**Introduction**
Vitrescent dark spot is the main calcium-related physiological disorder observed in late season peach cultivars in the Ebro River Basin, Spain. This alteration implies the development of localised translucent and dark brown areas in the fruit mesocarp with no external symptoms to be seen until long after harvest. Late season peach cultivars are characterised by having a higher value and outstanding quality since they grow in bags, which are placed around them after fruit thinning.

**Materials and Methods**
Calanda peaches (cv 'Calrico') were sprayed with calcium-containing solutions four times, every 15 days, since the beginning of May to the end of June just before bagging in 2009. The formulations applied to the fruit surface consisted of 120 mM Ca supplied as CaCl₂ or Ca-Propionate in combination with: (1, 2) 0.02% of a commonly applied polysorbate surfactant, (3, 4) 0.05% of an organosilicon surfactant (OSS), (5, 6) 0.5% of a "food additive adjuvant" (FAA) and (7) control fruits. Following the application of treatments, samples were collected after 7 days and Ca, Mg and K concentrations were determined in the mesocarp and exocarp of fruits after wet digestion and by Atomic absorption/Emission Spectroscopy. After one month storage at 0°C, the external appearance was ranked as well as the development of vitrescence and internal browning.

**Results and Discussion**
With regard to peel and pulp calcium concentrations, significant increases were only recorded for OSS and FAA, CaCl₂ treated peaches on July 26th. One month after cold storage, the fruits from FAA CaCl₂ foliar applications led to the lowest vitrescent dark spot incidence as derived from the low index recorded for this treatment. Besides, regarding chilling injuries, in general, all treatments excepting Ca-propionate plus polysorbate, were effective in reducing the browning index value.

**Conclusions**
None of the treatments was observed to increase Ca mesocarp and exocarp concentrations at the time of harvest, beneficial effects in terms of increased fruit quality and storability were recorded for certain Ca-adjuvant combinations. It is concluded that more research efforts are required to develop optimal Ca spray formulations and spraying programmes that may efficiently and systematically decrease the incidence of Ca related disorders in fruit crops.