



Chemical thinning of 'Conference' with metamitron (Brevis)

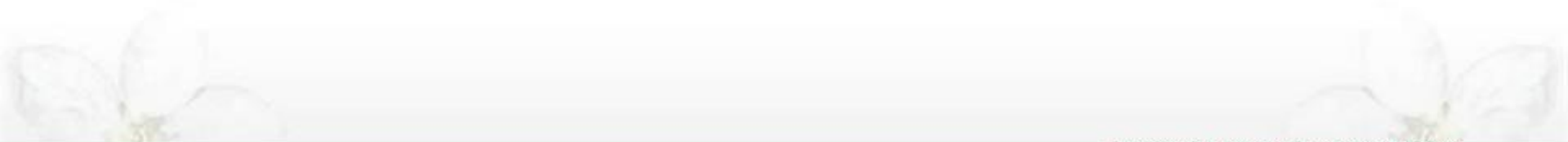
J. Vercammen*, A. Gomand,
V. Siongers and D. Bylemans

Pcfruit-Proeftuin pit- en steenfruit
(Sint-Truiden - Belgium)



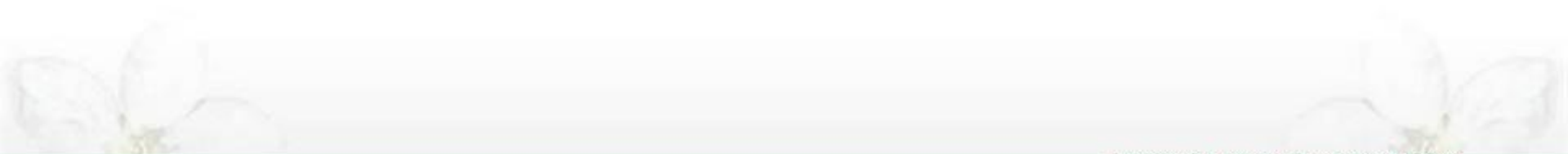
Topics

- Acreage and production of pears in Belgium
- Comparison 6-BA – metamitron
- Time of application of Brevis
- Dose of Brevis
- Brevis after treatments with GA
- Brevis after spring night frost
- Conclusion





Acreage and production of pears in Belgium





Acreage of pears in Belgium (ha)

Varieties	1990	1995	2012	2015	2016
Conference	2.357	3.900	7.351	8.050	8.360
Doyenné	711	890	677	630	616
Durondeau	350	470	228	165	150
Others	230	200	323	495	565
Total	3.648	5.460	8.579	9.340	9.691

Conference 2016 = 86,3 %

New plantings = 93 % Conference

Acreage apple 2016: 6.491 ha

2014: 374.325 Tons

2015: 369.135 Tons

2016: 335.505 Tons*



Comparison of 6-BA and metamitron



6-BA

- 6-benzyladenine
- Synthetic cytokinin
- Safe fruit thinning
- Better fruit size
- Stronger flower buds
- At least 18 °C (day of application + days after)
- Globaryll 100 (100 g/l 6-BA) – 2 l/ha
- Exilis (20 g/l 6-BA) – 10 l/ha



Brevis (metamitron)

- Herbicide
- Specially formulated to thin apples and pears
- Reduces photosynthesis by up to 50 %
- Stress situation
- Leaves are lighter of colour
- No minimum temperature needed
- Maximum dose: 2x 2.2 kg/ha



