

# Melgreen



Red seaweed based biostimulant for high turf quality



Improve turf growth



Improve turf resistance



Strengthen the turf

# Plan of the presentation

## 1-SEATECH Technology (red seaweed)

## 2-Melgreen Range

- Melgreen Mn
- Melgreen Si
- Melgreen Cu
- OCEAMAX



National Golf in St Quentin-en-Yvelines (France) - 2018 Ryder Cup homepage

## 3-Trial Results

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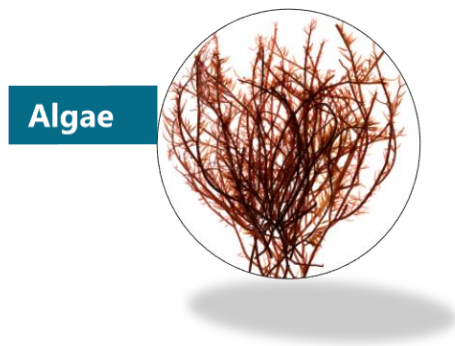
## 3-Trial Results

# SEATECH TECHNOLOGY

Melgreen range is based on a unique technology developed by Olmix Research Center: SEATECH



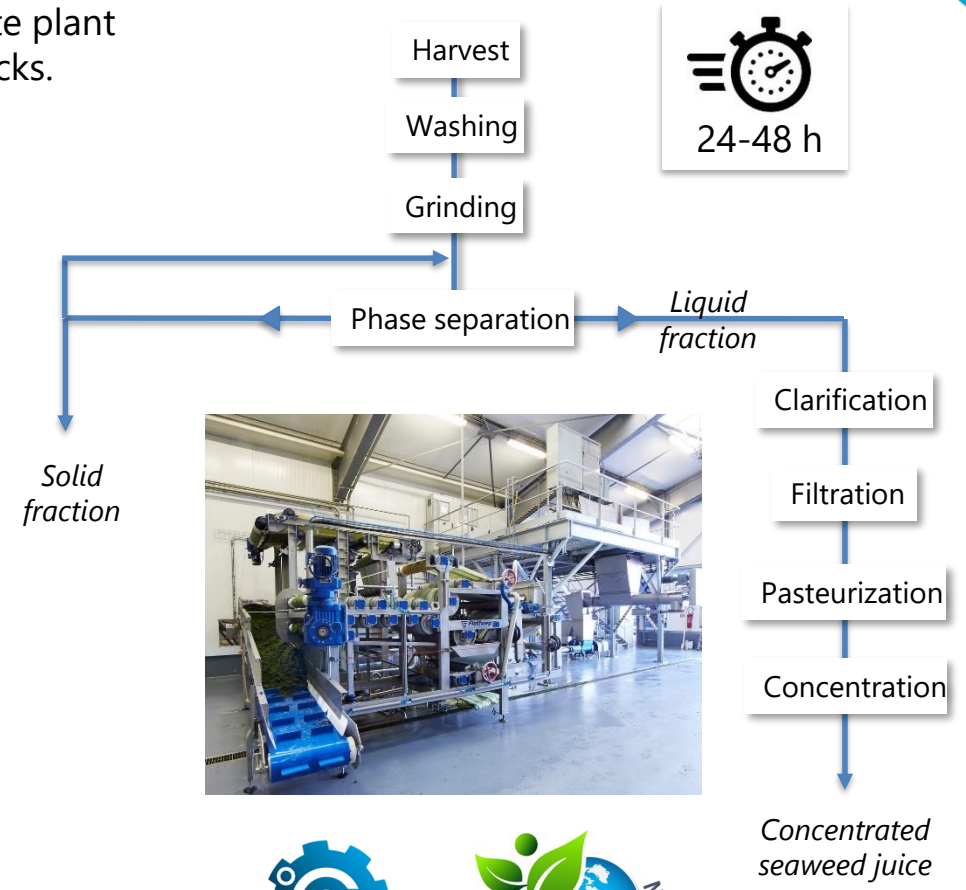
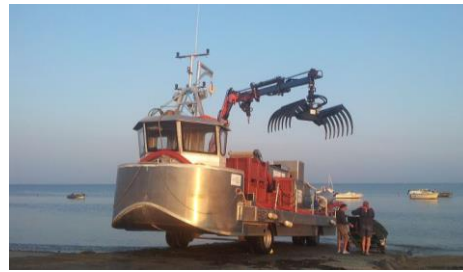
SEATECH concentrates specific nutrients and active components from red seaweed collected on Brittany coast.



