and agronomic concerns, have prompted a growing interest in alternate disease management strategies. Biocontrol of plant pathogens being ecofriendly and cost effective can contribute significantly to the improvements in crop productivity. Using Biocontrol agents as insecticides have almost no harmful effects on humans and environment. It leads to the inability of pests to develop resistance however, biocontrol often do not result better in field conditions. Limitations involving research necessary in seeking a biological control solutions to an agricultural problem is often demanding in scientific and technical terms. To adequately practice biocontrol of plant diseases, firm understanding of the host population, pests along with their natural enemies, and their behavioral ecology is necessary as the pest population will continue to exist at a level determined by the host properties, natural enemies and habitat they occupy. The effectiveness of biocontrol agents must always be considered relative to man's economic threshold.

P N-CCO 148

Physiological changes of rice plants induced by plant growth-promoting microorganisms and Silicon fertilization

G. B. Silva[1], T. B. Sousa[1], A. C. A. Souza[2], M. C. C. Filippi[2], M. V.B. Côrtes[2], H. A. Pinheiro[3]
[1]*Universidade Federal Rural da Amazônia, Plant protetcion , Belém, Brazil*
[2]*EMBRAPA Arroz e Feijão, Phytopathology, Santo Antonio de Goias, Brazil*
[3]*Universidade Federal Rural da Amazônia, Plant Physiology, Belém, Brazil*
gibarata@bol.com.br

Microorganism biopromotores (PGPM) together with the silicon fertilization constitute alternatives for sustainable agriculture, because they can promote higher productivity with reduced use of fertilizers derived from non-renewable source. However it is unclear the physiological changes promoted by the use of PGPM and silicon fertilization on rice plants. This work aimed to determine the physiological changes, during the growth promoted by the interaction among the PGPMs *Burkholderia pyrrocinia* (R-46), *Pseudomonas fluorensces* (R-55), *Trichoderma asperellum* (Ta: mixture of strains T-06, T-09, T-12, T-52) and silicon fertilization. The trial was conducted in randomized blocks, 25 treatments (1, 2, 4 and 8 t Si ha^{-1} ($CaMgSi_2O_6$)) x three PGPM (R-55, R -46 and Ta: mixture of strains T-06, T-09, T-12, T-52, control), with 5 replication, under greenhouse conditions. The different doses of silicon were incorporated into the soil 30 days before sowing. Seeds of cultivar "BRS Primavera Clear Field" were treatments with PGPM 24 hours before planting. Biomass, gas exchange, photosynthetic pigments and total sugars were evaluated 21 days after planting. Treatments with 2 and 4.tSi.ha^{-1} and in combination with PGPM promoted the growth of rice plants in 30%. The application of PGPM, alone or in combination with silicon fertilization, increase 100% the photosynthetic rate and water use efficiency (WUE), 176% content of total sugars, and reduced by 55% sweating and by 48% the stomatal conductance. The increase in the content of pigments was positively correlated with increased photosynthetic rate provided by the application only of PGPM. There was a synergistic interaction between the silicon fertilization and PGPM to biomass accumulation in rice plants. However, it was not detected an increase in physiological rate, photosynthesis and water use efficiency and photosynthetic pigments when these elicitors were combined in rice plants.

P N-CCO 149

Impacts of Methyl Jasmonate applications of wheat insect pests, their natural enemies and some agronomic properties of wheat

A. Tonğa, A. Bayram
Dicle University, Plant Protection, Diyarbakir, Turkey
abayram@dicle.edu.tr

Methyl jasmonate (MeJA) is known organic volatile compound, have roles in inducing plant defense and regulation of different plant physiological processes. The aim of present study was to investigate the effects of different MeJA doses (0.88 mM; 1.76 mM; 3.55 mM; 7.1 mM; 14.2 mM; control) on wheat insect pests and their natural enemies by employing three sampling methods (direct count, sweep net, sticky traps) during 2012-2013 under field conditions. Effects of different doses of MeJA on aphid species (Hemiptera: Aphididae), phytophagous thrips species (Thysanoptera: Phlaeothripidae and Thripidae), wheat stem sawfly species (Hymenoptera: Cephidae), Coccinellid species (Coleoptera: Coccinellidae), Syrphid species (Diptera: Syrphidae), *Collyria coxator* (Hymenoptera: Ichneumonidae), *Chrysoperla carnea* (Neuroptera: Chrysopidae) and predatory thrips species (Thysanoptera: Aeolothripidae) were found statistically significant. MeJA treatments had deterrent effects on aphid species, phytophagous thrips species and syrphid species. At the same time, MeJA treatments attracted wheat stem sawflies, coccinellids species, *C. coxator* and *C. carnea*. There was no effect of methyl jasmonate treatments on aphid parasitoids. Effects of MeJA treatments on predatory thrips species population density were not significantly different from control treatments but were varied among MeJA doses. MeJA applications also led to yield reductions and suppressed length of plants. Our results discussed in terms of controlling insect pests and attraction of natural enemies in wheat ecosystem by applications of MeJA and other jasmonate derivates.