

### Abstract

The vase life of roses grown in coal bottom ash (CBA)-amended media was evaluated. CBA is enriched in calcium, a nutrient implicated in delaying senescence. Four rose cultivars, Cara Mia, Dakota, Santa Fe and Pink Osiana, were grown (from started eye plants) in four media: a 50% CBA medium and a peat: vermiculite medium amended with calcitic and dolomitic lime (1:1) were used as "high calcium" media, whereas a 25% CBA medium and a peat: vermiculite medium amended with dolomitic lime only were used as "low calcium" media. Yield was not different for roses from different media, and a subjective visual and scent assessment by a panel of judges showed no media effect. Vase life of the freshly harvested roses was evaluated over several days. Elemental analysis of the leaves showed that roses grown in the "high Ca" media had greater Ca in the leaf tissue as well as longer vase lives (12.6 and 13.5 days) when compared to those grown in the low Ca media (12.1 and 10.9 days). However, petal tissue Ca was not affected by media and was not correlated with vase life. Petal tissue Ca was approximately 12 times lower than leaf tissue Ca. Ca and Mg increased in the petal tissue over the vase life of the senescing petals. A comparison of Cara Mia, Pink Osiana (vase life of 14 and 16.5 days), Dakota, and Santa Fe (vase life of 8.5 and 9.4 days) showed that the longer lived Cara Mia and Pink Osiana had lower leaf and petal Ca levels. Cara Mia and Dakota followed a similar kinetics of electrolyte leakage (total E.C. and  $K^+$ ) during their respective vase lives. In both cultivars, the cell wall fraction comprised about one half of the petal dry weight and virtually all of the petal calcium was found in this fraction. Hot water-extractable calcium decreased over the vase life, while tightly held calcium increased. Ethylene production was greater for the longer lived cultivar, but the peak in ethylene production occurred later, correlating with vase life.