# SEATECH TECHNOLOGY



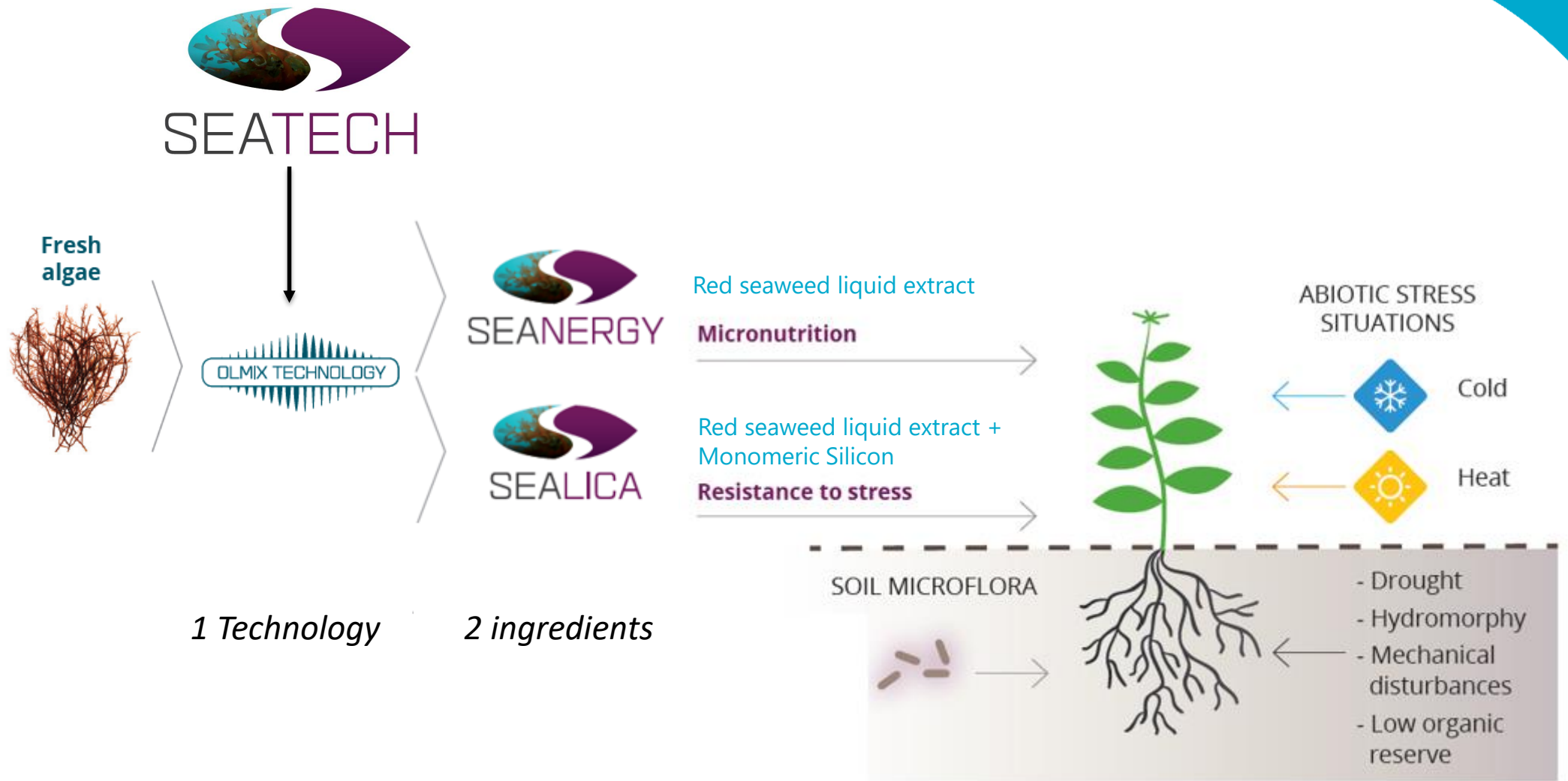
Extraction and capturing value out of nutrients and active substances from algae to stimulate plant growth and the ability to withstand attacks.



