
Scan-Agro
LANDBRUGSMASKINER
Black currant conference
Waldenburg 5th June 2013
www.scan-sprayer.dk

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The Quantum Mist spraying unit

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Timeline and background for the Quantum Mist spraying unit

1992	• Record Grape plantings in Australia and New Zealand in the 1990´s through to 2004 – demand for more efficient application technology
1996	• Work begins in grapes by South Australian Research & Development Institute (SARDI)
1996/97	• A parallel project begins in New Zealand called the Quantum Mist
1997	• Croplands begins to use Quantum Mist fans on their sprayers in New Zealand
1998	• Croplands commercialises the Quantum Mist ø500 fan and brings it to the Australian market
1999	• Export to USA begins
2000	• Croplands take over the Quantum Mist brand & begin commercial production of sprayers. Independent testing undertaken
2002	• New 5-blade fan is developed in conjunction with SARDI
2003	• New fan gives improved coverage results in new testing & Croplands begin large scale production of multi-row grape sprayers to meet market demand
2004	• A new fan cowl is developed to improve the look and functionality of the fan

Timeline and background for the Quantum Mist spraying unit

2005	• New models for apples, citrus and kiwifruit crops are developed
2008	• The 380mm fan is introduced and tested for cool climate grapes
2008	• Export to Scandinavia begins
2009	• Croplands win the Industry Innovation award for the Australian Wine industry. Other export markets begin to develop
2009	• Development and test of a European Quantum Mist sprayer for bush fruit begins
2010	• Further tests in Denmark and delivery of the first commercial machines mainly used in Black current
2011	• Cable-drive project begins with development of single row and row-crop sprayers
2012	• Scan-Agro becomes European distributor for Quantum Mist
2013	• More than 12.000 Quantum Mist heads are now in use world-wide
	• Key markets at the moment (in order of sold units);
	• Australia - New Zealand
	• USA - Mexico
	• Denmark - Argentina
	• UK - South Africa
	• Chile - Germany

European sales strategy

- Own production; Scan-Sprayer – mainly for the Scandinavian market
- Other manufactures (O.E.M)
- Sale for end-user or dealers for retro-fit/upgrade existing sprayers.

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Key benefits of the Quantum Mist

- ***Improved coverage*** using multiple fans instead of one large axial fan
- Turbulent air over a wider swath than conventional axial fans
- Excellent air entry into the back of the fan to produce unimpeded air flow – extremely efficient
- A specifically designed 5-blade propeller (fan blade assembly) for the purpose of spraying vine & tree crops – much more efficient that existing designs.
- ***Rugged design*** – the polyethylene cowl has proven very robust
- ***Extremely simple design and easy to install***
- ***Lower power requirements - reducing fuel*** use and cost – up to 40-50% saving (and lower carbon footprint)
- Available now in both hydraulic and cable drive
- **Allows faster travel speeds** for spraying as well as **lower application rates**
- ***Reduced drift*** with directional fan capability – targeted application
- Multiple nozzles per fan much closer to the target than conventional axial fans
- Highly adjustable bracket & clamp design
- ***Well proven*** – both by independent, scientific tests and in practice use

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Calculations on cost savings

BREAK DOWN COMPARISON

The comparison chart clearly demonstrates the economic breakdown of using either configuration of the two leading industry brands. It does not take into consideration many of the other less quantifiable benefits outlined in this document, for the purpose of estimating the total cost per season. We have assumed the property is 100 hectares and it would be sprayed a total of 10 times.

This allows easy conversions to actual vineyard sizes and number of spray rounds per season comparisons.

Values are approximate, based on modelling.*

	2000 L SILVAN 2 ROW	2000 L SILVAN 3 ROW	2200 L QUANTUM 3 ROW	3000 L QUANTUM 3 ROW
Estimated Fuel and Tractor cost per application	$1,642.20	$1,406.00	$1,120.5	$774.14
Estimated Fuel and Tractor cost per season	$16,422.00	$14,060.00	$11,205.00	$7,741.44
Work rate hectares per hr	2.1	2.6	2.4	3.5
Time to spray the property per application (hours)	47.6	38.0	41.5	28.8
Time to spray the property per season (hours)	476.0	380.0	415.0	288.0
Labour costs to spray the property	$1,142.40	$912.00	$996.00	$691.20
Labour costs per season	$11,424.00	$9,120.00	$9,960.00	$6,912.00
Sprayer cost's per spray round	$142.80	$114.00	$124.50	$86.40
Sprayer costs per season	$1,428.00	$1,140.00	$1,245.00	$864.00
Total costs to spray the property per spray round	$2,931.20	$2,416.60	$2,235.00	$1,551.40
Total cost to spray the property per season	**$29,312.00**	**$24,166.00**	**$22,355.00**	**$15,514.00**

*Calculations derived from field work assuming typical operating conditions.

