GLADIOLUS PRODUCTION WITH METHYL BROMIDE ALTERNATIVES PACIFIC AREA-WIDE PROGRAM FOR MBA

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Cut flower and ornamental bulb industries rely heavily on a methyl bromide/chloropicrin (MB/Pic) mixture as a key pest management tool. The loss of MB will seriously affect the cut flower and bulb industry, and, in the future, will require growers to use alternative fumigants. Therefore, efficacy of shank and drip-applied alternative fumigants (normal and reduced label rates) under high barrier film (virtually impermeable film, VIF) to control soil-borne pathogens and to produce a Gladiolus bulb crop was tested in Santa Maria relative to the standard MB/Pic shank fumigation at 350 lb/acre and an untreated soil. The primary goal of this project is to demonstrate alternative fumigation systems at on-farm trials to facilitate the implementation of alternative pest management strategies by the California cut flower and ornamental bulb industry.

Materials and Methods

Two trials were initiated on a commercial Gladiolus farm near Santa Maria, CA, on the central coast. The drip trial consisted of 71" beds 150 ft long. Five drip tapes were used to deliver the fumigants in 1.5" of water. Ten Gladiolus varieties were planted in each plot (15 feet each) and the treatments were replicated 4 times. The treatments consisted of methyl bromide/chloropicrin (67/33) 200 lb/acre, InLine 200 lb/acre followed by Kpam 37 gallons/acre, Basamid 200 lb/acre followed by water, Basamid 200 lb/acre followed by chloropicrin 100 lb/acre, PicChlor 60 EC 200 lb/acre followed by Kpam 37 gallons/acre, Midas (33/67) 150 lb/acre, Chloropicrin 100 lb/acre followed by Paladin 450 lb/acre, Kpam 37 gallons/acre, and the untreated control. All plots were applied under VIF except for the methyl bromide/chloropicrin treatment which was applied under standard polyethylene film.

The shank trial consisted of plots 300 feet long and 22 feet wide. Again, 10 Gladiolus varieties were planted in each plot (30 feet each) and only the center row was harvested for yield evaluations. The treatments consisted of methyl bromide/chloropicrin (50/50) 350 lb/acre, Telone C35 200 lb/acre, PicChlor 60 200 lb/acre, Paladin/chloropicrin (83/17) 600 lb/acre Midas (50/50) 150 lb/acre and Midas (50/50) 100 lb/acre and the untreated control. Each plot was covered with VIF excerpt for the methyl bromide/chloropicrin treatment which was covered with standard polyethylene film.

Results

All the chemical treatments reduced the pathogen populations in both the drip and the shank trial compared to the untreated controls except for Telone C35 which did not perform well for control of Fusarium oxysporum in the shank trial (Fig 1-4). The chemicals seemed to better reduce populations in the shank trial compared to the drip trial. Most of the chemicals controlled pathogens as well as the standard methyl bromide/chloropicrin treatment. Bulb yield was improved with all chemicals in both trial compared to the untreated controls (Fig. 5-6). Bulb yield from the alternative treatments was generally comparable to the standard methyl bromide/chloropicrin treatment. Overall, pathogen and yield seemed to be slightly better in the shank treatments compared to the drip treatments. From these results, it appears that a successful Gladiolus bulb crop can be grown with these alternative treatments.