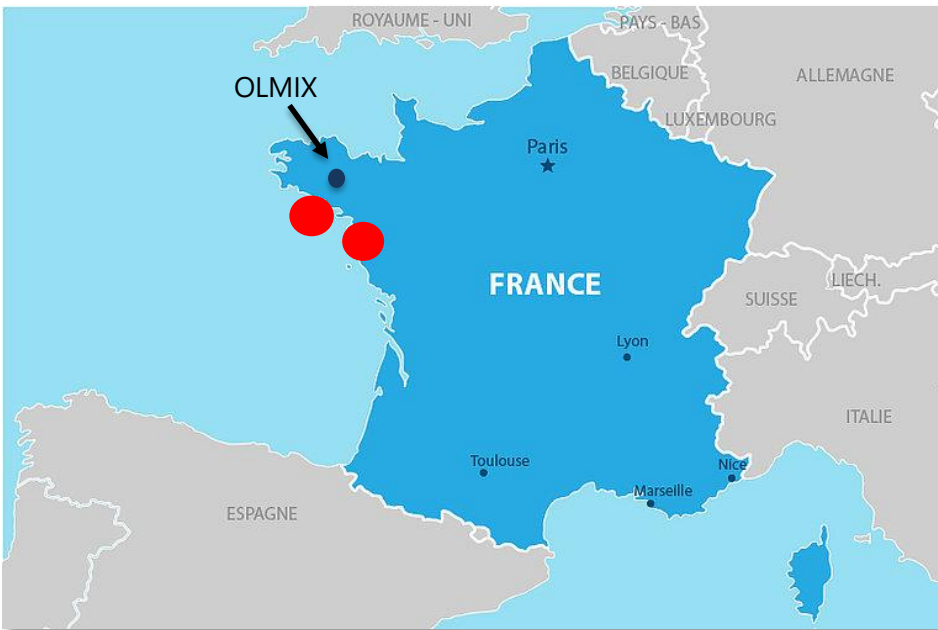
	Red algae	Brown algae	Green algae
Minerals and micronutrients	+++	++	++
Carbohydrates	+	++	++
Proteins	++	+	++
Sulphated polysaccharides	Carrageenans	Fucoidans	Ulvans



# SEATECH TECHNOLOGY



# Solieria chordalis



Olmix harvest *Solieria chordalis* in west coast of France.

It is an annual seaweed growing between 2 and 8 meters deep in the ocean

In summer, the content of nutrients and active substance increase in the seaweed. Its weight increases and the seaweed comes loose from seabed and arrives on Britany coast.



# ACTIVE MOLECULES OF SOLIERIA

## Antioxidants

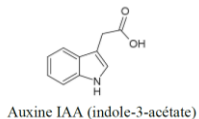
Pigments, polyphenols, vitamins

- ❖ Cell detoxification

## Phytohormones

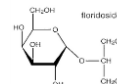
Auxins, cytokines, salicylic acid

- ❖ Root growth development
- ❖ Growth stimulation
- ❖ Apparition of development stage



