







Improving Fruit Finish

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Russeting

Russeting in apples and pears is a physiological disorder of the fruit skin that results from microcracks in the cuticle and the subsequent formation of a periderm. It is caused by environmental factors (cool weather and frost injury), field-applied chemicals such as copper and some surfactants, and fungal infections, such as powdery mildew.



Skin (retiform) Russeting

Stem end russeting





GA4+7 (ProVide) Stimulates Division of the Epidermal Cells 'Golden Delicious'

Water (2000 cells per mm²)

GA4+7 (2500 cells per mm²)



Source: Eric Curry, 2011

Fruits sampled 12 June





Gibberellins (GA4+7) are plant hormones commercially known for reducing the incidence of russeting and cracking by providing cell elasticity.



ProVide 10SG® is a mixture of two gibberellic acid (GA) plant growth regulators: GA4 and GA7. Regulex 10SG is used to improve fruit finish by reducing russeting of apples.

When applied from early petal fall until 40 days after full bloom it conditions the fruit surface of apples and pears, making it more elastic and able to withstand extremes in moisture and relative humidity.





Skin Russet Control

Untreated (scanned electron microscopy)



GA4+7 treated apples (scanned electron microscopy)







Skin Russet Control – EU Central (NL, BE, AT, DE, North FR) Regulex (Provide) 10SG vs. liquid

Mean of 14 studies in Central Europe from 2004 to 2009 'Cox's Orange' (2x) 'Elstar' (2x) 'Golden Delicious' (9x) 'Tentation' (1x)





Minneiska

apple











Improving fruit finish of Minneiska with ProVide and Parka

TRT	PF	PF+7	PF+14	PF+21	PF+40	PF+54	PF+68	PF+82
1	UTC	UTC	UTC	UTC	UTC	UTC	UTC	UTC
2	3oz Provide	3oz Provide	3oz Provide	3oz Provide	-	-	-	-
3	3oz Provide	3oz Provide	3oz Provide	3oz Provide	6oz Provide	6oz Provide	6oz Provide	6oz Provide
4	3oz Provide +Parka	3oz Provide	3oz Provide	3oz Provide + Parka	6oz Provide + Parka	6oz Provide + Parka	6oz Provide	6oz Provide
5	Parka	-	-	Parka	Parka	-	-	-
TRV: 150 gallon trees (1.5x) \rightarrow Tunnel spraver @ 100 GP/								

Parka: 1 gal/100 TRV: 150 gallon trees (1.5x) \rightarrow Tunnel sprayer @ 100 GPA

1 pt Regulaid = late Provide appl.

Label: maximum application per acre per season: 42oz (1200 gr)







Effect of ProVide and Parka on Fruit set – Minneiska 2018



mistry





Effect of ProVide and Parka on Fruit Russet – Minneiska 2018







Effect of ProVide and Parka on Fruit Elongation – Minneiska 2018





Lenticel condition









Improving yield and fruit finish

Minneiska



<u>4 oz Promalin \rightarrow Pink to Bloom</u> 1 pouch ReTain ($\frac{1}{2}$ at 50% bloom + $\frac{1}{2}$ pouch end of bloom)

ProVide → Petal fall : 2oz 3x every 7-10 days: 3oz

Late Applications? Cheek crack/flecking

Label: maximum application per acre per season: 42oz (1200 gr)





Managing Scarf Skin on Red Strains of Gala Jim Schupp – Penn State Univ.



Scarf Skin "smooth russet" -

- A physiological disorder
 - Results in a dull gray appearance
 - Caused rejection of Gala by retailers
- Occurs during 60 DAFB
- Same anatomical origin as russet

Scarf Skin







Thank you!!