Abstract

Asiatic hybrid lily bulbs cultivars ‘Marseille’, ‘Vermeer’, and ‘Vivaldi’ were held in 0–8% O_2 or air at 22–24 °C under fluorescent lighting to evaluate the potential use of modified atmospheres to extend shelf life. Following approximately 30 days of storage, bulbs were forced in the greenhouse. Storage in 1% O_2 was the most effective treatment. Shoot elongation and flower bud development was greatly inhibited at 1% O_2 in all cultivars, while concentrations at or below 0.5% were destructive to shoot tissues. Air-stored bulbs produced stunted plants and a high incidence of flower bud abortion. One percent O_2 delayed anthesis and decreased the number of flower buds compared with air in all cultivars, but flowers developed normally, and plants were taller compared with air-stored bulbs. The quality of ‘Marseille’ plants grown from bulbs held in 1% O_2 was high. The quality of ‘Vermeer’ was acceptable, but a small percentage of plants grown from bulbs held in 1% O_2 did not emerge. ‘Vivaldi’ performed poorly due to a high percentage of blind and non-emerging plants. Results demonstrate that low O_2 storage may extend the dry-sale shelf life of certain Asiatic hybrid lily cultivars by inhibiting shoot elongation and flower bud development while producing a flowering plant that is acceptable to the consumer.