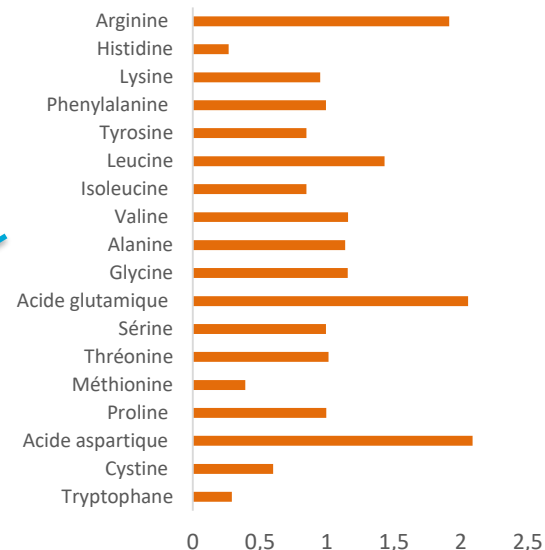
## Osmoprotector

Small size sugar

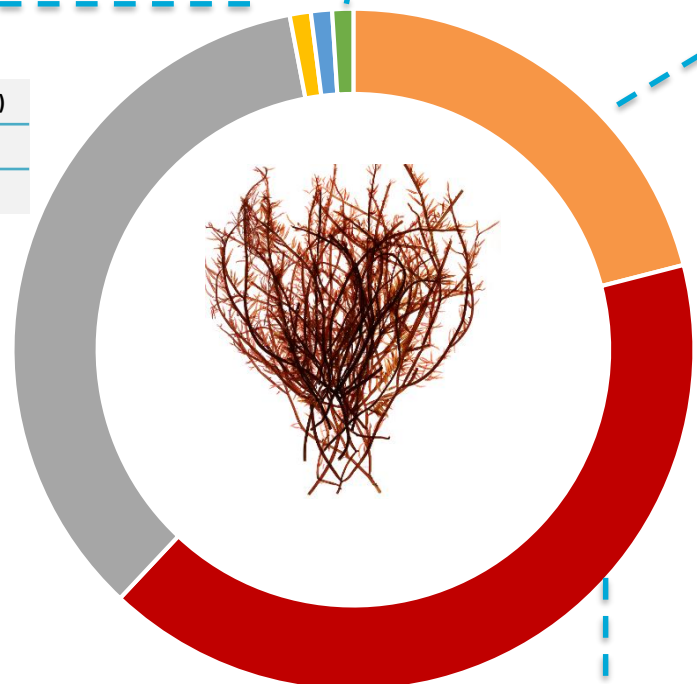


- ❖ Resistance to hydric stress
- ❖ Frost Resistance

## Amino acids (% dry matter)



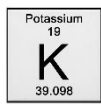
	Content ( on DM)
Average of auxins IAA in seaweed (Craigie, 2010)	0,1 mg/kg
Average of auxins IAA in SEATECH	2mg/kg



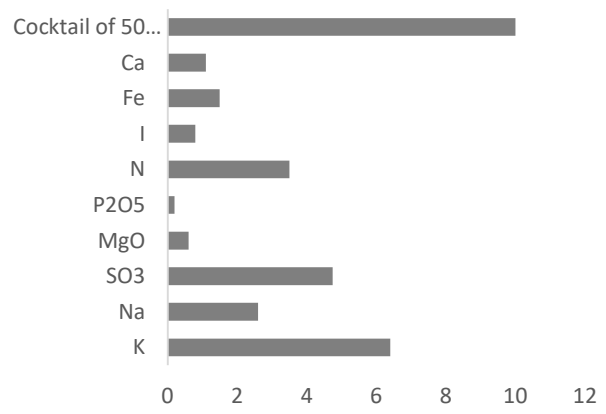
## Polysaccharides like carrageenan



- ❖ Stimulation of plant growth (photosynthesis, cell division)
- ❖ Résistance against stress (stimulation of natural defenses)
- ❖ Complexation of nutrients thanks to sulfate group



## Nutrients (% dry matter)



- ❖ Nutrition



# Efficacy of different seaweed extract

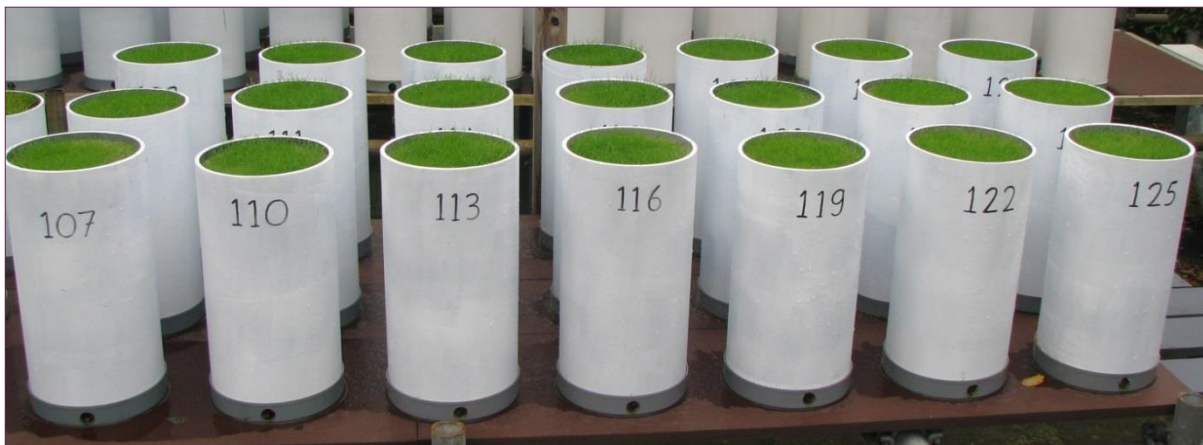
## Comparison of the effect on different seaweed extract on turf growth

