There has been little investigation into the effects of ozone (O_3) on flowering plants around settlements, even though such plants are known to be threatened by elevated O_3. In this study, we used open-top chambers to assess the ornamental value of marigolds (Tagetes erecta Linn.) and four petunia (Petunia hybrid Vilm.) varieties in terms of their growth and physiological responses to elevated O_3. The aboveground biomass decreased by 7.4% in marigolds and by 19.4-23.6% in four varieties of petunia in response to elevated O_3. The underground biomass decreased by 22.0% in marigolds and by 30.8-53.8% in four petunia varieties treated with elevated O_3. Flower biomass and diameter were markedly reduced by elevated O_3 in petunias, but not in marigolds. O_3 also accelerated leaf yellowing in different plant species and varieties, owing to a higher degree of degradation of chlorophyll than carotenoids, as well as an increase in flavonoid contents. Thus, O_3 stress responses should be considered when choosing flowering plants for their ornamental value.