

EFFECTS OF KELPAK® *Ecklonia maxima* SEAWEED PRODUCT ON QUALITY AND YIELD OF RED GLOBE TABLE GRAPES IN SICILY, ITALY.

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Abstract

The natural biostimulant, Kelpak®, was applied to Red Globe table grapes in Sicily, Italy in three different programs together with gibberellic acid (GA). Kelpak® was applied to deliver a total of 12 L product per hectare per season. All Kelpak® treatments improved berry size, berry weight, berry firmness, sugar content and bunch colour, while one of the treatments also improved bunch weight above GA application alone. Kelpak® applied four times at 3 L/ha gave the best result, followed by two applications at 6 L/ha and then three applications at 4 L/ha. The results confirm that Kelpak® can be a useful tool to improve yield and quality of table grapes in Italy, as proven in other parts of the world.

Background and Aim

The synthetic growth regulators GA, abscisic acid and cytokinins and natural biostimulants such as seaweed extracts are commercially used to improve the quality and yields of table grapes. Kelpak®, a liquid product extracted from the giant seaweed species *Ecklonia maxima*, has been used with great success to improve table grape yields and quality as reported at the 5th International Table Grape Symposium (Lombard, 2007; Orellana, 2007). A field trial was conducted on Red Globe in Sicily, Italy to evaluate these positive effects in another important table grape producing region of Europe.

Experimental Procedure

The trial was conducted in 2012 using a Red Globe vineyard with plant spacing 2.8 x 2.8 m in Licodia Eubea, Sicily, Italy under standard farming practices for the region. Kelpak® was applied in three treatment programs including different rates in 600 L water/ha at different application times. The timings and number of applications for each treatment all delivered a total of 12 L Kelpak® per ha. The Kelpak® treatments were compared to an untreated control, as well as a positive control where GA was applied twice (BBCH 71 and 73) as per standard practice (Table 1). All Kelpak® treatments received the GA treatment as well. Trial plots consisted of 9 plants per replicate and each treatment was replicated six times in a randomised block design. Berry diameter, berry firmness, berry weight, berry colour, soluble solid content, bunch weight and cracking of berries were evaluated using standard procedures. Data were analyzed for statistically significant differences ($p=0.05$, Student-Newman-Keuls).

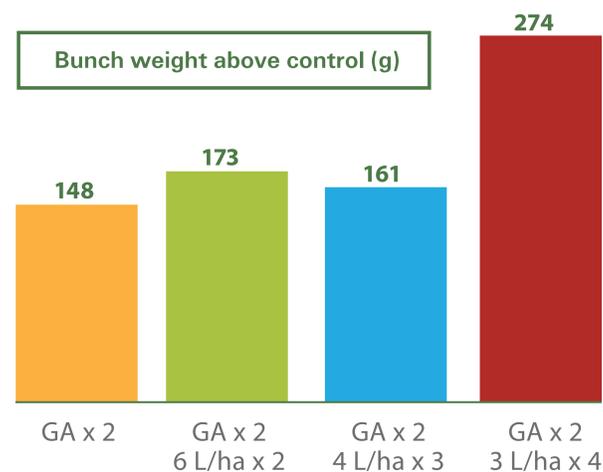
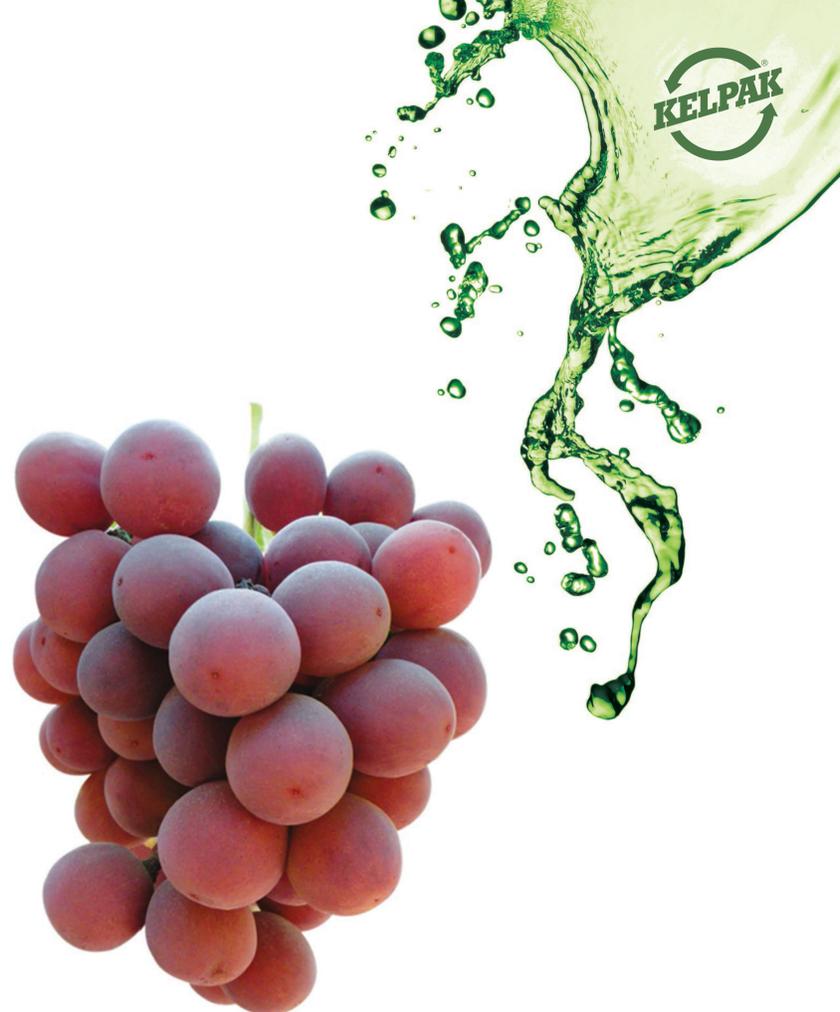


