ABSTRACT

DETERMINATION OF TOLERANCE OF NAGAMI KUMQUAT BUDWOODS TO COBALT-60 IRRADIATIONAND IDENTIFICATION OF DIFFERENT GENOTYPES WITH RAPD MARKERS

Cennet KARA

M.Sc. Thesis, Department of Horticulture

Supervisor: Assoc. Prof. Dr. Zeynel DALKILIÇ

2014, 47 pages

Nagami kamquat (Fortunella margarita L.) and trifoliate orange (Poncirus trifoliata (L.) Raf.) were used as scion and rootstock, respectively, in this study. Seedlings have been grown in four different groups of potting mixtures such as control, mycorrhiza, vermicompost, and mycorrhiza+vermicompost since December 2012. While the highest increase in seedling length was in control group, that of in seedling diameter was in mycorrhiza group and that of in side-branches was in vermicompost in July 2013. Nagami kam quat sciowoods were treated with 0, 15, 30, 45, 60 Gy ^{60}Co gamma irradiation in July 2013. Irradiated budwoods were T-budded on two-year-old trifoliate orange rootstocks grown in high plastic tunnel. Total of 248 budded plants, only 48 were bud-taken. Thus, M_1V_1 plants were obtained. However, only 30 plants survived until fruit set time. Bud take ratio in plants grown in high plastic tunnel was between 18.8 60% Gy and 43.8 15% Gy 21 days after budding. The mophological measurement were ranged as follows: shoot length 20.98 cm 45 Gy-39.02 cm 0 Gy, diameter 4.78 cm 30 and 45 Gy-5.72 cm 60 Gy, leaf number 26 no. 30 and 45 Gy-47 no. 0 Gy, fruit number 2.40 no. 60 Gy-5.50 no. 45 Gy and diameter 16.20 mm 60 Gy-18.99 mm 0 Gy in approximately 16 months after budding. Chlorophyll contents were changed in the upper and lower side of the leaf as 0.6254 30 Gy-0.6735 0 Gy and 0.4003 30 Gy-0.4224 0 Gy, respectively. Plant no: 12 (S-26-45) was determined as different from other plants using RAPD primers. PM2, PM3, PM4, PM5, PM7, and PM8 primers gave four polymorphic and 14 total bands proving the difference. It was observed that Nagami kamquat scionwood resist to 60 Gy ^{60}Co gamma irradiation. Therefore, it is advisible to apply higher doses of ^{60}Co.

Key words: Fortunella margarita, Poncirus trifoliata, ^{60}Co irradiation, nursery characteristics, RAPD markers, PCR