



Yield and quality enhancement for cherries

The Harpin response in plants promotes cell wall strengthening and stress tolerance mechanisms which increase marketable yield

ProAct® is a bio stimulant product containing 1% Harpin $\alpha\beta$ protein. It is a natural means of improving tolerance to abiotic stresses such as frost as well as final fruit quality.

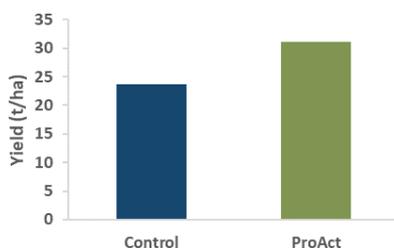
Harpin proteins are isolated from plant pathogenic bacteria. When Harpin $\alpha\beta$ is applied to plants the proteins function as an elicitor, triggering defense and growth responses. Plants which have been primed by Harpin $\alpha\beta$ protein therefore respond faster and more intensely to subsequent real stress events.

ProAct® stimulates an increase in expression of genes involved in:

- Nutrient absorption & translocation including increased in the most bio-effective form of calcium in cell walls.
- Fruit firmness.
- Photosynthesis.
- Abiotic stress tolerance

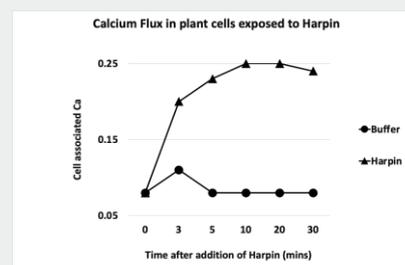
Increased marketable yield – Spain 2009

In replicated, randomized trials carried out by an independent trialist in Zaragoza, Spain, **ProAct®** significantly increased cherry (var. Lapins) yield by 31% ($P < 0.01$). **ProAct®** was applied three times; at petal fall, 30 days after petal fall and 15 days before harvest. Each treatment was replicated 4 times on plots of 4 trees. In the same trials, Brix ($^{\circ}B$) and fruit size (mm) were also increased by 25.8% and 11.5% respectively.



Harpin $\alpha\beta$ and cell wall calcium

The Harpin $\alpha\beta$ protein in **ProAct®** works by activating stress hormone pathways. This stimulates Ca^{2+} translocation, directing more Ca^{2+} towards storage in cell walls. The increase in cell wall calcium content makes them stronger and able to withstand the mechanical and osmotic pressure of freeze/thaw cycles.



The Harpin $\alpha\beta$ protein response also increases the production of antioxidants and osmoprotectants which further enables plants to maintain membrane integrity during frost events.

For more information, please contact your usual Agrii agronomist, our **Customer Services Team** on 0845 607 3322 or email fruit.solutions@agrii.co.uk

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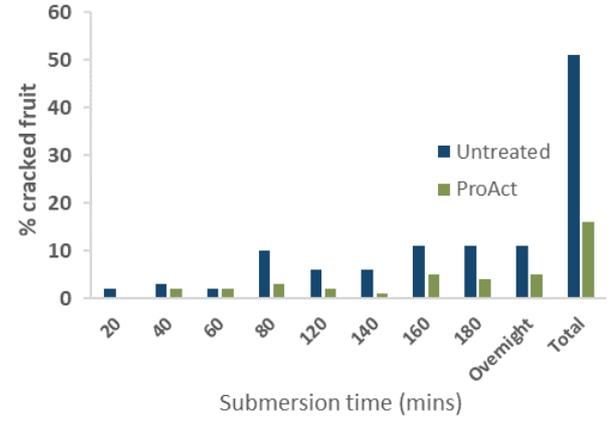
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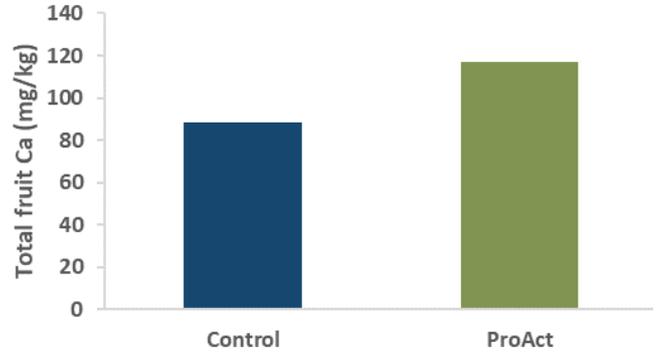
Improved fruit quality – Oregon, USA 2010

Fruit splitting and cracking occurs due to imbalanced water realtions exerting pressure on the cuticle. In trials carried out by an independent trialist in Oregon, USA, sweet cherries (var. Skeena) were submerged in deionized water to simulate rain-induced soaking. 25 fruits from each treatment were sampled at each timepoint. From 80 minutes onwards, % cracked fruit was significantly (P<0.01) reduced in the group treated with ProAct®. In total, ProAct® reduced cracking by 68%.



Increased fruit calcium content – Spain

Calcium is a critical structural component of cell walls (see previous page). In fruit samples (var. Sonata) taken from commercial grower trials in Spain, total fruit calcium content as measured at an independent laboratory was 32% higher in the ProAct® treated cherries than the grower’s standard. Elevated calcium helps to strengthen fruit cell walls and reduce the risk of cell collapsing disorders.



Application advice for frost protection:

Apply 200 g/ha a minimum of 24 h prior to onset of frost. Repeat applications every 4 – 5 days in prolonged frost periods.

Integrate ProAct® as part of a frost risk mitigation strategy:

- + Site selection and management to avoid cold air accumulation in the orchards
- + Late prune to delay bud break in susceptible areas, also leaving sacrificial
- + Reduce ground cover and cultivations to optimise soil temperatures in April and May
- + Frost protection equipment to raise air temperature e.g. bougies, frost drains, frost fans

Full programme:

Rate	Number of Applications	Application timing
200 g/ha	3	Up to 50% flowering (GS60-65)
		Pit hardening (GS77-79)
		Colour change (GS81)

Compatibility

- + Do not use water with a pH of less than 5 or greater than 10.
- + Apply the spray mixture within 8 hours of preparation.
- + In tank mixes apply ProAct to the tank first and mix well

ProAct® (Harpin αβ) is exempt from MRL restrictions in United Kingdom.

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