.5

Table 2. Final nematode sampling crisantemo- Week 831

Bed	**Type of sample**	**Fitoparásit**				**Otros**
		Meloidogy	Pratylenchus	Paratylenchus	Tylenchus	
160 Witness	Floor	0	316	0	0	775
162 Witness	Floor	8	675	25	0	925
162 Witness	Root	0	3225	8	0	850
178 Bioinputs	Floor	0	42	767	0	358
180 Bioinputs	Floor	0	167	525	8	192
182 Bioinputs	Floor	0	67	667	0	333

184 Bioinputs	Floor	0	33	158	8	192
184 Bioinputs	Root	0	3375	0	0	94

Other: saprobes, predators, micófagos or bacteriophages.

Figure 2 shows the results related to production are shown. In the case of Atlantis, Polaris and Handsome varieties treated with bio-beds they had increased production compared to control plants receiving regular treatment of the plantation. Increases in production for each variety were respectively 12.4%, 13.8% and 22.4%

Soil microorganisms carry out a series of activities that can improve the availability of certain mineral nutrients for plants. This implies the possibility of synergistic interactions with mycorrhiza as to promote plant growth, as evidenced by the results shown in relation to the production of bouquets. In the case of mycorrhizae, seen as an organ of absorption and translocation of water and nutrients, it is one of the most outstanding adaptations of roots to function properly in the field edáfico.

One explanation for the increase in production by the use of bio-rational products is positive interaction between mycorrhizae and the presence of amino acids, vitamins and plant growth regulators (PGR) present in the biological inoculant. According to Barea et al. (1992) These synergistic effects appear to be more associated with the production of hormones and other metabolites.

With regard to the interactions between mycorrhizal fungi and plant protection employees - Trichoderma and Paecilomyces case - some research (. Calvet et al, 1993) have shown a significant increase in the mycelial growth of mycorrhizae Glomus mosseae; this may be happening in the present assay relative to production improvement when compared with control treatments in the three varieties of chrysanthemum evaluated.

Barea, J. M., R. and C. Azcon Azcon. 1992. Vesicular arbuscular fungi in Nitogen micorrhyzal - fixing sistems. In: Methods in microbiology. Vol 24, pp. 391-412.

Calvet, C., C. Perea and J.M. Barea. 1993. Growth response of marigold (erecta mats) to inoculation With Glomus mosseae, Trichoderma and Pythium ultimatum aureoviride in a peat perlite mixture. Plant and Soil, 148: 1 to 16.

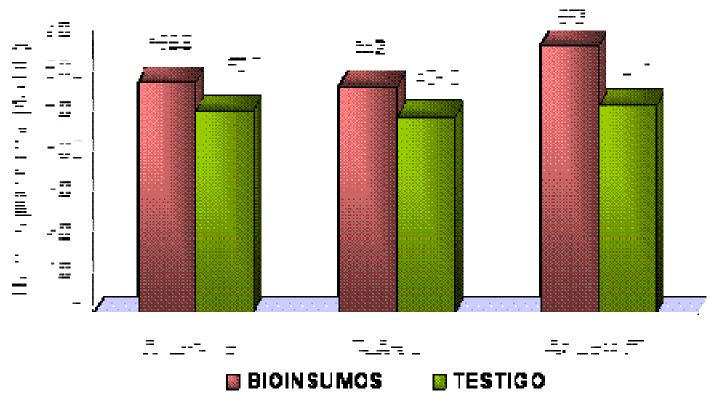

Figure 2. Production of bouquets bed in three varieties of chrysanthemum with the use of bio-inputs and witnesses on conventional management.

Regarding the economic aspects in Figure 3 sales values of the branches are presented, considering that each branch is composed of seven stems, where differences between treatments with bio-inputs and the control of commercial driving are respectively US64. 6 US70.7 and US135.6 for Atlantis, Polaris and Handsome varieties. These results show that the use of these products as well as being environmentally friendly environmentally sustainable and economically therefore can be incorporated into a program of integrated crop management chrysanthemum.

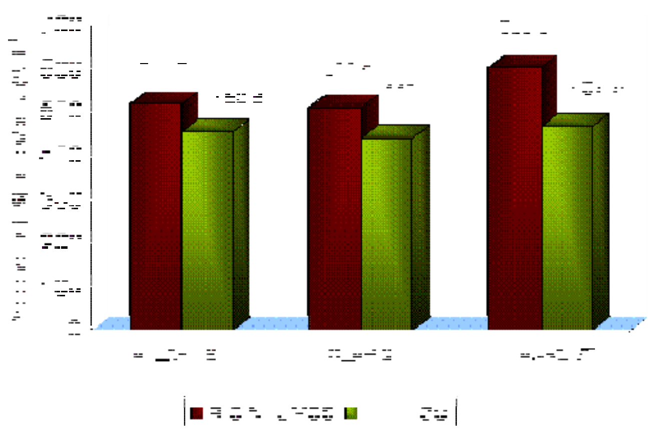

Figure 3. sale price obtained bouquets bed (45 m2) with the use of bio-inputs and the control (conventional commercial chrysanthemum crop management.

CONCLUSIONS

The use of bio-BIOQUIRAMA showed increases in production 12.4%, 13.8% and 22.4% in the varieties of chrysanthemum Atlantis, Polaris and Handsome compared to conventional treatments.

The use of bio-BIOQUIRAMA showed an increase in revenues from the sale of branches / bed: US64.6, and US135.6 US70.7 for Atlantis, Polaris and Handsome varieties respectively when compared with conventional management culture.