Yeon Kyu Hong[1], Bong Choon Lee[1], Seong Sook Han[2], Won Kwon Jung[1], Jo Im Choi[1], Sung Tae Park[1] and Soon Chul Kim[1]. [1]National Yeongnam Agricultural Experiment Station, RDA, Milyang, 627-803, Korea. [2]National Crop Experiment Station, RDA, Suwon, 441-707, Korea

Bacillus subtilis strain BAC02-4 was tested for its ability induced systemic resistance(ISR) in rice against *Magnaporthe grisea*. We extend these studies to investigate the biological induction of systemic resistance in rice following treatment with the inducer isolate BAC02-4 and naturally infested with *Pyricularia oryzae*. We also determine levels of ISR activity during the period between disease development and the onset of systemic resistance. Comparition of lesion number according to applied concentration of BAC02-4 to 'Nagdongbyeo' when naturally infested with the conidia of *P. grisea*. Results from the blast nusery trial using the 'Nagdongbyeo' showed very low rice blast severity with the inducer concentration of 10^8 cfu level. Considering the low level of treatment and untreated control were observed to have developed typical susceptible lesion type. Highest protection against the rice blast pathogen when applied three times with 5 days interval as root drench at 5 to 6 leaf stage before pathogen challenge. But higher dose of bacterial inducer produced a little stunted plants with less number lesions and delayed disease development. Diseased leaf area of treated with suspension of the isolate which gave about 80% of control efficacy at 20 days later comparable to that in noninfested, inducer-free soil.

2-41. Biological control efficacy on Sclerotinia rot(*Sclerotinia sclerotiorum*) by the use of antifungal agent some *Bacillus* sp.

Yeon Kyu Hong[1], Bong Choon Lee[1], Dong Beom Shin[2], Jong Nae Hyun[1], Hang Won Kang[1] and Sung Tae Park[1] [1]National Yeongnam Agricultural Experiment Station, RDA, Milyang, 627-803, Korea,

[2] National Institute of Agricultural Science and Technology, Suwon, 441-707, Korea.

The effect of biological control agent *Bacillus* sp. (BAC03-3-1, BAC03-3-2, BAC02-4) on pre- and postemergence Sclerotinia rot of perilla (*Perilla frutescens* var. *japonica*) caused by *Sclerotinia sclerotiorum* was determined from greenhouse field trials. The ability of this antagonist to reduce germination of sclerotia of *S. sclerotiorum* was also evaluated. In the greenhouse, suspension of BAC03-3-1 application as root drench of perilla, which provided as little as 10^7 cells/ mℓ per gram of soil, significantly increased plant stand in pathogen-infested soil over that in the untreated control. All three isolates reduced the germination of sclerotia of *S. sclerotiorum* in loamy sand soils in the greenhouse. In loamy sand amended with rice bran the sclerotial germination was inversely correlated ($r = -0.79$) with perilla stand in the greenhouse. However, a higher rate of bacterial suspension with rice bran(1g dwt./100g soil) than that applied with bacterial suspensions only was necessary to achieve a comparable reduction in sclerotial germination. In field study, all three isolates added to soil to provide 10^7 cells/mℓ per gram significantly prevented Sclerotinia rot (73-85%) after 35 days of growth. The isolate BAC02-4, BAC03-3-1 and BAC03-3-2 gave final

stands of 65 to 75, 60 to 70, and 55 to 60%, respectively. The addition of rice bran(1 %) to loamy sand in the field resulted in a 10-fold increase in propagule numbers of the three isolates within 10 days of application.

2-42. Production of mass microorganisms by using simple liquid culture facility to fit the field scale test.

Yeon Kyu Hong, Won Kwon Jung, Seok Bo Song, Jong Nae Hyun, Sung Tae Park and Soon Chul Kim. National Yeongnam Agricultural Experiment Station, RDA, Milyang, 627-803, Korea

The fermentation process and subsequent processing determine the efficacy of a bioherbicide propagule. Large batches of biomass of the mycoherbicide agent for white clover, *Sclerotium* sp.(BWC98-105) was produced in simple liquid fermentator in 5 gallons vessels(Model No. 8087, Dabo Inc., Korea) with oxygen supply(DPH16000, FineTech Inc., Korea) simulating industrial conditions by utilizing commercially available, inexpensive ingredients (10 % rice bran). The maximum biomass yield of *Sclerotium* sp.(BWC98-105) was obtained after 5 days of air pumped incubation at room temperature condition(22-28 ℃). By using this simple facility, it could get fragmented or proliferated greatly and attained maximum mycelia biomass. The biomass of mycoherbicide agent consisted of hyphae devoid of spores. Biomass mycelia of the fungus 99% survival at room temperature after 2 mo. A thorough understanding of the effects of fermentation and formulation on viability and virulence is required to guide these processes. After an economical yield level of bioherbicide propagule has been achieved in a fermentation process, formulation becomes a critical factor which influences product efficacy. Because the fermentation must be stopped at a point when virulence/viability are optimum, the live bioherbicide propagule must be stabilized, formulated, and packaged.

2-43. Damages caused by infection with viruses in cut-flower production of *Lilium x. fomolongi*

B. N. Chung, E. J. Lee, J. A. Jung, H. R. Kim, G. S. Choi, J. S. Kim
Horticultural Environment Division, National Horticulture Research Institute, RDA, Suwon, 440-310, Korea

Viral disease symptoms were investigated in the field grown Longiflorum hybrid cultivars, and the damages caused by infection with *Lily mottle virus* (LMoV) and *Cucumber mosaic virus* (CMV) were assessed by comparing growth of plants produced from seeds of Longiflorum hybrid cultivar both infected by artificial inoculation and free from infection with thoses viruses. Dominant symptom caused by spotaneous infection with LMoV and CMV in the field was mottle combined with chlorotic stripe on leaves. LMoV developed brownish necrotic lesion on floral leaves. The incidence of viral disease by mixed infection with LMoV, CMV or *Lily symptomless virus* (LSV) in the filed grown Longiflorum hybrid cultivar, cultivated for more than 6 years, was 80 to 84 percent. In comparison with virus-free plants, plants doubly infected with CMV and LMoV by artificial