
WAVE. All things considered,
the best in weed control
Perth, 15 May 2015

Worldwide developments of Wave

- General trend of leaving chemical use;
- Article The Lancet;
- European market is speeding up: NRW/DE per 1.1.2015, Belgium per 1.1.2015, Netherlands March 2016; France per 2020;
- Competition is coming from cleaning/high pressure industry: knowhow?;
- In manual carrier driven market large competition;
- Focus on European market until end of 2016;
- Focus on Canada and Australia from 2016;
- Focus on US from 2018.

Thermal method

Principle:

- Lethal tissue temperature: 58 C (visual damage: necrosis, dehydration)
- Sublethal T < 58 C : growth suppression; disruption of cell functionality (non visual)

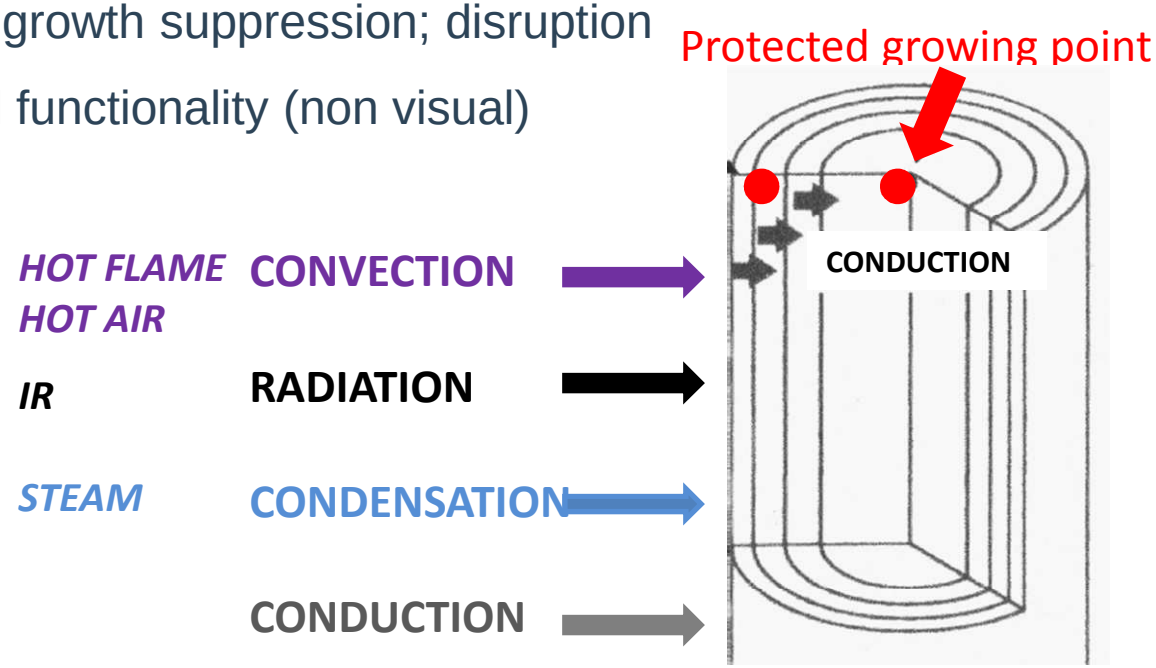
Formula:

Heat transfer (Q) =

Surface area of leaf x

Δ temperature x

heat-transfer coefficient

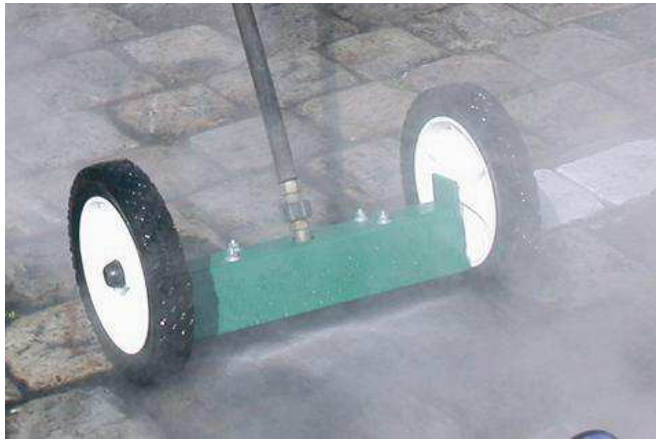


Conductive heat transfer

- Hot water machine
- Steam machine

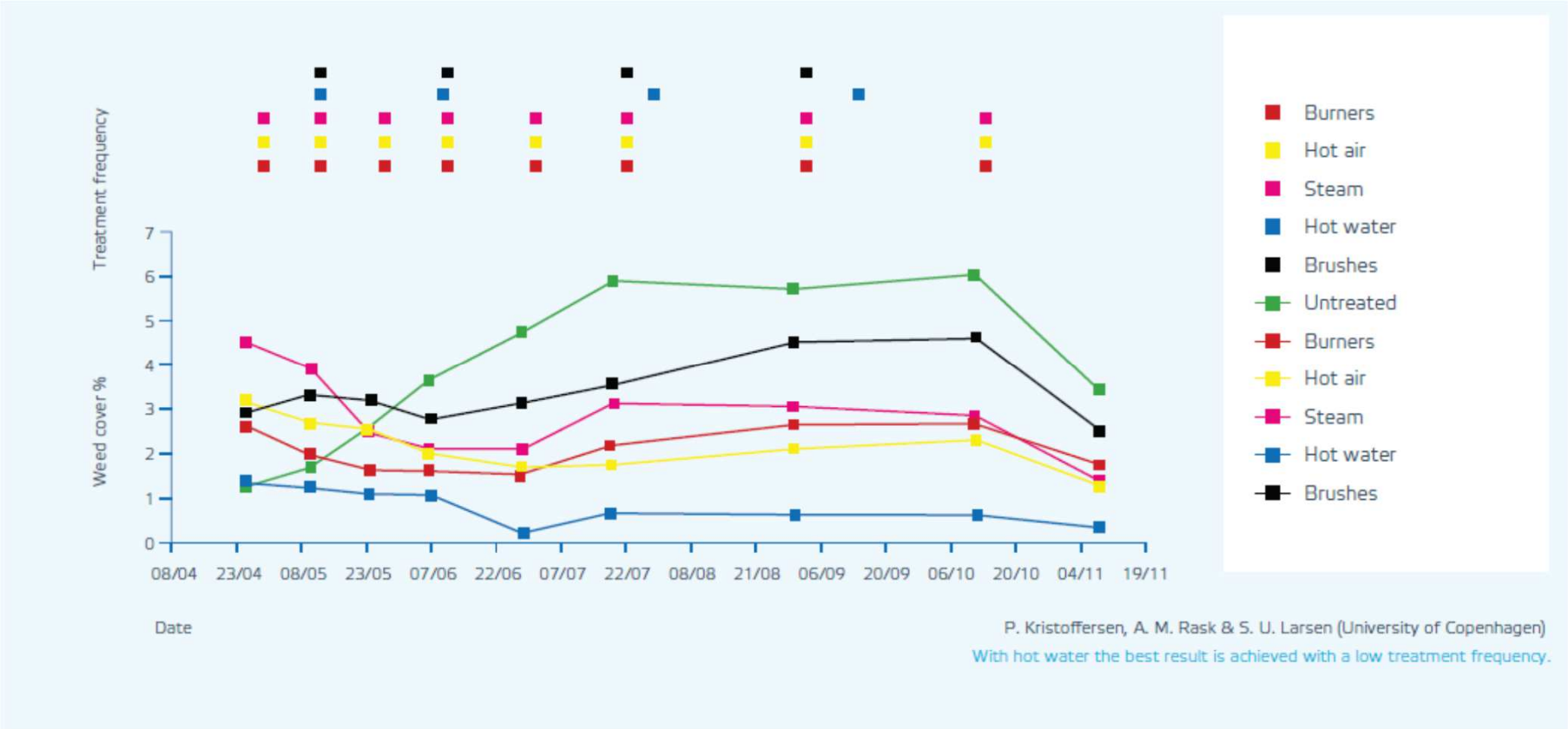
	Specific heat capacity kJ/kg K		Heat-transfer coefficient W/mK	Specific energy kJ/kg
HOT AIR	(100°C, 1 bar)	1.01	0.030	101
WATER	(100°C, 1 bar)	4.18	0.682	418
STEAM	(100°C, 1 bar)	2.08	0.025	2674

ΔT is small "Water is a good conducter and has a high specific energy"



Which timing?

- Graph Kristoffersen



6.2. Which technique?

	Chemical	Mechanical	Burning	Hot air	WAVE hot water
Environmental impact	X Very high	√ Moderate	√ Moderate	X High	√ Low
Surface	√ Any surface	X No porous or soft surfaces	X No flammable surfaces	X No flammable surfaces	√ Any surface
Health and safety	X Protective clothing needed against chemicals	X Hearing and dust protection needed	X Protective clothing needed against heat	X Protective clothing needed against heat	√ No protective clothing needed
Noise	√ Little noise	X High noise level	√ Little noise	√ Little noise	√ Little noise
Applicability	X Not permitted everywhere	X Not suitable for use around lamp posts and obstacles	X Less suitable for use around lamp posts and obstacles	X Less suitable for use around lamp posts and obstacles	√ Suitable for touch ups with hand lance
Surroundings	X Undesired damage to adjoining greenery. Cannot be used in water-collection area	X Undesired wear to pavement, residual metal particles and rust patches	X Undesired damage to adjoining greenery	X Undesired damage to adjoining greenery	√ Directed weed control without damage to the surroundings
Energy consumption	√ Low	X Higher than WAVE	X Much higher than WAVE	X Much higher than WAVE	√ Low
Activities	X Resistant weed species survive	X Mows away foliage, rapid regrowth	X Damages the foliage. No effect on the roots	X Damages the foliage. No effect on the roots	√ Kills the plant as well as the roots
Effectiveness	√ Depending on the dosage, very high (2 to 3 treatments per year)	X Low (5 to 10 treatments per year)	X Low (4 to 8 treatments per year)	X Low (5 to 10 treatments per year)	√ High (2 to 6 treatments per year)
Particulars	X Socially unaccepted. Requires certification and strict legislation	X Requires sweeping afterwards	X Cannot be used during extreme drought	X Cannot be used during extreme drought	√ No resistant weeds. Suppresses weeds. Also cleaning work can be done with hand machines