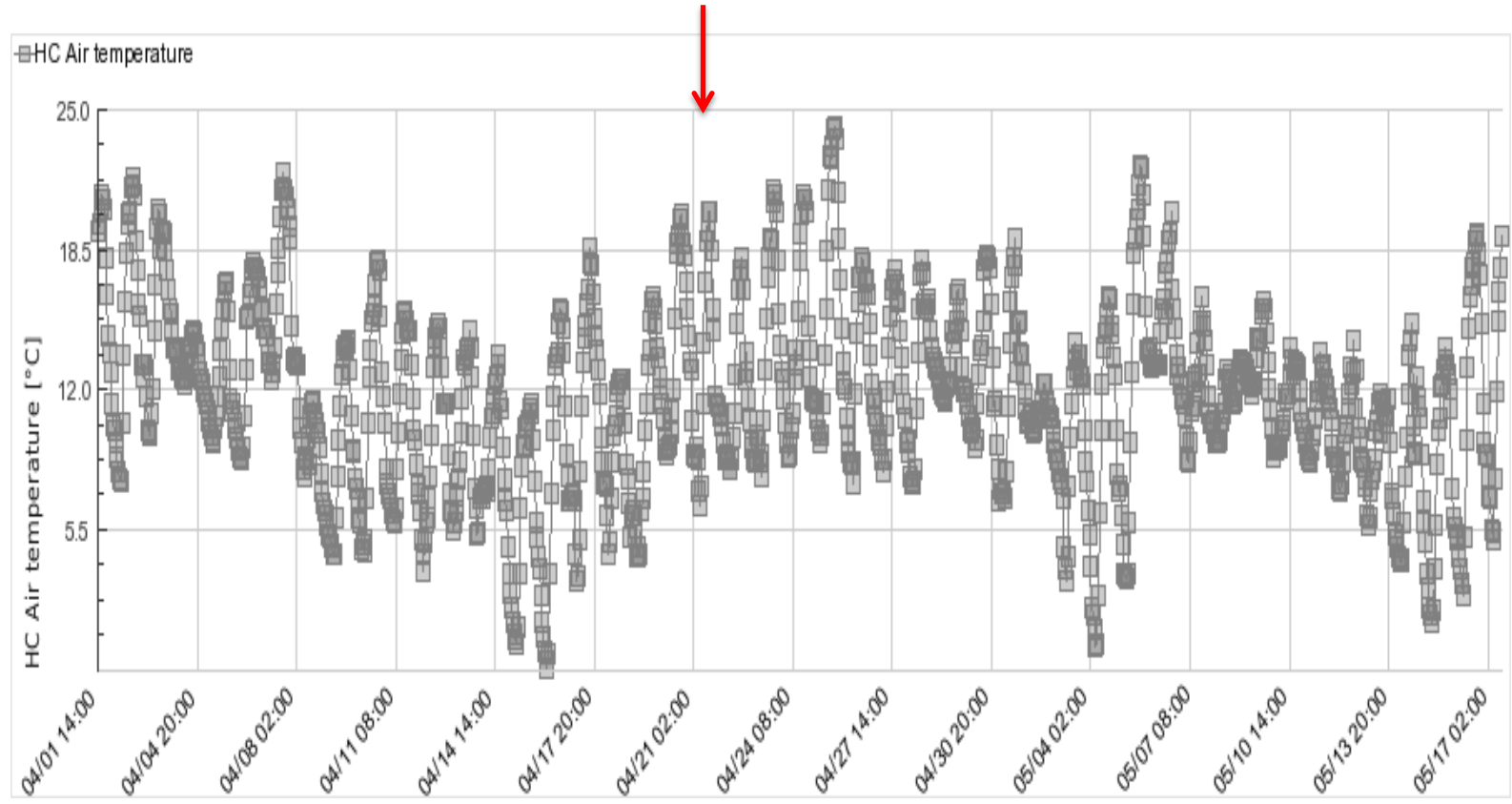
Comparison of 6-BA and metamitron

- Variety: Conference
- Planting year: 2002
- Rootstock: Quince Adams
- Planting distance: 3.50 x 1.75 m (1.469 trees/ha)
- Exilis: 10 l/ha – Brevis: 1.5 kg/ha at 8 mm



Comparison of 6-BA and metamitron

Temperature 2014





Comparison of 6-BA and metamitron

Fruit set 2014

Object	Number of flower buds	Number of fruits		Number of fruits/ 100 flower buds
		Thinned	Picked	
Control	144 b	51 a	187 ab	169 a
Exilis 10 l/ha	185 a	39 a	160 b	111 b
Brevis 1.5 kg/ha	141 b	15 b	115 c	93 b

Planting year: 2002

Planting distance: 3.50 x 1.75 m



Comparison of 6-BA and metamitron

Yield data 2014

Object	Kg/tree	Number of fruits	Fruit weight (g)
Control	34.6 ab	187 ab	185 b
Exilis 10 l/ha	30.7 bc	160 b	183 b
Brevis 1.5 kg/ha	27.2 c	115 c	238 a