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Quantum mist are used in many different crops

- Wine and table grapes
- Citrus – mainly Oranges
- Apples and pears
- Stonefruit – peaches and cherries
- Blueberries
- Blackcurrants – raspberries - boysenberries
- Rosehips
- Vegetables
- Mangoes
- Kiwifruit
- Macadamias
- Avocadoes

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Quantum mist are used in many different crops

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Quantum mist are used in many different crops

Background for the Danish work in black current

Danish black current growers were looking for;

- **improved coverage**
- **higher capacity**
- **reduced noise**
- **potential savings**
    - **fuel**
    - **running costs**
    - **maintenance ect.**

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Experimenting with different designs and settings – 3 heads

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Experimenting with different designs and settings – 4 heads

Experience after the first tests

- QM unit over the row is important to get full penetration
- 150-200 l/ha gave satisfactory deposit compared to conventional application technology
- Design complicated for multiple row sprayers
- Visually less drift
- Forward speed 6 – 9 kph
- Some areas on the outer canopy don´t get full coverage
- Conventional nozzles could improve coverage in the outer parts

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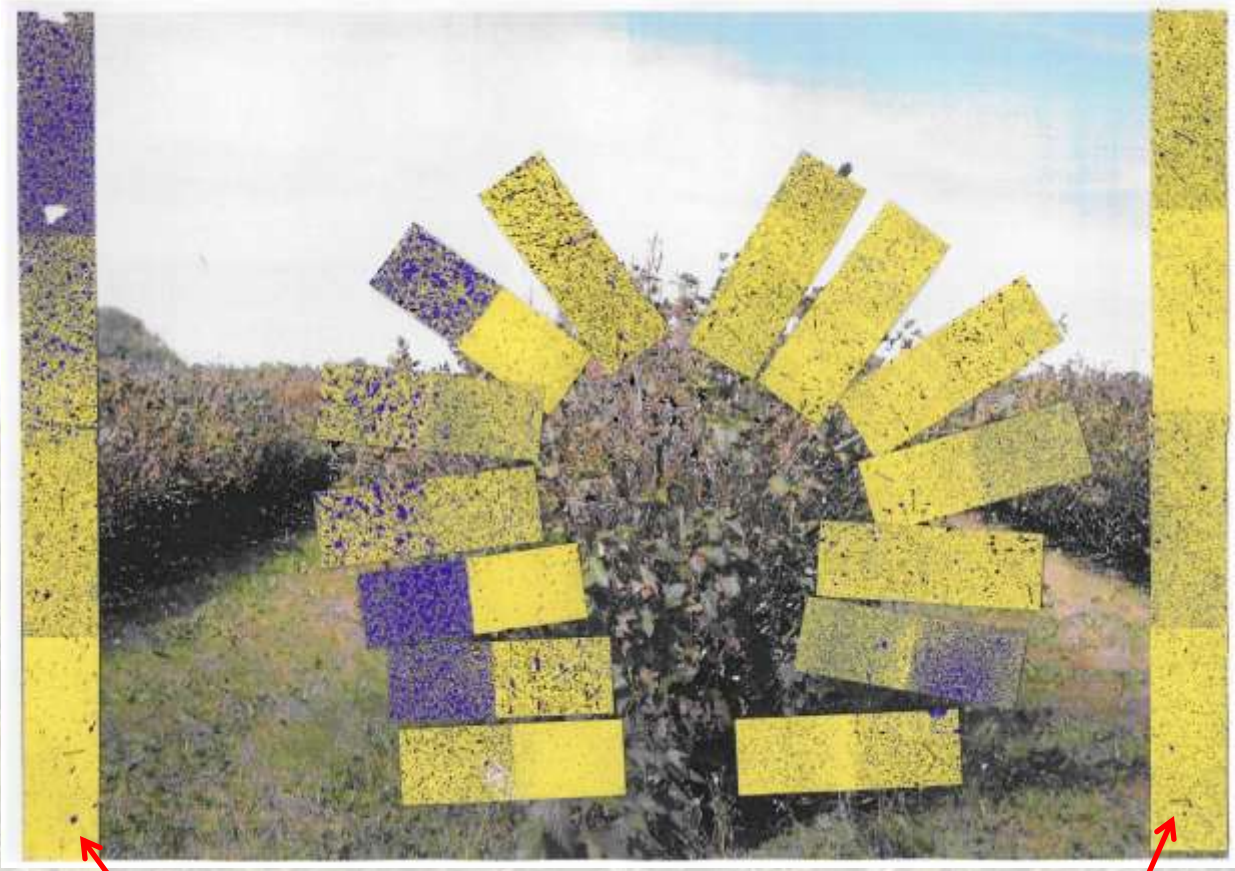
Some results – 3 heads + injector nozzles

