

Chemical Control (60 ~ 62)

E-60 Pear diseases are effectively control by forecasting programs on Pear Scab and Pear Rust. Y.S. Park¹, D.S. Son¹, H.S. Seo¹, E.W. Park², Y.S. Cho¹, Y.K. Han³ ¹Naju Pear Experiment Station, National Horticultural Research Institute, RDA, suwon 440-310, Korea, ²School of Agriculture Biotechnology, Seoul National Univesity, Seoul 151-741, Korea ³Business Incubator College of Agriculture & Life Sciences, Seoul National University, Suwon 441-744, Korea

In order to control of pear diseases, numbers of fungicidal spraying frequency in a orchard were 10.4 times in the average. Allowable limit of diseased damage was 3.0%. The cost of fungicide required for 1 time spraying was 6,351 won per 10a. One % loss of diseased fruits was estimated to 39,397 won per 10a. Varieties susceptible to pear scab (*Venturia nashicola*) were Whang-gum, Shing-go, Man-sam-gil, and Jang-sib-rang, and resistant varieties were Chu-hwang and Won-huang. When risk values indicated by forecasting programs on pear scab (PearScab) and pear rust (PearRust) were reached to 2 and higher than 1 respectively, sprays of curative fungicides after 3-4 days were effective for disease control.

E-61 Degree of copper spray injury on satsuma mandarin(*Citrus unshiu*) according to growth stage and spray season, and by tank mixing with paraffin oil. Jae-Wook Hyun, Dong-Hwan Kim, Kwang-Sik Kim¹, Hyeog-Mo Kwon, and Han-Cheol Lim Subtropical Environment Division, National Institute of Subtropical Agriculture, R.D.A. Jeju, Korea, 699-803 ¹Citrus Research Division, National Institute of Subtropical Agriculture, R.D.A. Jeju, Korea, 699-803

Copper fungicides are the useful chemical products used for control of foliar fungal diseases of citrus for broad spectrum control of fungal and bacterial pathogens, broad crop labeling, no known resistance, safe to plants, animal and environmnt and relatively economical disease control. But the usage of copper fungicides have been restricted for the spray injury on leaf and fruit. Three types of copper spray injury were observed in citrus orchard; 1) drop of old leaf, 2) burning of shoot and 3) rind stippling on fruit. In this study, copper spray injury was assessed on leaf and fruit of citrus by spraying of copper fungicides according to growth stage and spray season and by mixing with paraffin oil in field experiments for 2 years(2003 and 2004). In case of leaf,

the copper injury was the severest in early stage of shooting, and the injury was gradually weakened according to growth of leaf. In fruit, the copper injury was more severe in midsummer (August) than early of summer and spring season (June and July). Among copper fungicides, the bordeaux mixture which made by level of farm induced the most injury compared to other copper fungicides commercialized. Less copper spray injury was observed on treatments in which copper fungicide was sprayed as tank mixtures with paraffin oil when compared to treatment which sprayed with only copper fungicide.

E-62 Effects of Flusulfamide Granule against Chinese Cabbage Clubroot Caused by *Plasmodiophora brassicae*. X.Z. Zhang¹, S.U. Lee², J.S. Kim³, Y.S. Yoon¹, G.S. Choi¹, H.K. Kim¹, B.S. Kim¹. ¹Dept. Applied Plant science, Kangnung National University, Gangneung, 210-702; ²Young Il Chemical Co., LTD, Daejeon; ³Lab. Of Crop Protection, National Institute of Highland Agriculture, RDA, Korea

To investigate control efficacy of flusulfamide GR (granule) on Chinese cabbage clubroot caused by *Plasmodiophora brassicae*, experiment was accomplished in field located in Gangneungshi alpine area contaminated by *Plasmodiophora brassicae*. Flusulfamide GR provided 84.6% in control value and that was statistically significant difference from standard fungicides containing untreated control. To investigate ratio of reduction of resting spore according to fungicide treatment, soil of Chinese cabbage field before and after fungicide treatment were sampled and investigated density of resting spore. Resting spore density was not uniform in soil before fungicide treatment. Therefore, to investigate control efficacy of fungicide against clubroot, investigation on resting spore density was conducted before experiment and reflected in experimental design. Flusulfamide GR and DP (dust powder) provided 64.2% and 63.7% in ratio of reduction of resting spore on field soil after fungicide treatments. This result indicated that control efficacy was correlated with reduction of resting spore. When yield of each treatment was examined, flusulfamide DP, flusulfamide GR, fluazinam DP and trifloxystrobin SC (suspension concentrate) provided 14.3%, 13.0%, 13.8% and 3.8%, respectively in increasing rate in fresh weight of above-ground part comparing with untreated control. From above result, flusulfamide GR have outstanding control efficacy against clubroot of Chinese cabbage and is effectively decreasing of resting spore density in soil.