Planting year: 2002

Planting distance: 3.50 x 1.75 m



Comparison of 6-BA and metamitron

Fruit quality 2014

Object	Firmness (kg/0.5 cm ²)	Sugar content (°brix)	Starch content (1-10)
Control	6.1	12.2	7.7
Exilis 10 l/ha	6.3	11.8	8.3
Brevis 1.5 kg/ha	5.9	12.5	7.7

Planting year: 2002

Planting distance: 3.50 x 1.75 m



Conclusion

- **Exilis (6-BA)**
 - Started with more flower buds
 - Stronger thinning effect in 2014 than in 2013
 - No positive effect on the fruit size
 - More russeting
- **Brevis (metamitron)**
 - Same number of flower buds
 - Stronger thinning effect than with 6-BA
 - Positive effect on the fruit size (+ 53 grams)
 - Sugar content was not higher
 - No negative effect on the mineral content



Time of application of Brevis





Time of application of Brevis

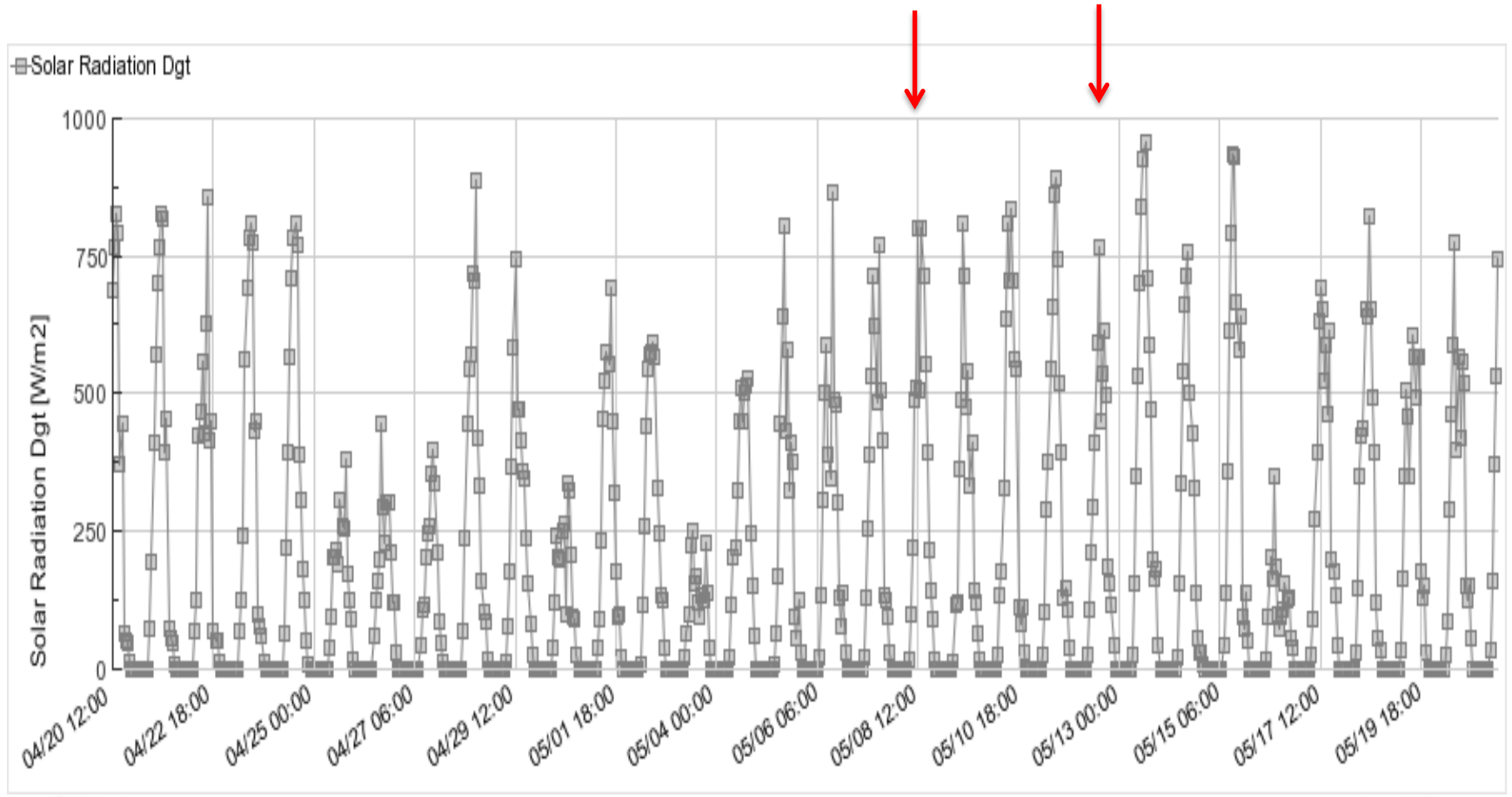
- Variety: Conference
- Planting year: 2002
- Rootstock: Quince Adams
- Planting distance: 3.50 x 1.75 m (1.469 trees/ha)
- Brevis: 1.1 kg/ha at 8 mm and 12 mm