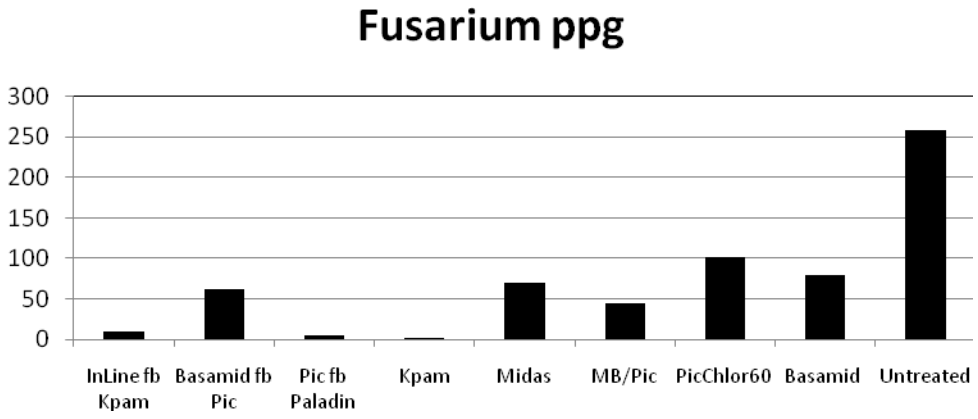

Figure 1. Populations of *Fusarium oxysporum* from a drip applied fumigant trial.

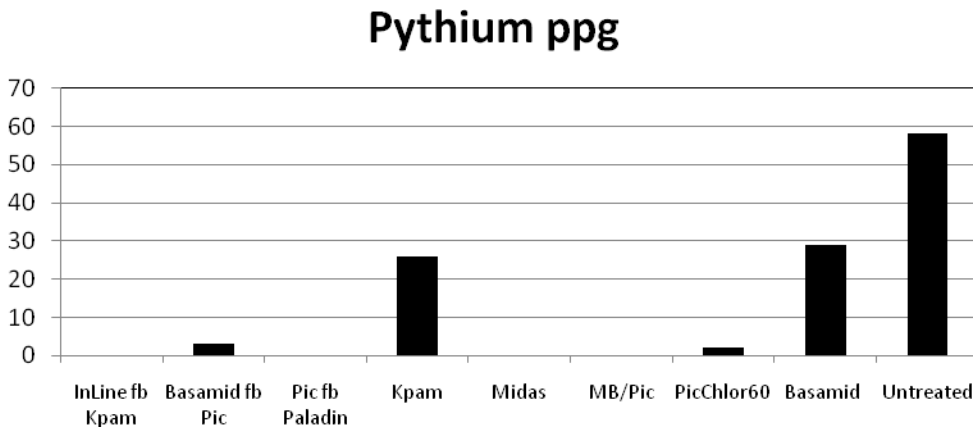

Figure 2. Populations of *Pythium spp.* from a drip applied fumigant trial.

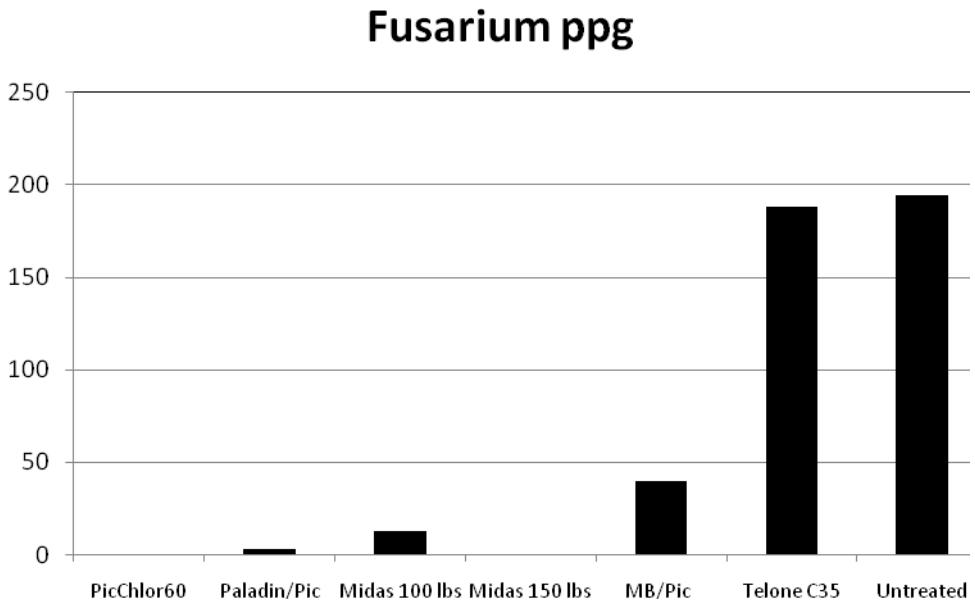

Figure 3. Populations of *Fusarium oxysporum* from a shank applied fumigant trial.

