

## 제2주제 Disease Management(2-01 ~ 2-50)

### 2-01. Control Efficacy of Sodium Bicarbonate alone and in mixture with Polyoxyethylene sorbitanmonolaurate to Powdery Mildew of Strawberry.

M.H. Nam<sup>1</sup>, S.K. Jung<sup>1</sup>, S.W. Ra<sup>1</sup>, H.G. Kim<sup>2</sup>.

<sup>1</sup>Strawberry Expt. Station, Chungnam ARES, Bujuk, Nonsan, Chungnam 320-862, Korea;

<sup>2</sup>Dept. of Agricultural biology, Chungnam National Univ., Daejeon 305-764, Korea.

Powdery mildew on strawberry plants, caused by *Spherotheca aphanis* (Wallr.) U. Braun var. *aphanis*, is the most serious disease for strawberry production. There is a demand to develop the substitutes for chemicals which are more environment friendly materials. Control of powdery mildew was evaluated on Akihime, Sachinoka, Dochiodome, Noyho and Redpearl varieties grown in the greenhouse. Applications of 1%, 0.5%, and 0.25% of sodium bicarbonate (NaHCO<sub>3</sub>) in greenhouse experiments. Non-phytotoxicity was revealed on the leaves and fruits of strawberry at these concentrations. This result indicates that a mixture of sodium bicarbonate and tween 20 is a useful substitute for fungicides to control powdery mildew of strawberry.

### 2-02. Effect of culturing media on biocontrol ability and physiological state of *Burkholderia gladioli* strain B543.

Yeoung-Seuk Bae, Kyungseok Park and Choong-Hoe Kim.

Plant Pathology Division, National Institute of Agricultural Science and Technology, Suwon, 441-707, Korea.

Long-term repeated culturing of biocontrol agents on a certain medium often results in reduced biocontrol efficacy and altered physiology. Effect of culturing media on biocontrol ability and physiological state of *Burkholderia gladioli* strain B543 was investigated. Over 20 times repeated cultivation of *B. gladioli* strain B543 on Kings B medium or nutrient agar medium showed improved biological control of cucumber damping-off caused by *Pythium ultimum*, while one time cultivation on KB or NA did not. The repeated cultivation also induced the physiological changes of the biocontrol agent such as antifungal activity and the production of protease and siderophore. Our result indicates that adaptation to proper culturing medium can alter biocontrol ability and must consider in optimizing the use of biocontrol agents.

### 2-03. Control of postharvest fungal spoilage of kiwifruit with TiO<sub>2</sub> photocatalytic ozonation.

Jae-Seoun Hur<sup>1</sup>, Soon-Ok Oh<sup>2</sup>, Minjin Kim<sup>3</sup>, Jae Sung Jung<sup>3</sup>, Young Jin Koh<sup>2</sup>.

<sup>1</sup>Dept. Environmental Education; <sup>2</sup>Dept. Applied Biology; <sup>3</sup>Dept. Biology, Sunchon National University, Sunchon 540-742, Korea

TiO<sub>2</sub> photocatalytic ozonation was attempted to disinfect fungal pathogens causing postharvest spoilage of kiwifruits and to decompose fungicide residuals on kiwifruits. TiO<sub>2</sub> photocatalytic ozonation process synergistically degraded organic compound and inhibited conidial

germination of the fungal pathogen compared to single treatment of ozonation or photocatalysis. The efficient control of fungal spoilage and degradation of residual fungicide on kiwifruits indicate that TiO<sub>2</sub> photocatalytic ozonation is a very attractive method for postharvest disease control of kiwifruits as an alternative to fungicides application.

**2-04. Development of biological agent seeded on fine sand for control of brown patch and Pythium blight disease on golf course grasses.**

**Jae-Seoun Hur<sup>1</sup>, Kwang-Mi Lim<sup>1</sup> Soon-Ok Oh<sup>2</sup>, Kyu-Jin Yum<sup>3</sup>, Young Jin Koh<sup>2</sup>.**

<sup>1</sup>Dept. Environmental Education; <sup>2</sup>Dept. Applied Biology, Sunchon National University, Sunchon 540-742, Korea; <sup>3</sup>Coenbio Co., Ltd. University of Suwon, Suwon, 445-743, Korea

Antagonistic bacteria against *Rhizoctonia solani* and *Pythium* spp., causing serious damage to golf course grasses, were isolated from the top soil of several golf courses in Korea. The isolate of Limk0102 was selected as the biological agent by characterization of antifungal activity, large scale preparation, fungicides tolerance and ecological fitness to the target environment. The isolate was identified as *Bacillus subtilis* by biochemical and physiological characterization, and 16S rDNA sequence analysis. The bacterial agent was formulated as a granule type by seeding it on fine sand. The formulated agent showed high recovery rate (more than 10<sup>8</sup> cells/g sand) even after 6 month-storage at room temperature with similar antifungal activity with that of original cells. *In vitro*, the biological agent successfully exhibited antagonistic performance on bentgrass inoculated with *R. solani* or *Pythium* spp. isolated from the diseased grasses on golf courses. Field evaluation on disease control activity and ecological fitness of the agent is now under going on several golf courses.

**2-05. Changes in sensitivity to metalaxyl of *Phytophthora infestans* in Korea.**

**XUAN-ZHE ZHANG<sup>1</sup>, Byung-Sup Kim<sup>1</sup>, Kyoung-Yul Ryu<sup>2</sup>, Jong-Tae Kim<sup>2</sup> and Young-Il Hahm<sup>2</sup>.**

<sup>1</sup>Department of Applied Plant Science, Kangnung National University, Jibyun-dong 123, Gangneung-shi, Korea 210-702; <sup>2</sup>Crop Division, National Alpine Agricultural Experiment Station, RDA, Korea.

Changes of control efficacy of metalaxyl to potato late blight caused by *Phytophthora infestans* were examined in potato fields from 2001 to 2003. In 2001 and 2002, control efficacy of metalaxyl was similar to those of dimethomorph and etaboxam. However, the control efficacy of metalaxyl were decreased to 50.3% in 2003. Total 366 isolates of *P. infestans* obtained from several areas in Korea from 2001 to 2003 were examined for changes of sensitivity to metalaxyl. About 6.8% of fungal isolates examined in 2001 were sensitive, 84.1% were intermediate resistant, 9.1% were resistant to metalaxyl. Among the isolates collected in 2002, 3.9% were sensitive, 75.6% were intermediate resistant, 20.6% were resistant to the chemical. However, among the isolates obtained in 2003, 55.9% were intermediate resistant, 44.1% were resistant, but none of the isolates tested were sensitive. Both A1 and A2 mating type isolate were isolated in 2002~2003. However, all