Comparison of 6-BA and metamitron

Solar radiation 2015





Time of application of Brevis

Fruit set 2015

Object	Number of flower buds	Number of fruits		Number of fruits/ 100 flower buds
		Thinned	Picked	
Control	120 a	61 a	207 a	227 a
Brevis 8 mm	122 a	45 a	171 a	181 a
Brevis 12 mm	132 a	56 a	198 a	194 a

Planting year: 2002

Planting distance: 3.50 x 1.75 m





Time of application of Brevis

Yield data 2015

Object	Kg/tree	Number of fruits	Fruit weight (g)
Control	36.2 a	207 a	177 b
Brevis 1.1 8 mm	33.3 a	181 a	196 a
Brevis 1.1 12 mm	33.9 a	194 a	171 b

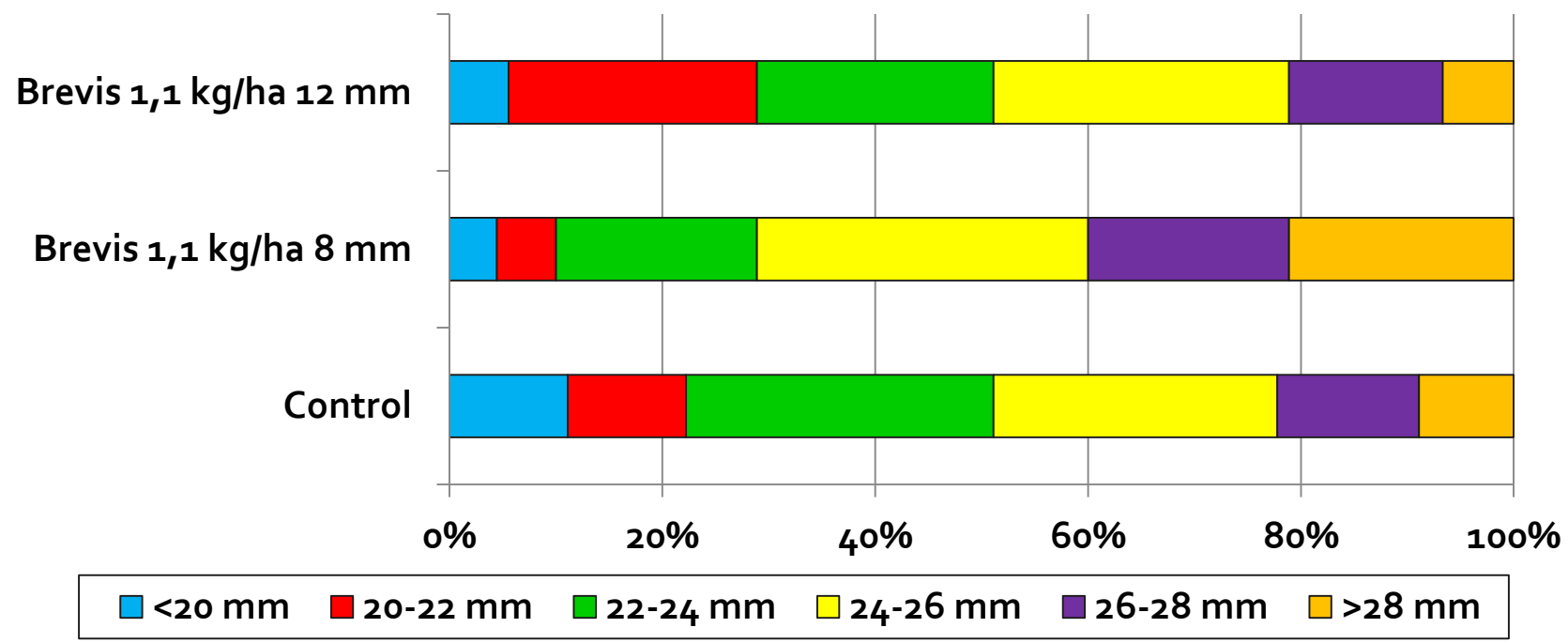
Planting year: 2002

Planting distance: 3.50 x 1.75 m



Time of application of Brevis

Fruit size June 16th 2015



Planting year: 2002

