A Novel Strategy Using Amino Acids as Elicitors to Combat Pathogenicity Caused by Alternaria solani on Selected Crops

kumar, Prakruthi

Plant diseases are controlled mostly by chemical compounds toxic to plant invaders, causing health hazards to consumers. This strongly necessitates the search for harmless means of disease control. Brinjal (Solanum melongena L.) and tomato (Solanum lycopersicum L.) are important vegetable plants affected by Alternaria solani, resulting in decreased yield. Amino acids act as natural elicitors to activate defence in plants against disease. Glycine, Aspartic acid and Lysine were selected to study growth promotion and induction of resistance. Seeds of tomato and brinjal were treated with four concentrations (1mM, 2mM, 4mM and 8mM) each of the amino acids for 3 hours before sowing. Germination tests were carried out by paper towel method. The 30-day old plants were challenged with A.solani by spray inoculation method (ISTA, 2003). Vigor index was highest in 8mM Lysine (1679) in tomato and 2mM Aspartic acid (1599) in brinjal compared to the respective controls (946 and 646). Total chlorophyll content was more in treated tomato (3.615mg ml-1) and brinjal (3.297mg ml-1) plants compared to the respective controls (1.229, 1.419mg ml-1). Phenylalanine ammonia lyase activity was higher in control tomato and brinjal plants (390, 410 µ moles min-1 mg-1 of protein) compared to treated plants (99, 120 µ moles min-1 mg-1). Treated plants showed higher phenolic content compared to controls and less Super oxide dismutase enzyme activity (1.24 and 1.501 units) compared to controls (1.99, 1.87 units respectively). Treated brinjal and tomato plants showed 46% and 50% higher resistance to attack by Alternaria solani as than controls. The above results reveal that use of amino acids can minimize the scope of chemical fungicides and contribute to the development of sustainable agriculture.

Awards Won: