

suggests that amount and holding capacity of nutrient contents in soils collected from paddy field with infection of *C. miyabeanus* are relatively low compared to those in soils collected from healthy paddy field. Analysis of inorganic nutrients in rice straws showed that amount of macronutrient elements such as silicic acids, available phosphate and total nitrogen, and micronutrients such as copper, iron and zinc in rice straws from paddy field with infection were lower than those in healthy soil. Especially amount of iron and silicic acid were very low in rice straws from paddy field soils with infection. Amount of inorganic nutrients such as iron and zinc in rice seeds was the same trend as those of rice straws. These results showed that one of major factors affecting rice brown spot was amount of nutrient contents in soil and rice straw.

2-12. Post-infectious Activities of Non-systemic Fungicides Against Apple White Rot

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In order to develop an effective spray program for control of apple white rot with reduced use of fungicides, the control efficacy of several fungicides that has been intensively used for control of the disease was assessed. They were sprayed on the same tree with 15 day interval from late May to early August. Just prior to and after each spray, 100 fruits were bagged with two layered fruit bag to limit the chemical application in only one time, and the disease incidence and latent infection frequency on the bagged apples were examined. Some fungicides such as folpet, iminoctadine-triacetate and azoxystrobin showed a high post-infectious activity even though the former two are non-systemic. Folpet suppressed symptom development, iminoctadine-triacetate reduced infection frequency and azoxystrobin acted in both ways. When those fungicides were adopted in a spray program, once in a cropping season, their post-infectious activity became much greater. This activity shown by the non-systemic fungicides was supposed to be derived from the peculiar infection process of the white rot fungus of which the pathogen is usually remain latent in the corked cells of lenticel until the apple reach mature stage.

2-13. Occurrence of severe soybean-sprout rot caused by *Pythium deliense* in the recirculated production system

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Severe soybean-sprout rot was found at the mass productive factory in 2000 and 2001 and it caused 10-20% loss of the production. *Pythium* sp. was isolated almost 90% by potato dextrose agar from rotted root and hypocotyls of the sprouts. And the pathogenicity tests using test tubes with 2% water agar and small containers (30 x 30 x 50 cm, WxLxH) cultivation were shown a similar rot on roots and hypocotyls. The fungal mycelium grew rapidly on the water agar and it prevented the seed germination. Density of the *Pythium* sp. in the recycled water system at the

factory was periodically measured using a selective medium, corn meal agar with Pimaricin 10 mg, Rifampicin 10 mg, Ampicillin 100 mg per 1 liter in order to check the contamination of recycled water. After filtering step using 5 and 1 ml in the recycled system was applied and it was effectively controlled Pythium rot. The daily yield of sprout was stable and the occurrence of Pythium in the recycled water was much less after filtering.

The fungal isolates were identified as *Pythium deliense* Meurs based on various mycological characteristics on corn meal agar and sucrose-asparagine bentgrass leaf culture medium. *P. deliens* oogonia were spherical, smooth, 19-23 µm in diameter, and their stalk bending toward antheridia. Antheridia were straw hat-shaped, curred club-shaped, terminal or intercalary, monoclinal, occasionally diclinal, 12~15 x 8~11 µm, 1(~2) per oogonium.

2-14. The visible injury and physiological responses of three varieties of hot peppers to ozone.

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A growth chamber fumigation was conducted to evaluate the ozone (O₃) on the physiology of three hot pepper, *Capsicum annuum* L. cultivars, 'dabotab', 'buchon' and 'pochungchun'. Thirty-day old plants were exposed to O₃ of 120 nl l⁻¹ in the chambers for 8 h d⁻¹ for 3 days. Foliar damage due to O₃ was different from the varieties, 'dabotab' was most sensitive to O₃, 'pochungchun' was medium, and 'buchon' was resistant. Ozone symptom on the leaves was bifacial necrosis. Photosynthesis and stomatal conductance were decreased due to O₃ treatment, but they were not much different from the variety. Decreases of net photosynthesis by O₃ were 56%, 40% and 35% on 'dabotab', 'buchon' and 'pochungchun', respectively. Decreases of stomatal conductance by O₃ were 66%, 63%, and 50% on each varieties. Ozone closed the stomata and decrease net photosynthesis on hot peppers regardless of the variety. Light curves on the three varieties were showing similar patterns that O₃ damage on net photosynthesis were started at the low levels of light with or without the visible injury. Assimilation-internal CO₂ concentration curves of the three cultivars were not different due to the treatment. It means there was not significant biochemical damage inside the leaves by O₃. In conclusion, ozone closed the stomata and damaged light capturing system of the pepper leaves with or without the visible damage. Although visible damage of the leaves could be a good indicator of O₃ resistance, the ecophysiological change by O₃ were not proportional to the amount of visible injuries

2-15. Disease Suppressive Mechanisms of Antagonistic Bacteria against *Phytophthora capsici* causing Phytophthora Blight of Pepper

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In our previous studies, we selected three antagonistic bacteria, KJ1R5, KJ2C12, and KJ9C8 against *Phytophthora capsici*, the casual agent of Phytophthora blight of pepper. For elucidating