Control of flower infection resulting in the longevity of flowers in Camellia by spray application of Promot®

Camellia is a slow flowering plant and often it takes longer period from button stage to flower opening. During this period flowers are subjected to *Botrytis* and *Ciborinia* infections and withers off even before opening and do not last at all. A trial was conducted to see Promot® application could help the flower stand better by controlling *Botrytis* and *Ciborinia* infections.

Materials and Methods:
Actively flowering Camellia (*Camellia japonica* 'Nuccios Bellarosa') in five-gallon container showing uniform flower buttons were selected. The plants were arranged randomly and Promot® was applied at the rate of 3 quarts /100 gallon by a backpack sprayer targeting the flowers. There were five replicate plants for the treatment and another five plants were sprayed with deionized water as respective controls for comparison. Three application of the product was made at 15-day intervals and flower stand was evaluated every two days till a consistent difference was observed between the treatments. During the trial plants were subjected to sprinkler irrigation to promote the growth of both the pathogens and the biocontrol agent Trichoderma present in Promot.

Results and Discussion:
It is interesting to note that Promot® sprayed plants showed better flower stand compared to unsprayed plants (Table 1 and Fig.1). In unsprayed plants the flower started turning brown due to pathogen infections and withered off prematurely. It was also observed that at any given time the number of opened flower are more in Promot® sprayed plants and appeared fresh for a longer time. These results show that Trichoderma populations present in Promot colonized the flower surface inhibiting the infections caused by the pathogens such as *Botrytis* and Ciborinia. Botrytis is common pathogen present on many types of flowers resulting in premature fall of flowers and the reduction of flower quality. It was proved *in vitro* that Trichoderma was effective against Botrytis.

Conclusions:
Flower stand and longevity of many flowers is important, as many florists wanted the flowers to last longer and appear healthy. Chemical fungicides are strongly discouraged to apply on salable flowers they cause health hazards to both applicator and the end customer. Under these conditions application of Promot is a potential alternative for the control of flower infections on many varieties. Also, Promot as a living alternative provides longer protection by its colonization of infection points prior to the pathogens on the floral surface and keeping the infections under control.

Recommendation: Most of the Trichoderma are appliqued as soil treatment or foliar application material for root rot or foliar disease control. Based on the results of this trial it s important to consider another avenue for marketing Promot as floral infection control agent in floriculture industry. It is important that marketing department should contact floricultural nurseries around and offer product services advising them the use of Promot for better flower stand, longevity and non toxic way of control of floral pathogens.

Table 1. Control of Botrytis and Ciborinia infections on Camellia flowers by the application of Promot®.

Treatment	Intervals[x]/ infected flowers (%) [x]					
	1/28/04	1/30/04	2/2/04	2/4/04	2/9/04	Mean
Control	8.6 a	10.8 a	4.0 a	13.0 a	10.6 a	9.4
Promot®	5.4 a	4.2 b	0.0 b	0.0 b	8.2 a	3.5

[x] Treatments means followed by the same letter did not differ significantly ($P<0.05$) as determined by Fisher's pairwise comparisons.

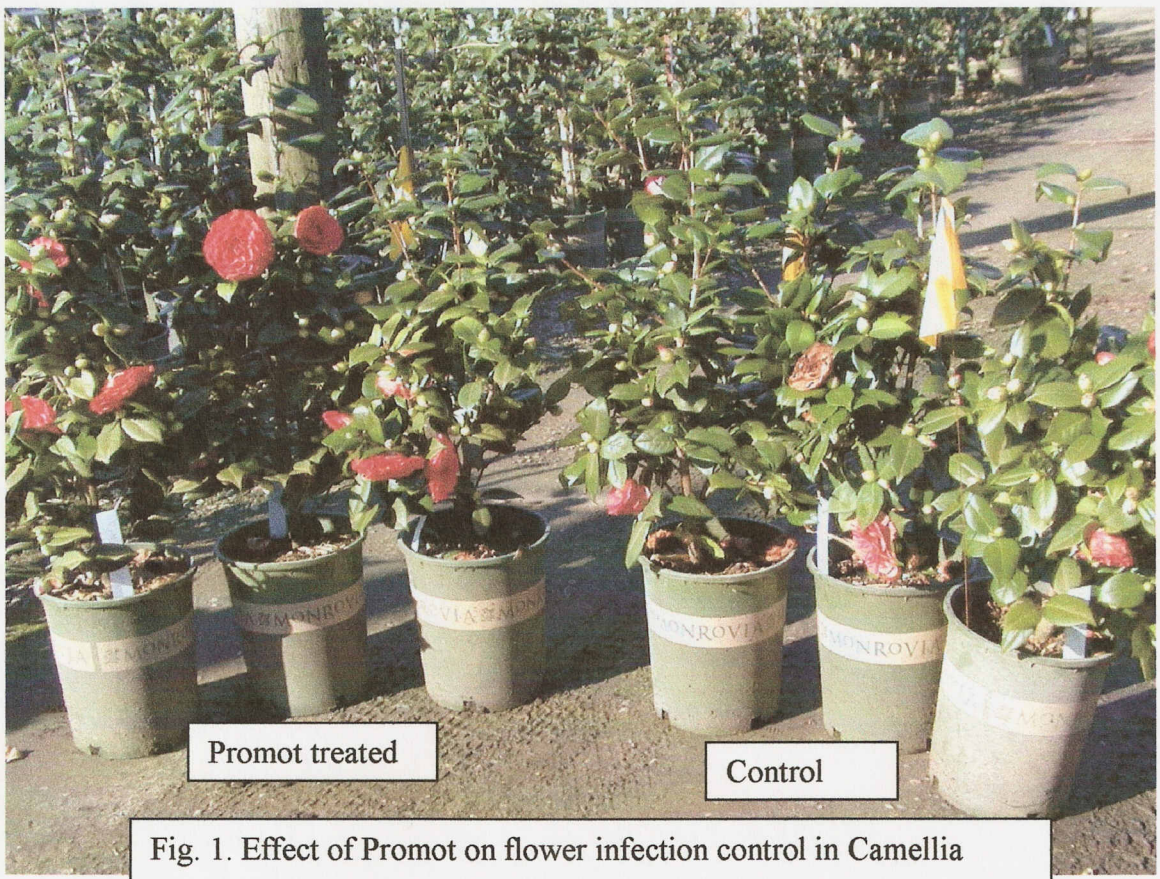

Fig. 1. Effect of Promot on flower infection control in Camellia

Please note the flowers in untreated plants are a kind of off color and drying compared to red color and fresh ones in Promot treated plants.