

Sompop Panthong 2013: Development of Seedling Growth Promoting Substrate and Growing Medium with Efficacy to Control Stem Rot of Tomato Caused by *Sclerotium rolfsii* Master of Science (Plant Pathology), Major Field: Plant Pathology, Department of Plant Pathology.

Thesis Advisor: Associate Professor Chiradej Chamswarnng, Ph.D. 155 pages.

Seed germination and seedling growth of cherry tomato (cv. CH 154) in 16 different sowing media were studied. Seeds were sown in 72 cell-plug tray (43 cm³/cell) contained with 16 different media. All sowing media had appropriate pH range (5.5-6.5), while medium No. 11, a mix of sieved coir dust : ash pellet : compost (40:30:30 % by volume) had the greater EC (electrical conductivity), water-filled pore, total porosity as compared to the peat moss. This sowing medium provided better promotion of seedling growth in height, shoot and root fresh weight and dry weigh when compared with peat moss, eventhough the germination of tomato seeds was comparable to the use of peat moss. At 105 days after transplanting of seedlings from sowing medium N0.11 to growing medium supplemented with fresh culture (fungal colonized cooked rice) of *Trichoderma harzianum* strain CB-Pin-01 (1 kg/100 l), the plant height, shoot and root dry weights per plant, total fruits per plant, marketable yield per plant, and total yield weight per plant were higher than those seedlings transplanted from peat moss. On the Martin 's medium, growth of *T. harzianum* was detected from roots of tomato plants grown in *Trichoderma* supplemented growing medium. The growing media for cherry tomato(cv.CH 154) were developed by adjusting the ratios of coir dust: soil: composted rice husk: ash pellet size SS: ash pellet size S : compost as 30:20:20:5:5:20 and 20:30:20:5:5:20 % by volume for growing media No. 1 and No.2 The total porosity (53.20 and 58.50 %), bulk density (0.46 and 0.47 g/cm³), water-filled porosity (49.00 and 51.31 %), pH (5.7 and 6.3), electrical conductivity, E.C.(1.90 and 2.39 mS/cm) of the growing media were in the ranges of growing medium standards or closed to suitable ranges. Supplementation of *T. harzianum* fresh culture in growing media No.1 and No. 2 at 1 kg/100 l could increase stem diameter (6.66 and 2.70 %) , root length (19.34 and 28.57 %), fresh weight (1.56 and 2.09 %) and dry weight (0.54 and 21.19 %) of the above-ground part, root weight (6.66 and 19.03 %) , number of flowers per plant (2.04 and 6.32%), marketable yield per plant (32.66 and 37.85 %) and the total fruit weight per plant (42.90 and 32.54 %). Colonization of *T. harzianum* on tomato roots was detected. Growing medium No.1 supplemented with *T. harzianum* fresh culture and combined with chemical fertilizer 16-16-16 , or slow released (3 months) fertilizer 13-13-13 (osmocote) at a rate of 2 kg 1,000 l-growing medium could increase dry weight of the above-ground parts of plant (41.51 and 54.41 %) and number of flowers per plant (38.87 and 21.99 %) as compared to the control. Moreover, this growing medium No.1 combined with two chemical fertilizers could control basal stem rot of the flower bloming stage-tomato (cv. CH 154) caused by *Sclerotium rolfsii* with the increased surviving plants (14.27 and 100 %) when compared with the control.

Student's signature

Thesis Advisor's signature