INTRODUCTION - Leucospermum R.B. is a genus of the Proteaceae family whose inflorescences play an essential role in the cut flower trade worldwide. In the Canary Islands, they are an import crop in mid-altitude rural areas, whose future depends on obtaining high quality plants quickly, in quantity, applying techniques involving propagation through cuttings. This research was carried out in the greenhouse of the Agricultural Engineering Section and the Cellular Biology laboratory at La Laguna University. The aim was to determine the effect of indole acetic acid (IAA), hydrogen peroxide (H₂O₂) and SEFEL (Acosta, 2013), in treatments alone or in combination, on the vegetative propagation with terminal cuttings of the cultivars of Leucospermum ‘High Gold’, L. ‘Spider’, L. ‘Succession II’ and L. ‘Tango’. Their responses were examined by light microscopy.

MATERIAL

L. ‘High Gold’

L. ‘Spider’

L. ‘Succession’

L. ‘Tango’

Mother plants [6-8yrs-old]

Cutting of semi-hard wood; (20 cm length)
20 cuttings by treatment

Propagation system
Substrate: polyurethane plus coco fiber.

Rooted cuttings
New plants

Vegetative Propagation
What were the treatment (T) applied?

VEGETATIVE PROPAGATION

T1: IBA 2000 ppm

T2: H₂O₂

T3: IBA 2000 ppm + H₂O₂

T4: IBA 4000 ppm

T5: SEFEL

T6: IBA 2000 ppm + SEFEL

MIST SYSTEM

Relative Humidity 70% T=21°C, radiation 50%-

RESULTS

The cross sections of the cuttings (CTR, CNTR) showed structural modifications attributable to the conditions applied in the different treatments: presenting lengthening of the vascular bundles, total disorganization of the tissues due to the different planes of cell division, and greater meristematic activity in the cambial area, in the parenchymatous cortex, as well as an increase in phenolic compounds.

The tissues organization in the cuttings after different treatments

The different treatments, alone or combined, produced transplantable cuttings (CTR) in three of the cultivars, except in L. ‘Succession II’.

The highest percentages of CTR were obtained in L. ‘High Gold’ with the combination of H₂O₂ + IBA-4000 ppm, in L. ‘Spider’ through the use of H₂O₂ + IBA-2000 ppm, and in L. ‘Tango’ with IBA-4000 ppm.

Conversely, L. ‘Succession II’ with SEFEL was the most favourable, with lower cutting mortality (DC) and higher non-transplantable roots (CNTR).

CONCLUSIONS

In the different stages of trials, dead cuttings (DC), cuttings without callus (CWC), cuttings with callus (CC), cuttings with non-transplantable roots (CNTR) and cuttings with transplantable roots (CTR) were evaluated:

The data depends on the treatments; with all, at six weeks there were already cuttings with non-transplantable root. And on the eighth, they presented cuttings with transplantable roots. T1 reached 100% at the twelfth week. The length of the transplantable root was 3.5 cm.

High percentage of CWC (in base of the cuttings and area removed leaves) in all treatments, decreasing progressively. The highest numbers with T2: 45% and T1: 35%.

The maximum value T3: 55%, in week 16. At 6 weeks, CNTR was observed in all treatments, being the highest T3 (9%). At the beginning, 22% of CTR was recorded with T3 and lower with the others. The percentages increased reaching the maximum values 95% with T6.

SEFEL is the treatment with lowest mortality. CC aren’t observed in any treatments. The first roots appear with T1: 7 and T6: 10; the maximum was reached at 13 weeks with T16. CTR were not observed on any treatment, during the trial period.

DC are observed from week 12 with T5 and T7. There are practically no calluses, and appeared in the area of withdrawal of the basal leaves. The highest percentage was obtained with T7. At 10 weeks, the number of CTR is high and decreases as the CTR increase, reaching 55% at week 22, with T4.

The treatments led to a series of anatomical changes in the stem-cuttings of all cultivars. These contributed positively to propagation via cuttings.