FUMIGATION OF CUT FLOWERS WITH REDUCED DOSAGE OF METHYL BROMIDE.

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Cut flowers are a major agricultural export product from Israel. About 1.5 billion flowers at a total value of U.S. $ 200 million are exported from Israel each year. The flowers must be completely clean from quarantine pests. Today, the most effective method to control quarantine pests is fumigation by methyl bromide. In Israel, this treatment is successfully conducted for many years against the leaf miner *Lyriomiza huidobrensis* (Blanchard) on gypsophila. The recommended dosage is 40 g/m^3 for three hours. This treatment is effective also against other quarantine pests.

Recently, larger numbers of flower species are exported as compared to only 3-4 species in the past. This resulted in requirements for new standards for quarantine treatments, as some of the species may suffer damage by the fumigation treatment applied at a rate recommended for gypsophila. On the other hand, different sensitivity of insects to fumigants is known. To add to the complexity of the situation, the recent status of methyl bromide which calls for its reduced use, must be considered. Therefore, there is an urgent need for new methyl bromide standards which would be specific to pest and flower sensitivity and which would allow reduced treatment rates.

For this purpose the activity of methyl bromide on the main quarantine pests was tested in pilot and field experiments. The test pests were the Western flower thrips *Frankliniella occidentalis* (Pergande), the Tobacco white fly *Bemisia tabaci* (Gennadius) and the snail *Xeropicta vestalis joppensis* (Schmidt). The thrips and the white fly were reared in the laboratory, the snails were collected from the field. The flowers were infested before treatment. The mortality tests were performed 3, 24 and 48 hours after fumigation for the white fly, thrips and snail, respectively.

In addition, the effect of methyl bromide fumigation on a broad spectrum of cut flowers was examined. The test flowers were: anigozantos, asparagus, white aster, blue aster, dianthus, gerbera, gypsophila, kochia, limonium, phlox, pittosporum, rosa, ruscus, solidago, sunflower. Phytotoxicity was tested during a week after treatment under controlled temperature-humidity conditions.

The results indicate that *B. tabaci* the most sensitive among the tested quarantine pests. A concentration of 15 g/m^3 for 2 hours was enough to obtain the total mortality of this insect. No phytotoxicity effect of this treatment on any kind of tested flowers was recorded 7 days after fumigation .

In the case of *F. occidentalis* and *X. vestalis joppensis* a higher concentration of 20 g/m^3 and exposure time of 2 hours were needed to attain 100% kill of these pests. As a rule, all tested flowers, except sunflower, were without any signs of phytotoxicity damage. At a higher concentrations of 25-30 g/m^3 and exposure time of 2-2.5 hours

rosa and pittosporum were tolerant to methyl bromide fumigation, whereas phlox and solidago were with signs of low pytotoxicity already 4-5 days after treatment.

To conclude, these results reveal that the differential approach to cut flowers treatment enables to reduce methyl bromide concentration 2-2.5 times as compared with current recommended doses.