3 pcs. injector nozzles added - no additional nozzles



Pins positioned in the middle of the bush during spraying

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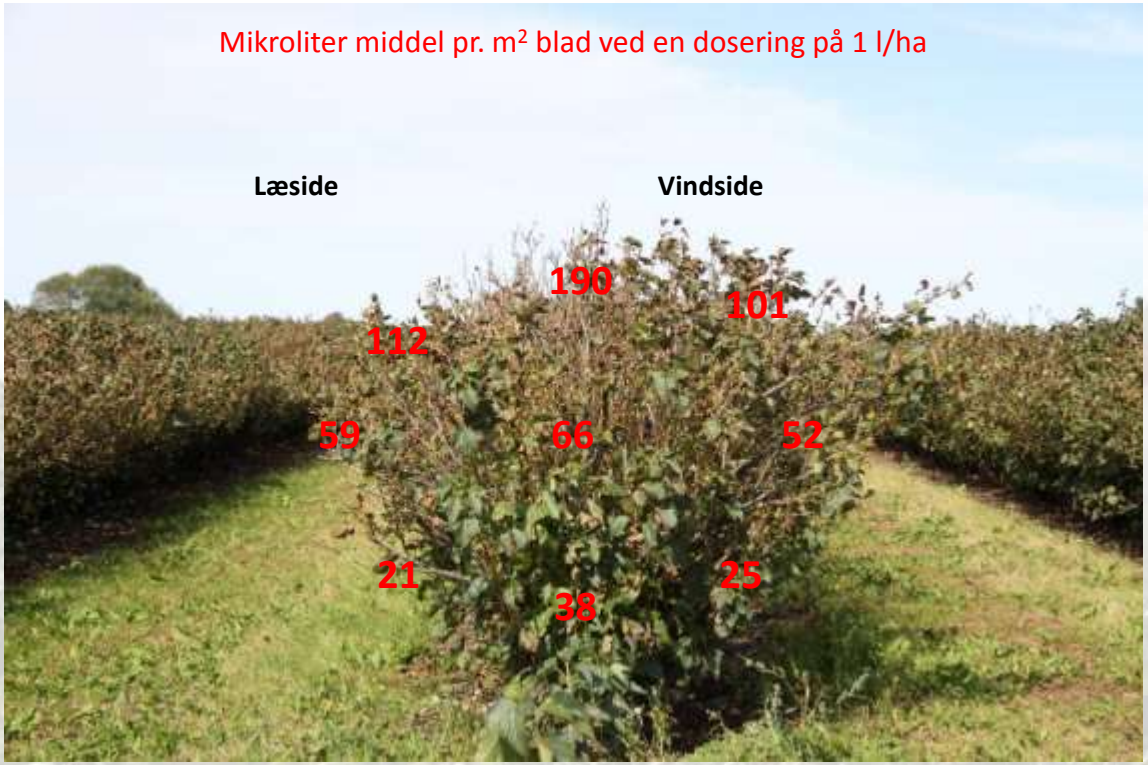
New design after discussions with Geoff Furness, Sardi

New design after discussions with Geoff Furness, Sardi

- Less complex folding of multiple row sprayers
- Strong penetration and turbulence in the canopy;
    - “spraying inside-out”
    - deposit right down to ground level
- Possible to travel faster
- Adding droplegs to cover the outer parts of the bush (can be delivered in two lengths)
- Be careful not to use too much air – feel the crop move in the wind.....