Planting distance: 3.50 x 1.75 m



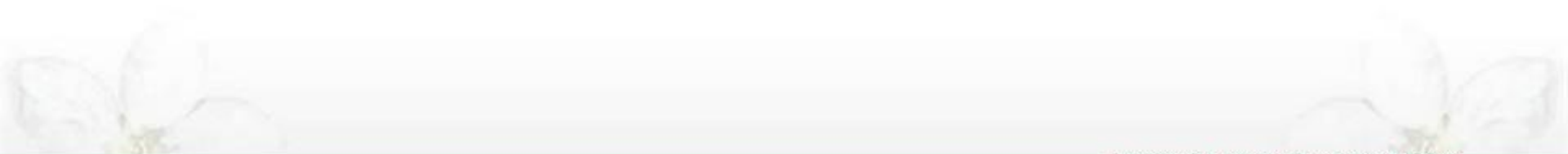
Conclusion

- Slightly stronger thinning effect at 8 mm
- Fruit size was larger (+ 19 grams)
- Already early in the season

- 2014: no difference, but larger fruits at 8 mm
- 2016: stronger at 12 mm
 - Less solar radiation
 - Higher night temperatures
 - But greatest effect on the fruit size at 8 mm



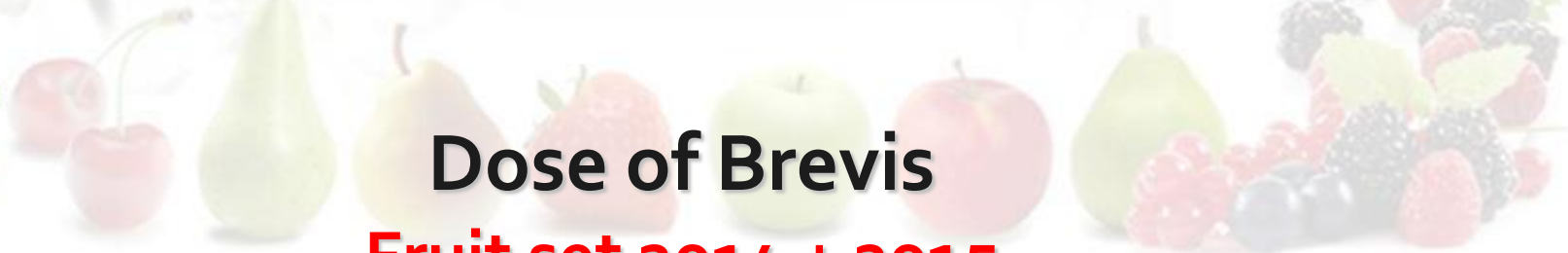
Dose of Brevis





Dose of Brevis

- Variety: Conference
- Planting year: 2002
- Rootstock: Quince Adams
- Planting distance: 3.50 x 1.75 m (1.469 trees/ha)
- 2014
 - 1.5 kg/ha (8 mm) – 2x 1.5 kg/ha (8 + 12 mm)
 - 2.2 kg/ha (8 mm) – 2.2 + 1.5 kg/ha (8 + 12 mm)
- 2015
 - 1.1 kg/ha (8 mm) and 1.5 kg/ha (8 mm)
 - 2x 1.1 kg/ha (8 + 12 mm)