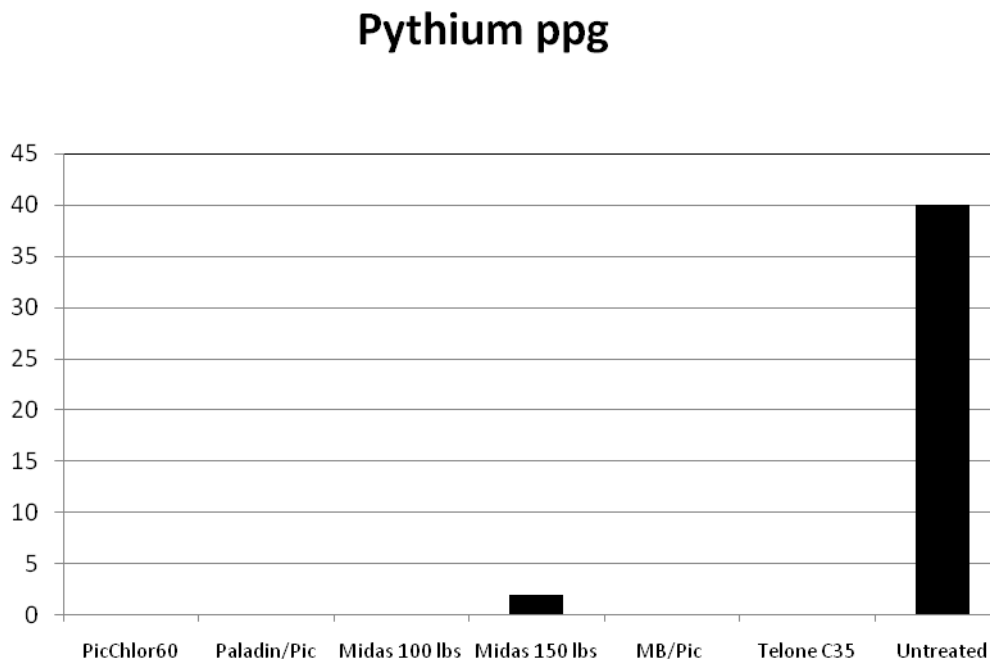

Figure 4. Populations of *Pythium spp.* from a shank applied fumigant trial.