Research Institute of Lumbricus-2015

- Lumbricus BV
- Herveld-The Netherlands
- Pot trial
- Mix 3 different species of *Agrostis stolonifera*
- 3 replicates per modality - 4 modalities
- 4 applications

Tested programs	08/09	25/09	14/10	01/11
Control untreated	/	/	/	/
Red seaweed	3 L/ha	3 L/ha	3 L/ha	3 L/ha
Brown Ascophyllum	1,5 kg/ha	1,5 kg/ha	1,5 kg/ha	1,5 kg/ha
Brown Ecklonia	2l/ha	2 L/ha	2 L/ha	2 L/ha

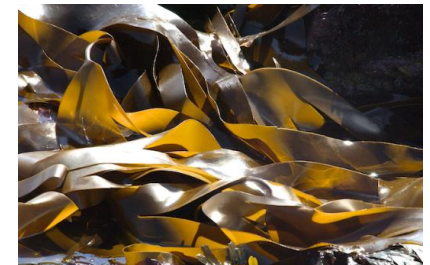
Water volume of spray : 250l/ha



Red seaweed: *Solieria chordalis*



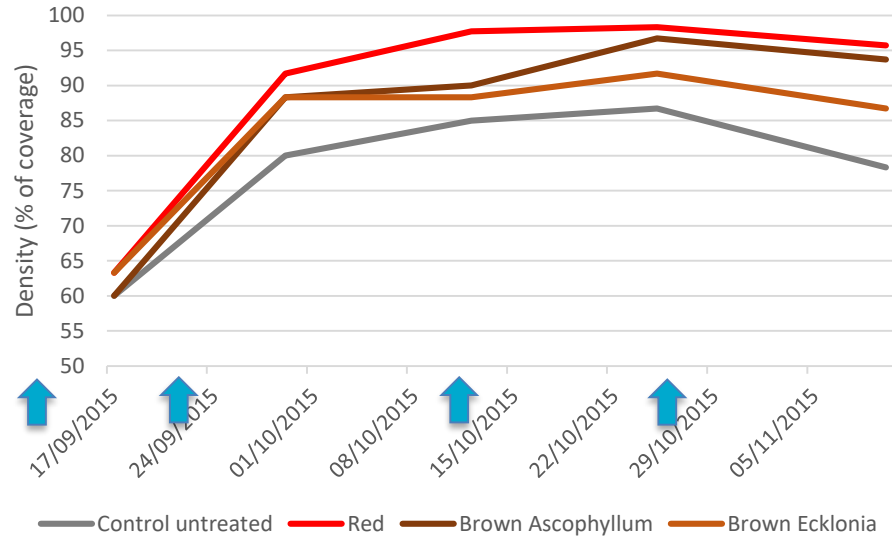
Brown seaweed : *Ascophyllum Nodosum*



Brown seaweed: *Laminaria digitata*