Some results – deposit



Some results – deposit at 9 positions

Wind mid leeward

Top

Middle

Bottom

Left; upperside
Right; lowerside
of leaf

Deposit at both
Lower and upper
side of all leaves.

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Some results – deposit

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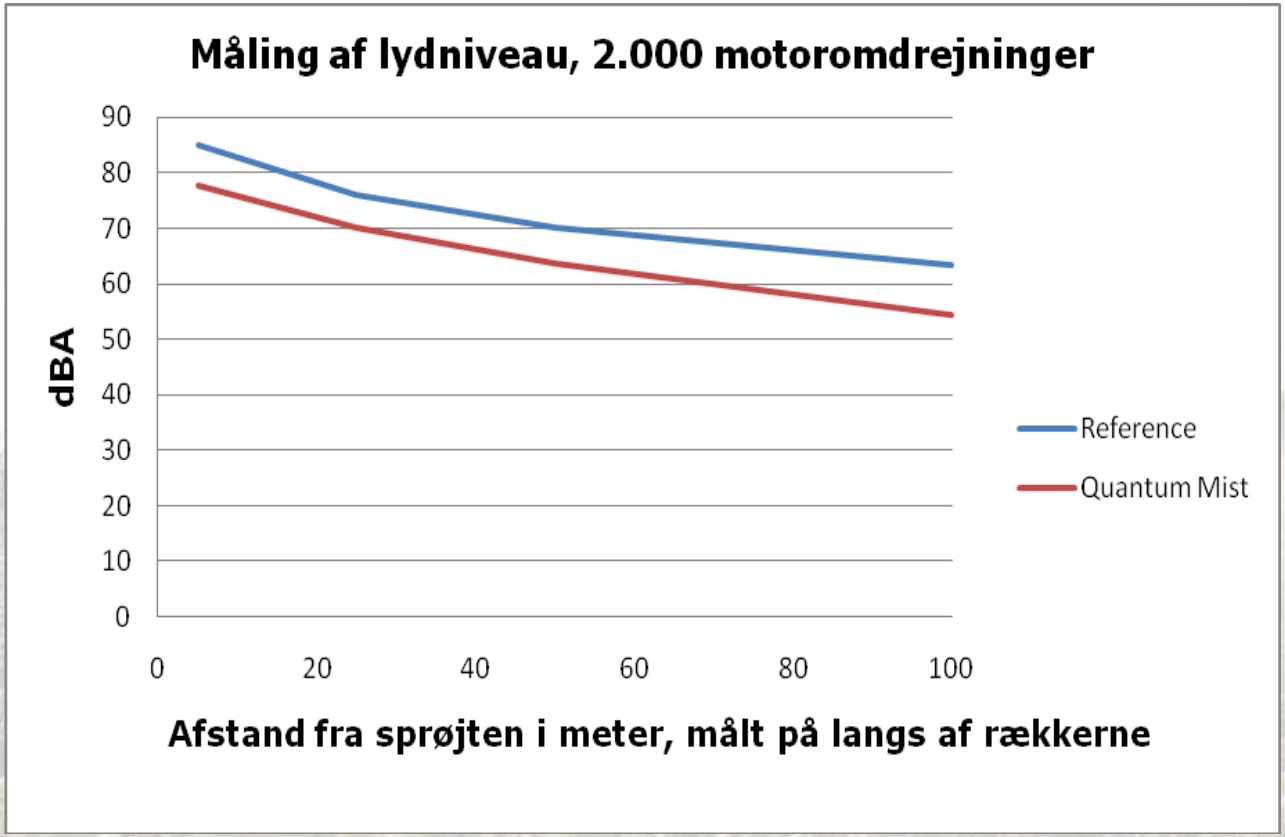
Some results – noise level
comparing QM and conventional mistblower in Black-current



Subjective; less annoying sound

An increase of 10 dB doubles the noise intensity !!