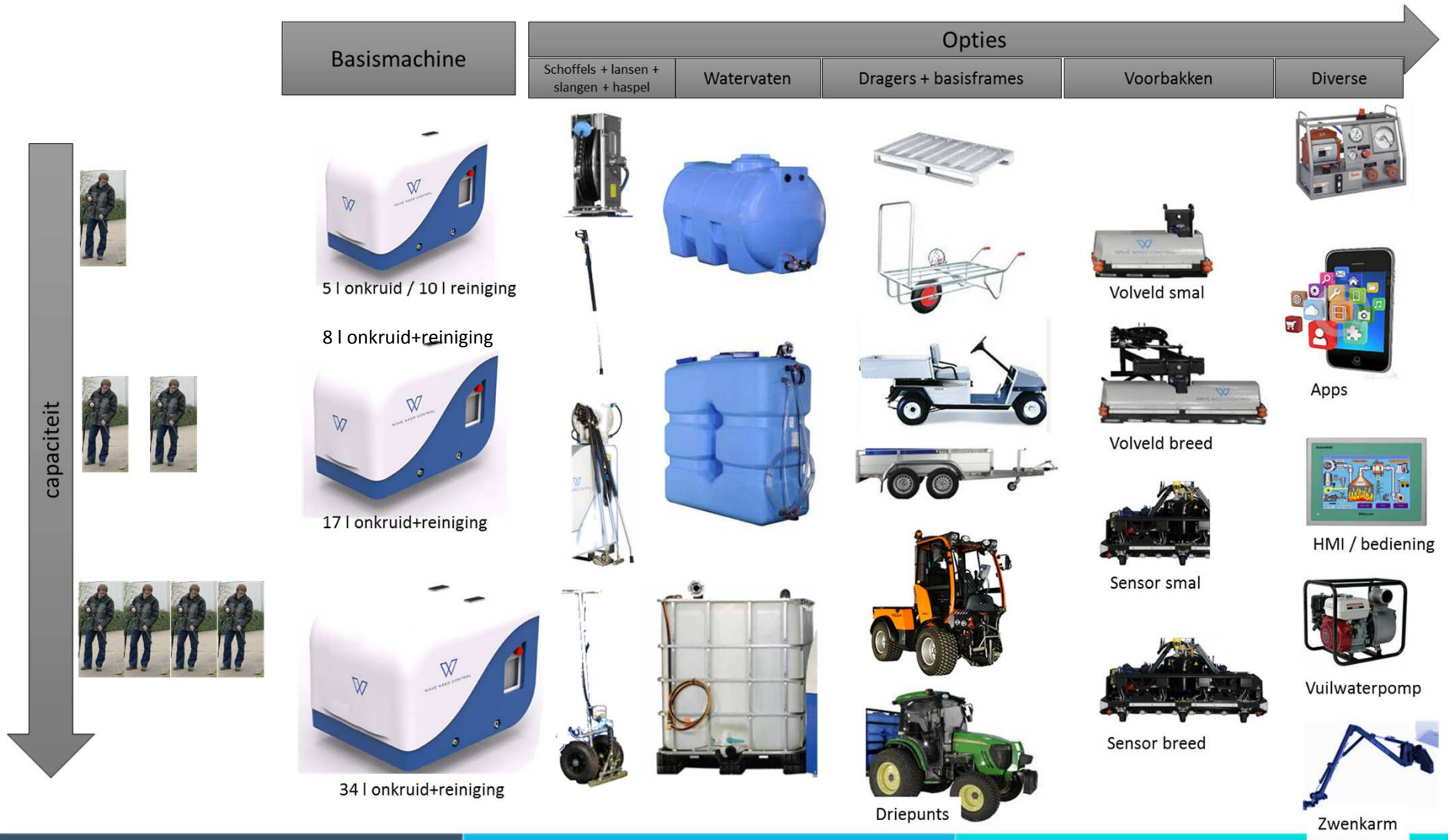
WAVE new productportfolio

What will you get:

Complete portfolio which can compete with all the competitors in all the countries

- Design;
- Touch screen;
- Cleaning possibility;
- Different power: motor /220 Volt / 110V/ 12-24 V;
- Hybrid, electrical;
- Lowest TCO and investment;
- Less spare parts;
- Easy to work with: member of the Wave Family.

WAVE new portfolio development



Invasive Species

- Research results;
- Translation into practical manuals;
- Expectation pattern by type;
- Training Model;

Co operationship with universities in Europe and North America

To bring right solution into the market.

WAVE Academy

Two Levels

Level 1:

Sharing Knowledge between the countries

Level 2:

- Education training for customers; engineers, project managers, engineers. Conforms to current policy.

- WAVE Academy product trainings:
  Aim to create more understanding and more market opportunity for WAVE philosophy and productportfolio

- Process Q4 2015

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WAVE WEED CONTROL