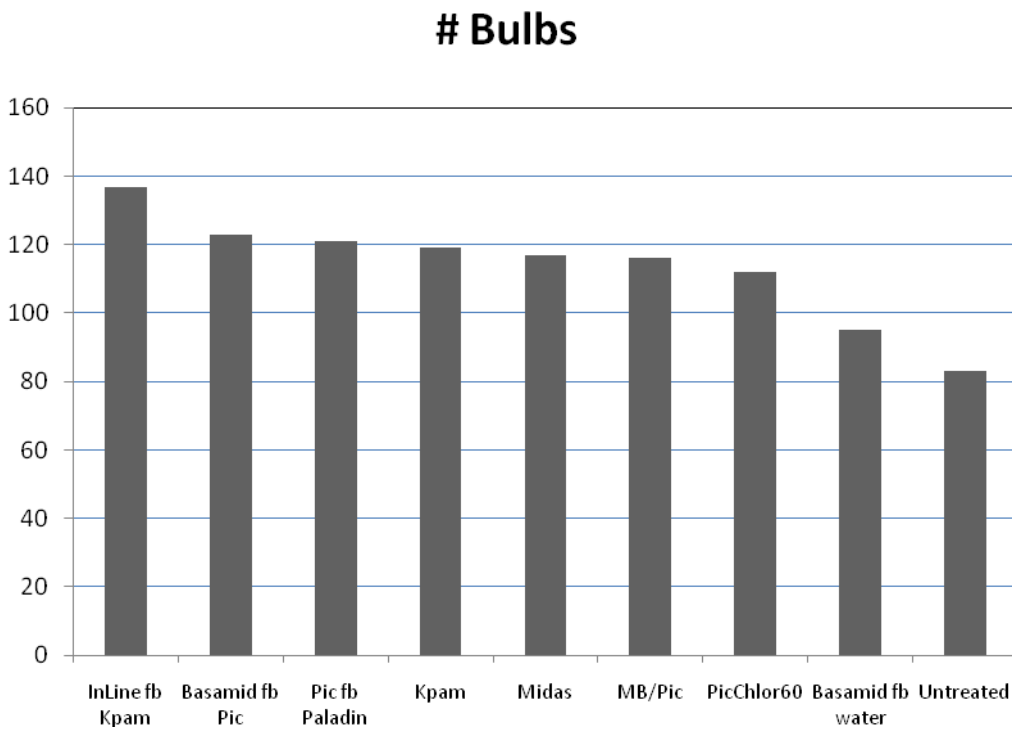

Figure 5. Number of Gladiolus bulbs from 15 feet of row from a drip applied fumigant trial. Each bar represents the mean of 10 varieties.

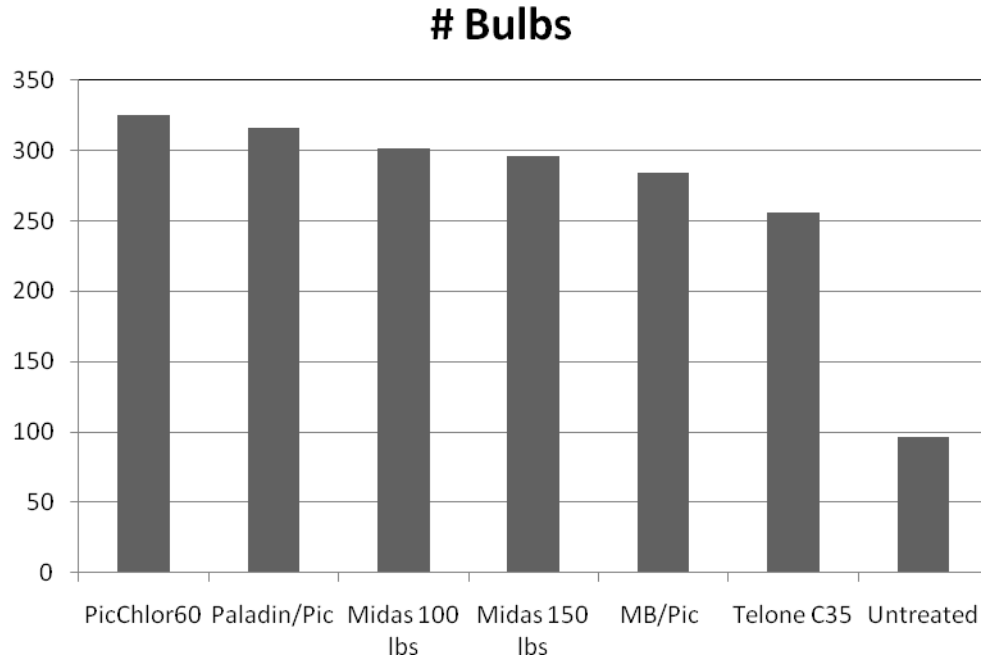

Figure 6. Number of Gladiolus bulbs from 30 feet of row from a shank applied fumigant trial. Each bar represents the mean of 10 varieties.