

CHAPTER 7

CONCLUSION AND RECOMMENDATIONS

7.1 Importance of Application: Physiological and Hormonal Methods

The genus Bougainvillea plant has a wide variety of traits that make it a good potential as a new ornamental plant for the floriculture industry. Characteristics of these plants that make them attractive to the industry are variation in type of foliage, production of many flowering inflorescences on one plant, and have continuous bloom and are fast growing with a short production cycle.

Therefore, the longevity of flowers and leaves are crucial nowadays. Apart from the external appearance, the length of their vase-life has become one of the most important criteria in evaluating their quality. Due to high competition in flower market, the basic condition of the acceptance of flowers to buyers is their quality. Research is being carried out throughout the world on how to improve bloom cycle, flower size, flower color and flower longevity. Many techniques have been conducted but there is still a significant lack of knowledge on bougainvillea flower enlargement and longevity. Therefore, new methods such as hormone spraying, pruning and shading to enhance plant growth, flowering process and biochemical changes of bougainvillea has been investigated.

7.2 Contributions and Findings

Formulas are being constantly altered and modified to meet the different demands of individual species and cultivars. This means that each plant needs a specific approach, and at the same time it should be as simple as possible. In order to improve the production

cycle, identify the conducive shading and prolong the vase-life of flowers, special practices and formulations are employed to ensure their maximum effectiveness with longevity. In this current research, the effect of growth regulators such as gibberellic acid and ethylene inhibitors (NAA) and the plant manipulation tactic by heading pruning to improve the flowering pattern were evaluated on *Bougainvillea* spp. In addition, studies of shading effect on flower initiation (light intensity) and concurrently longevity were also evaluated.

The observations indicated that different pruning treatments modify the root and shoot initiation, which affects the physiological and biochemical content of plants. In the case of the completed pruning, plant maintain a minimum shoot growth rate due to the low availability of potassium, sugar nutrient and lower root growth. Flower initiations, quantum yield and chlorophyll content were found to be higher in the frequent pruning treatment. Tertiary branch initiation was found to be more effective in the non-pruning condition (Table 3.2).

In addition, it can be recommended that *Bougainvillea glabra* can be grown as a shade-tolerant plant. It has been showed that in 75% shade, plant can still maintain growth by changing some physiological characters (Fig. 4.1- Fig. 4.5). In spite of low light intensity, plants maintain the growth due to the availability of potassium nutrient and high stomatal conductance. From the experimental observation, it can be inferred that flower initiation occurred due to sufficient light, sugar and chlorophyll content. None of the flower was initiated in both 50% and 70%. Apart from that, the early flower senescence was found to be due to 30% shading (Fig. 4.4).

The results of the hormonal investigation showed that GA₃ hormone causes cell elongation and little response to petal senescence (Fig. 5.3 and Table 5.1). It is also observed that 100 ppm GA₃ may be more effective to enlarge flower size compared to the 150 ppm GA₃ (Fig. 5.7). Phloemic stress can also be applied for flower longevity and large

number of flower formation. The combination treatment of 100 ppm GA₃ and phloemic stress was found to be more effective to prolong flower longevity and size.

In addition, it was observed that hormonal spraying of 100 ppm GA₃ combined with 100 ppm NAA would enhanced the flower vase life by 216% and it could protect flowers from early senescence and discoloration. Combined application of NAA and GA₃ were more effective than the single NAA used. Therefore, it is suggested that both NAA and GA₃ are to be applied on bougainvillea plant. It is also suggested that NAA should be applied during the earlier stages of bract development to prolong flower longevity.

7.3 Conclusion and Recommendations

In a conclusion, based on the current research findings, frequent pruning and non-shaded condition (0% shade) showed the best methods to induce frequent flower and prolong flower vase life. Hormonal treatments also gave the best effects on flower enlargement (GA₃ by 40%) and prolong flower vase life (NAA by 216%) of *Bougainvillea* spp. These prominent effects would really recommend the species studied as landscaping and environmental beautification purposes. Finally, it is suggested that a molecular approach can be applied to genetically regulate flowering process and vase-life of *Bougainvillea* spp. in the future research.