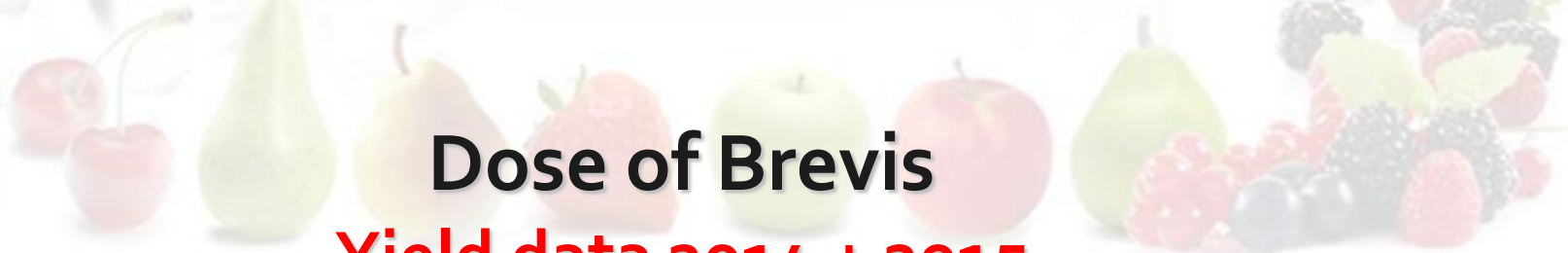
Dose of Brevis

Fruit set 2014 + 2015

Object	Number of flower buds	Number of fruits		Number of fruits/ 100 flower buds
		Thinned	Picked	
<u>2014</u>				
Control	144 a	51 a	187 a	169 a
Brevis 1.5	141 a	15 b	115 b	93 b
2x Brevis 1.5	146 a	10 b	116 b	89 b
Brevis 2.2	153 a	12 b	132 b	94 b
Brevis 2.2 + 1.5	141 a	8 b	112 b	85 b
<u>2015</u>				
Control	120 ab	61 ab	207 ab	227 abc
Brevis 1.1	122 ab	45 bc	171 bc	181 bc
2x Brevis 1.1	142 a	49 bc	182 abc	165 d
Brevis 1.5	98 b	48 bc	162 c	218 c

Planting year: 2002

Planting distance: 3.50 x 1.75 m



Dose of Brevis

Yield data 2014 + 2015

Object	Kg/tree	Number of fruits	Fruit weight (g)
<u>2014</u>			
Control	34.6 ab	187 a	185 b
Brevis 1.5	27.2 c	115 c	238 a
2x Brevis 1.5	26.7 c	116 c	231 a
Brevis 2.2	29.4 bc	132 bc	226 a
Brevis 2.2 + 1.5	25.9 c	112 c	234 a
<u>2015</u>			
Control	36.2 a	207 ab	177 bc
Brevis 1.1	33.3 a	171 bc	196 a
2x Brevis 1.1	34.7 a	182 abc	191 ab
Brevis 1.5	31.9 a	162 c	197 a

Planting year: 2002

Planting distance: 3.50 x 1.75 m



Conclusion

- **2014**
 - Even too strong thinning with 1.5 kg/ha
 - 60 fruits/tree less – 53 grams higher fruit weight
 - 7.4 kg/tree or 11 tons/ha less
 - No stronger thinning or higher fruit weight with 2nd application or higher dose
- **2015**
 - Nice thinning with 1.1 kg/ha
 - Less handthinning – higher fruit weight (+ 19 grams)
 - No difference in fruit weight between 1.1 and 1.5 kg/ha
 - Strongest thinning with 2x 1.1 kg/ha, but no difference in production of fruit size (started with most flower buds)



Brevis after treatments with GA





Brevis after GA

- Variety: Conference
- Planting year: 2002
- Rootstock: Quince Adams
- Planting distance: 3.50 x 1.75 m (1.469 trees/ha)

- Brevis 1.1 kg/ha +/- 3 tablets Gibb 3 (10 % GA₃)
- Brevis 1.1 kg/ha +/- 0,5 l/ha Gibb Plus (10 % GA_{4/7})
- Exilis 10 l/ha +/- 0,5 l/ha Gibb Plus (10 % GA_{4/7})