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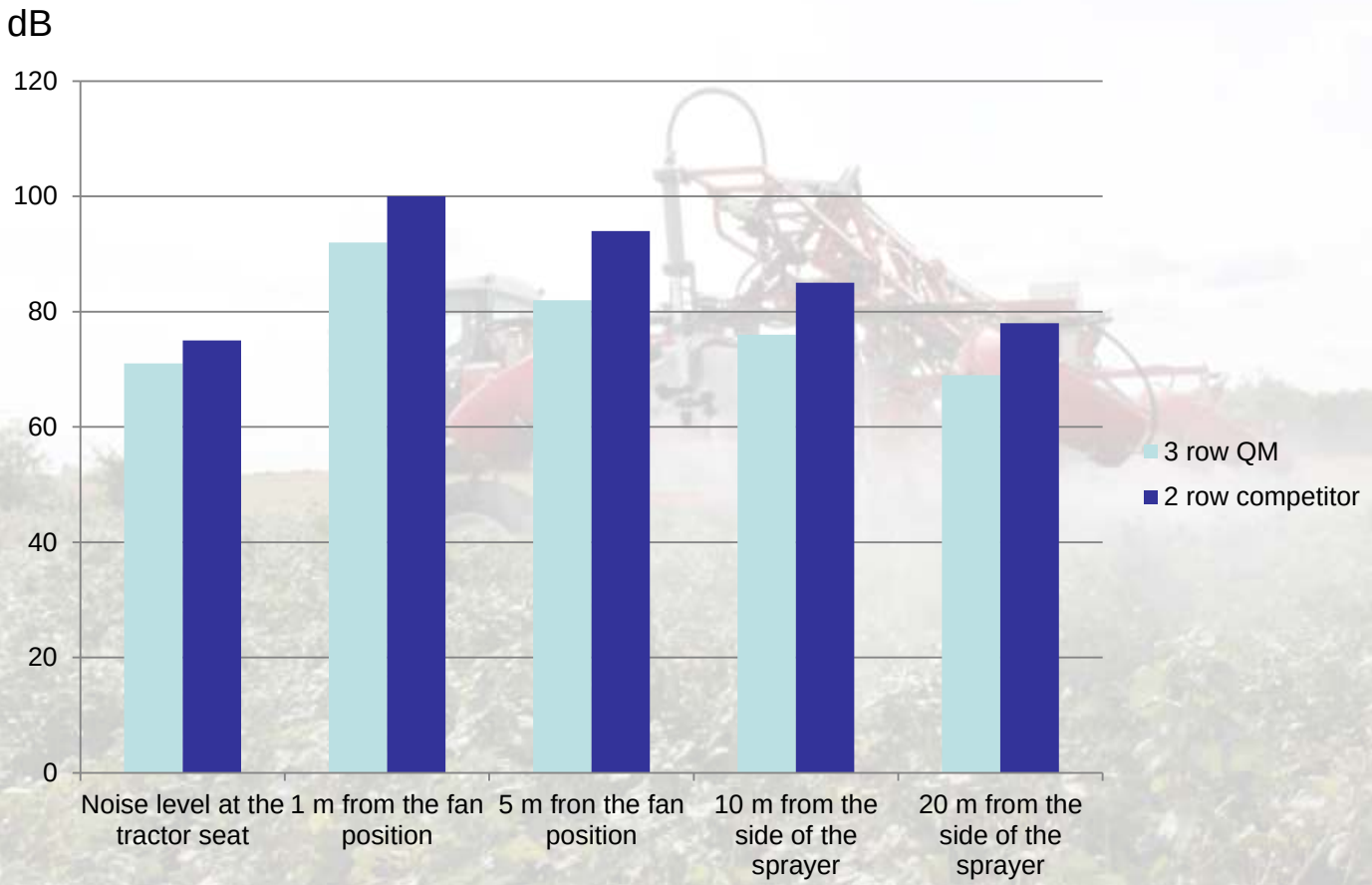
Noise level in Vineyard – New Zealand



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Final design – 7 row selfpropelled – 4000 litre

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Final design – 2 row trailed – 1500 litre

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Final design – 2 row trailed – 2000 litre

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Final design – 4 row trailed in development

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For more information;

www.croplands.com.au

http://www.croplands.com.au/pages/horticulture.html

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Any questions ??

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Thank you for your attention