

Abstract

Population growth and expansion of civil life have led to the reduction of natural vegetation and increase of air pollution. Therefore, creation of landscape by using various plants for reduction of air pollution and increase of mental tranquillity is necessary. In designing green landscapes, annual and perennial plants are more important for their colour variation and shapes. Short plants with big flowers are also more valuable. Zinnia and Rudbeckia are examples of those plants that have long blooming period. These plants propagated by seed are high long. Short plants obtained by expensive F1 seeds, show generation depression, so this is necessary to find some ways to regulate height without deteriorating flower quality. Growth retardants are chemical organic compounds that slow cell division and cell elongation in shoot tissues and regulate plant height. Paclobutrazol and cycocel are two types of these chemicals that can control growth and cell elongation by inhibiting gibberellic acid biosynthesis. This study was conducted to find out the effect of paclobutrazol and cycocel on some quantitative and qualitative characteristics of Zinnia and Rudbeckia. Plants transplanted at Horticulture Department farm, College of Agriculture, Isfahan University of Technology in 2007. Seeds of Zinnia and Rudbeckia were sown on plug trays. Seedlings transplanted to pots when plants were approximately 10 centimeter in height. Paclobutrazol (5, 15, 30 mg/L) and cycocel (500, 1000, 2000 mg/L) were applied as a single foliar spray to run off when apical flowers bud presented in zinnia and when plants had 8 to 15 true leaves in rudbeckia. Control plants were sprayed with deionized water. Thereafter, plants were transplanted to the farm. Two experiments were set up in randomized completely block designs with 3 replications. Each block was 0.5 m and plants were sown 20 centimeter away. The main stem height, number of leaf and flower, number of lateral branches and flower diameter were measured every two weeks. Leaf chlorophyll content and lateral branches length were measured in the middle and the end of growth cycle, respectively. Blooming period was calculated too. At the end of growth cycle when the weather got cold, fresh and dry weight of shoot and root, leaf area, root number, diameter and area, shoot and root carbohydrate were recorded. Results indicated cycocel at 1000 and 2000 mg/L caused a significant reduction in height of zinnia. Maximum number of lateral branches (average of 17.71 cm) of Zinnia was obtained by cycocel 2000 mg/L too, while untreated plants had an average of 13.35 cm. Length of lateral branches of Zinnia was significantly reduced with cycocel 2000 mg/L and this treatment had the lowest length of lateral branches (average of 16.12 cm) compared to untreated plants (average of 24.2 cm). Treatments had no effect on plant height, number of lateral branches and length of Rudbeckia. Leaf chlorophyll increased along with increase of Paclobutrazol and cycocel concentration. Paclobutrazol 30 mg/L and cycocel 2000 mg/L caused a significant increase in leaf chlorophyll in Zinnia and Rudbeckia, respectively. Treatments showed no effect on leaf number and area of Zinnia. Paclobutrazol 30 mg/L caused a significant reduction in leaf number of Rudbeckia. This treatment had the lowest leaf number (average of 28.54), while untreated plants had maximum number of leaves (average of 37.62). Paclobutrazol 30 mg/L caused a significant reduction in leaf area in Rudbeckia too. Cycocel caused significant difference in average number of both Zinnia and Rudbeckia flowers. Cycocel 2000 mg/L had the greatest average of flower number (7.39) in zinnia, while in untreated plants average of flower number was 5.11. Cycocel 2000 mg/L caused significant increase in average of flower number, compared with cycocel 500 mg/L. Treatments had no effect on flower diameter of both Zinnia and Rudbeckia and on blooming period of Zinnia. The highest rate of cycocel caused significant increase in blooming period of Rudbeckia and had 125.66 days of blooming period compared with untreated plants