Brevis after GA

Fruit set 2015

Object	Number of flower buds	Number of fruits		Number of fruits/ 100 flower buds
		Thinned	Picked	
Control	120 abc	61 abc	207 ab	227 abc
Brevis 1.1 kg/ha	122 abc	45 cd	171 bc	181 bc
GA3 30 g/ha	94 c	69 a	190 abc	278 a
GA3 + Brevis	99 bc	57 abcd	182 abc	241 ab
Gibb Plus 0.5 l/ha	119 abc	71 a	218 a	247 ab
Gibb Plus + Brevis	113 abc	40 d	181 abc	201 bcd
Exilis 10 l/ha	139 a	50 bcd	189 abc	176 cd
Gibb Plus + Exilis	131 ab	68 a	217 a	222 bc

Planting year: 2002

Planting distance: 3.50 x 1.75 m



Brevis after GA

Yield data 2015

Object	Kg/tree	Number of fruits	Fruit weight (g)
Control	36.2 a	207 ab	177 bcd
Brevis 1.1	33.3 a	171 bc	196 a
GA ₃ 30 g/ha	34.5 a	190 abc	183 abcd
GA ₃ + Brevis	33.8 a	182 abc	186 abc
Gibb Plus 0.5 l/ha	37.1 a	218 a	169 d
Gibb Plus + Brevis	34.5 a	181 abc	191 cd
Exilis 10 l/ha	32.7 a	189 abc	177 bcd
Gibb Plus + Exilis	37.4 a	217 a	172 cd

Planting year: 2002

Planting distance: 3.50 x 1.75 m

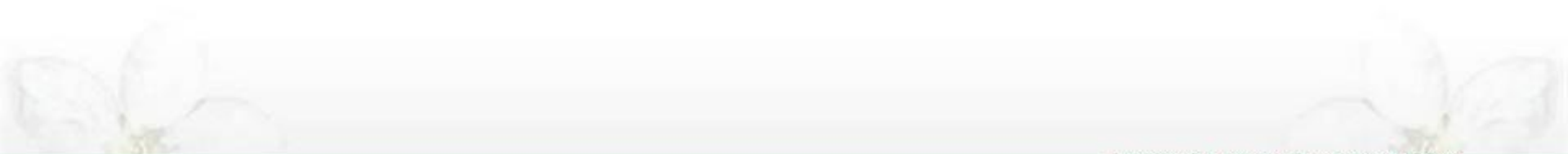


Conclusion

- Treatments with GA = common practice
- Stronger thinning effect with Brevis than with 6-BA (Exilis)
- Better fruit set with GA₃ or GA_{4/7}
- Little thinning effect of 6-BA (Exilis) after treatment with GA_{4/7}
- Less thinning effect of Brevis after treatment with GA₃ or GA_{4/7}, but there still is a thinning effect



Brevis after spring night frost





Brevis after spring night frost

- Parcel of a fruit grower
- Variety: 12 year old Conference
- April 16th 2014: - 2.7 °C

- Finally good fruit set due to parthenocarpy
- Thinning trial
 - 10 l/ha Exilis (8 mm)
 - 1x 1.5 or 2.2 kg/ha Brevis (8 mm)
 - 2x 1.5 or 2.2 kg/ha Brevis (8 + 12 mm)



Brevis after spring night frost

Fruit set + yield 2015

Object	Number of flower buds	Number of fruits	Number of fruits/ 100 flower buds	Kg/tree
Control	232 a	154 a	69 a	29.0 a
Brevis 1.5	238 a	69 c	30 c	16.2 c
2x Brevis 1.5	206 a	26 d	13 d	6.5 d
Brevis 2.2	215 a	57 c	26 c	13.9 c
2x Brevis 2.2	213 a	12 d	6 d	3.5 d
Exilis 10	210 a	103 b	50 b	22.1 b



Conclusion

- Yield was halved with 1.5 kg/ha Brevis
- Stronger thinning with 2.2 kg/ha, but differences with 1.5 kg/ha were not large
- Repeating the treatment was catastrophic, yield dropped at 6.5 and 3.5 kg/tree

- Exilis at 10 l/ha did not cause an overthinning



General conclusion

- Brevis is less dependent to the temperature than 6-BA
- Thinning effect of 6-BA is mostly too weak
- Brevis can give an excessive thinning
- Use 6-BA when a mild thinning is needed
- Use 1x 1.1 or 1.5 kg/ha Brevis when a stronger thinning is necessary
- Optimal time: between 8 and 12 mm
- Not after spring night frost



Thank you for your attention!

