MOLEAER
ADVANCING NANOBUBBLE TECHNOLOGY

LAEVO
SUSTAINABLE SOLUTIONS

NANOBUBBLES INCREASE AVOCADO PRODUCTIVITY AND FRUIT SIZE

Client Case Study: Laevo Group, Chile

Crop:	Flow:	Unit Type:	Installed:	Results:
Avocados, 1 ha	70 GPM	Nexus 50 with external oxygen	2020-2021	• Improvement in vegetative tree growth and productivity • 40% increase in fruit size category over '50' • Increase in dissolved oxygen from 8 ppm to 15 ppm

Moleaer's Nexus™ nanobubble generator was installed in-line with existing irrigation systems to supersaturate irrigation water through drip irrigation lines.

Nanobubble technology applied in the irrigation of avocado plantations in clay soils results in significant improvements in vigor and yield, including substantially more fruit in larger size categories.

Problem:

The avocado is one of Chile's most important fruit crops, with large volumes exported yearly to many countries. Most avocado production in Chile, about 30,000 hectares, is in the Valparaíso Region. Drought is a constant concern in this area. Because drought decreases avocado yields but also stresses avocado trees, making them more susceptible to diseases and pests, some orchards are irrigated. However, water availability in Chile's avocado orchards is also affected by the fact that this tree is sensitive to root asphyxia, and a significant percentage of the country's avocado trees are planted in heavy clayey soils where water movement and oxygen availability is significantly restricted.

The industry needs a solution that will minimize root asphyxia and maximize productivity in irrigated avocado orchards located in clayey soils.

Solution:

Nanobubble technology super-oxygenates irrigation water. When root cells absorb water with very high levels of dissolved oxygen, their metabolic rates increase. They are thus able to continually absorb more nutrients and water from the soil over a given period of time. The overall rate of root growth and tree/plant growth that results is therefore significantly higher. Root cells grow faster and spend less energy in the absorption of nutrients, while also benefiting from the favorable environment created by higher oxygen levels in the root zone. Beneficial microbes flourish in higher oxygen environments and the growth of pathogens is inhibited. Greater overall tree health and higher crop productivity is achieved.

In 2020, in partnership with Kapicua Research Center, avocado firm Laevo Group began a two-year study of the effects of providing avocado trees in clayey soils with super-oxygenated irrigation water created through the use of Moleaer nanobubble generators. Kapicua is a Chilean-based sustainable agro-industrial technology provider and distributor that has partnered with Moleaer to do independent validation of Moleaer nanobubble technology.

In the study, the following were measured over 2020 and 2021: vegetative growth, percentage of flowered crown, macro and micronutrient content at the foliar level, leaf dry matter, salt damage in leaves, time of harvest, yield, fruit size distribution and post-harvest fruit quality.

After the first season, investigators found a significant improvement in vegetative tree growth and productivity. The harvested fruit also contained a greater percentage of larger fruit, with a 40% increase in size categories over '50.'

The Kapicua research and development team – in cooperation with other research centers, exporters and producers – has also measured similar positive impacts of using nanobubble technology in the production of cherries, blueberries, strawberries, walnuts and tomatoes across different countries in Latin America.

Benjamín Labbe, Technical Manager at Laevo Group, states that using Moleaer nanobubble generators to super-oxygenate irrigation water "benefit[s] the cultivation of avocados in the region…where it greatly helps oxygenation and delivers multiple benefits" that improve plant health and crop quality.

The avocado is one of Chile's most important fruit crops, with large volumes exported yearly to many countries.

Rev. 012822