

Abstract

Research of the efficient increment of ornamental *Curcuma* production in highland was carried out in 5 experiments as follows:

Experiment 1: The studies on effect of difference altitudinal planting area on ornamental *Curcuma* growth. The experiment were conducted by planting 2 Patumma (*Paracurcuma*) cultivars i.e., 'CMU miracle' and 'Chocolate' and 2 Krajeaw (*Eucurcuma*) cultivars i.e., 'Golden Reign' and *Curcuma roscoeana* Wall. at the two levels of difference altitudes (height more than 500 meters above sea level as highland and height less than 500 meters above sea level as lowland). Plant were grow for 3 months, percentage of germination and growth parameter were collected every month. The results showed that Patumma cultivars 'CMU miracle' and 'Chocolate' grown in highland area gave the higher results on germination percentage, plant height and the number of leaves per plant than grown in lowland area. In opposite, Krajeaw cultivars 'Golden Reign' and *Curcuma roscoeana* Wall. grown in lowland area gave the higher results on germination percentage, plant height and the number of leaves per plant than grown in highland area.

Experiments 2: The studies on effect of rhizome division technique on qualities and quantities of rhizome yield was conducted by dividing rhizome before planting as 3 differences treatments i.e., T1) no dividing, T2) rhizome was divided into 2 pieces and T3) rhizome were divided into 4 pieces. Rhizome of Patumma 'Chiang Mai Pink' cultivar and Krajeaw 'Laddawan' cultivar were used on this experiment. Plant were grown in plastics basket which allowed water pass through and sand mixed with rice husk charcoal ratio 1:1 were used as growing media Plant were grow for 3 month and percentage of germination and growth parameter were collected every month. The results showed that no divided rhizome before planting treatment gave the higher results on germination percentage and growth parameters than divided rhizome into 2 pieces and 4 pieces treatments. However, it was observed that there were flowering and had new shoot in both divided rhizome unless there was lower rhizome weigh than control.

Experiments 3: Studies on effect of rhizome storage temperature on rhizome qualities for off-season production of ornamental Curcuma was conducted by storage Curcuma rhizome with 2 differences temperature (room temperature and 15 °C) for six months combined with 3 differences storage methods i.e., 1) storage rhizome in open basket 2) cover rhizome with coconut dust and 3) coated rhizome with wax. Weight loss of rhizome was measured every 4 weeks and starch granule in rhizome before and after storage were detected with SEM (Scanning Electron Microscope). After storage for 6 months rhizome were planting for measure germination percentage. The results reported that storage ornamental Curcuma rhizome at 15 °C was decreased weight loss percentage than storage at room temperature. In addition, the combination of storage Krajeaw (Eucurcuma) rhizome at 15 °C with cover rhizome with coconut dust during storage period gave lower weight loss percentage and higher total non-structural carbohydrate (TNC) than wax coated rhizome treatment.

Experiments 4: the studies on methods to enhance Curcuma rhizome germination was conducted by incubating rhizome with 2 differences level of calcium carbide (200 and 400 grams) per 150 rhizome combined with 3 incubation periods (1, 2 and 4 weeks). After incubation, rhizome were planting for 3 months to measure germination percentage and growth parameter. The results on this experiment indicated that the combination of using 200 grams of calcium carbide per 150 rhizomes with incubation periods for 1 week had trend to increase germination percentage and faster growth than other treatments.

Experiments 5: the studies on techniques to extend vase life of ornamental Curcuma inflorescence was conducted by studies on 2 involved factors. The first factor was 2 stage of inflorescence (Stage1: less than 50% of real flower were opened and stage 2: more than 50% of real flower were opened) combined with 2 growth regulators supplied treatment i.e., 1) spraying Curcuma inflorescence with distilled water mixed with surfactants and 2) spraying Curcuma inflorescence with GA3 + BA (25 ppm). Vase life, number of senescence days, number of blooming flower, and change of bract and coma bract color were measured. The results reported that the

combination of cutting inflorescence of Curcuma “Ban Rai Sweet” cultivar at stage 1 (before real flower were opened) and spraying Curcuma inflorescence with GA₃ + BA (25 ppm) mixed with surfactants could extend vase life for 17.50 days while control treatment (water) had vase life at 11.00 days and the combination of cutting inflorescence of Krajeaw ‘Golden reign’ cultivar at stage 1 (less than 50% of real flower were opened) and spraying inflorescence with distilled water mixed with surfactants could extend vase life for 11.10 days while control treatment (water) had vase life at 9.60 days