Table 1. Effect of Kelpak applications on quality and yield of Red Globe table grapes, Sicily 2012.

| Measurement | GA x 2 *71, 73 | GA x 2 *71, 73 **6 L/ha x 2 75,77 | GA x 2 *71, 73 **4 L/ha x 3 71,73,75 | GA x 2 *71, 73 **3 L/ha x 4 71,73,75,77 | Untreated Control |
|------------------------------|-------------------|--|---|--|----------------------|
| Berry Size (mm) | 26.8c | 27.5b | 27.0c | 28.0a | 23.4d |
| Berry Weight (g) | 10.2c | 10.8ab | 10.5b | 11.0a | 8.5d |
| Berry Firmness | 2.0c | 2.5b | 2.6ab | 2.7a | 1.8d |
| Soluble Solids:°Brix | 14.8d | 15.5b | 15.1c | 16.1a | 15.4b |
| Colour lower value = best | 2.6a | 1.8b | 1.8bc | 1.6cd | 1.6d |
| Bunch Weight (g) | 1282b | 1307b | 1295b | 1408a | 1134c |

*BBCH scale for application stages of GA

**Rate and BBCH scale for application stages of Kelpak®

Values with different letters differ significantly at the 95% confidence level



REFERENCES

Lombard, PJ and Lourens, AF, 2007. The use of Kelpak, a natural liquid seaweed extract as a tool for improving table grape quality in South Africa. Poster presentation, 5th International Table Grape Symposium, Somerset West, South Africa.

Orellana, J, 2007. Effects of an auxin based product extracted from the seaweed *Ecklonia maxima* on berry quality and post-harvest behavior in table grapes in Chile. Oral presentation, 5th International Table Grape Symposium, Somerset West, South Africa.

Results and Discussion

Kelpak® foliar spray at 3 L/ha applied at BBCH 71, 73, 75 and 77 was the best treatment, with significantly better results in berry size, berry firmness, berry weight, sugar content and bunch colour and weight compared to the GA control (Table 1).

Second was Kelpak® at 6 L/ha applied after GA applications at BBCH 75 and 77, with significantly better results than GA control in berry size, berry firmness, berry weight, sugar content and bunch colour.

Kelpak® at 4 L/ha applied at BBCH 71, 73 and 75 was also better than the GA control treatment in terms of berry firmness, berry weight, sugar content and bunch colour, but similar in berry diameter and bunch weight. GA control was better than untreated control in all variables except sugar content and colour, where the untreated control had better values.

Yield increase on bunch mass alone for Kelpak® 3 L x 4 was 10% compared to GA control, while the better berry size and bunch colour would also result in more boxes to fall into export class achieving better value per box. None of the treatments showed any visual signs of phytotoxicity and berry cracking was absent in all treatments.

The results confirm that the seaweed biostimulant Kelpak® is a useful tool to improve the yield and quality of table grapes also in an important production region of Italy, as was proven in other production areas around the world (Lombard, 2007; Orellana, 2007).



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