This study was carried out in the experimental nursery of the Ornamental Horticulture Department, Faculty of Agriculture, Cairo University, Giza, during the two successive seasons of 2007 and 2008. The aim of this study was to investigate the possibility of growing sunflower (Helianthus annuus L.) as a pot plant using different potting media and growth retardant treatments. The plants were grown in 25-cm pots filled with clay, clay+sand, clay+peat or sand+peat, and were treated twice with paclobutrazol as a soil drench at 1.5, 3.0, 4.5 or 6.0 mg a.i./pot, or with Pix as a foliar spray (mepiquat chloride) at 500, 1000, 1500 or 2000 ppm, in addition to an untreated control. The recorded results showed that using clay+peat gave the best results for all the tested vegetative growth and flowering characteristics. Also, plants grown in clay+peat had the highest contents of chlorophyll (a and b) in the leaves, total carbohydrates in leaves and roots, N in the leaves, stems and roots, as well as the highest P contents in the leaves and roots, and the highest K content in the leaves. In most cases, the different growth retardant treatments decreased plant height, whereas other vegetative growth characteristics (number of leaves, leaf area, plant fresh and dry weights) gave different results in the two seasons. The best control of plant height (i.e. the shortest plants) was achieved with using paclobutrazol at 6 mg a.i./pot (in the first season) or Pix at 2000 ppm (in the second season). Growth retardants also decreased flower diameter, but increased the fresh and dry weights of flower-heads. The paclobutrazol and Pix treatments also increased the leaf contents of chlorophyll (a and b) and total carbohydrates, but decreased the carotenoids content in leaves, and the total carbohydrates content in the stems. The N content in leaves was increased by paclobutrazol at 6 mg a.i./pot, and by all the Pix treatments (especially at 1000 ppm), compared to the control. Also, all paclobutrazol and Pix treatments increased the N content in stems and roots, as well as the K content in the leaves, stems and roots. In contrast, raising the application rate of paclobutrazol or Pix caused steady reductions in the P content in leaves. It was concluded that sunflower plants should be grown in clay+peat, and treated with paclobutrazol at 6.0 mg a.i./pot, or Pix at 2000 ppm.

Key words: Sunflower, Helianthus annuus, Paclobutrazol, PP-333, Pix, Mepiquat Chloride