# Efficacy of different seaweed extract-Results 1/3

## Turf coverage



## Vegetative Biomass

September 17th

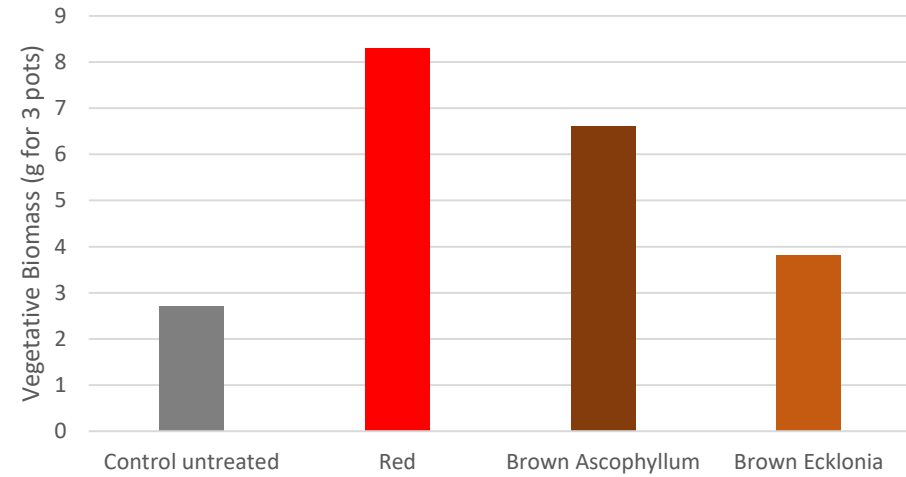


Photo 3.2 Control at 12-10-2015

Photo 3.3 Product R at 12-10-2015

**Control**

Picture on 12-10-2015

**Red seaweed**

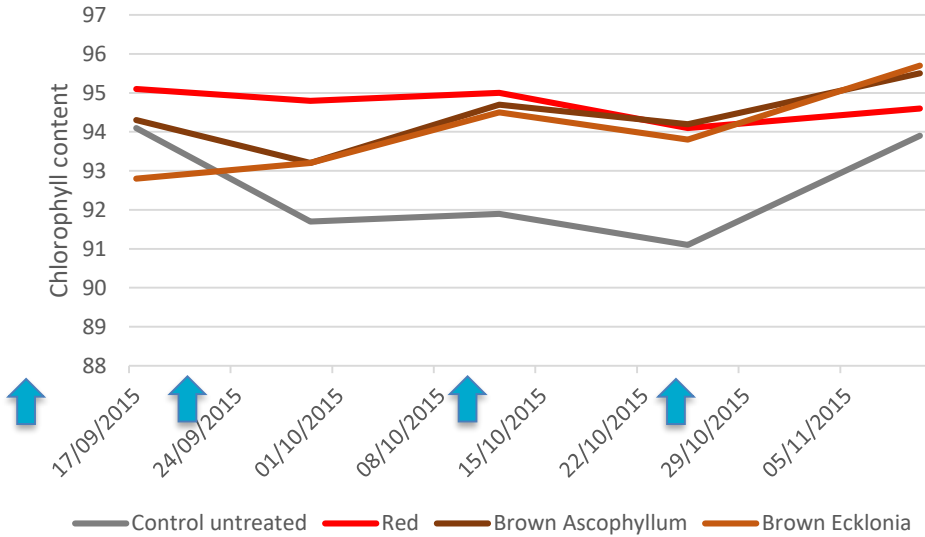


Control    XXXXXXXXX    Red Solieria    XXXXXXXXX    Brown Ascophyl    Brown Ecklonia

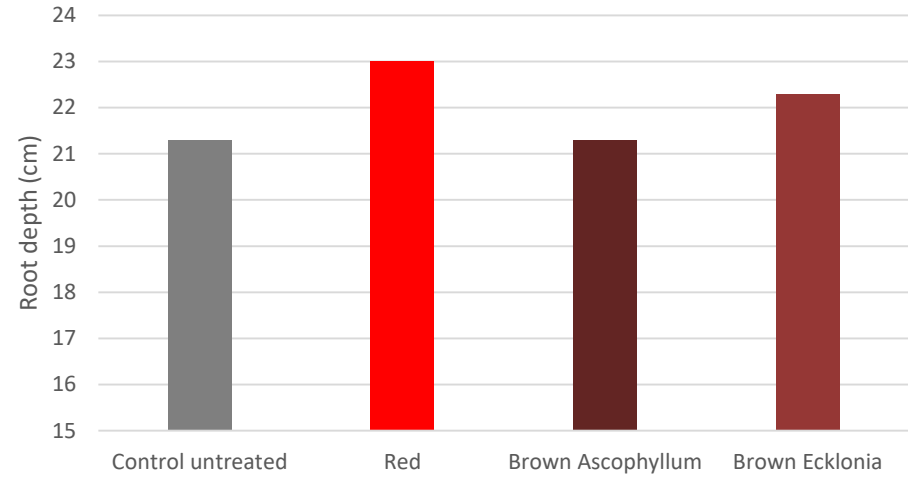
**Biomass on September 17th**

# Efficacy of different seaweed extract-Results 2/3

## ▶ Photosynthetic activity



## ▶ Root development 10/11/2015



Control 3

*Control*

Picture on 10-11-2015



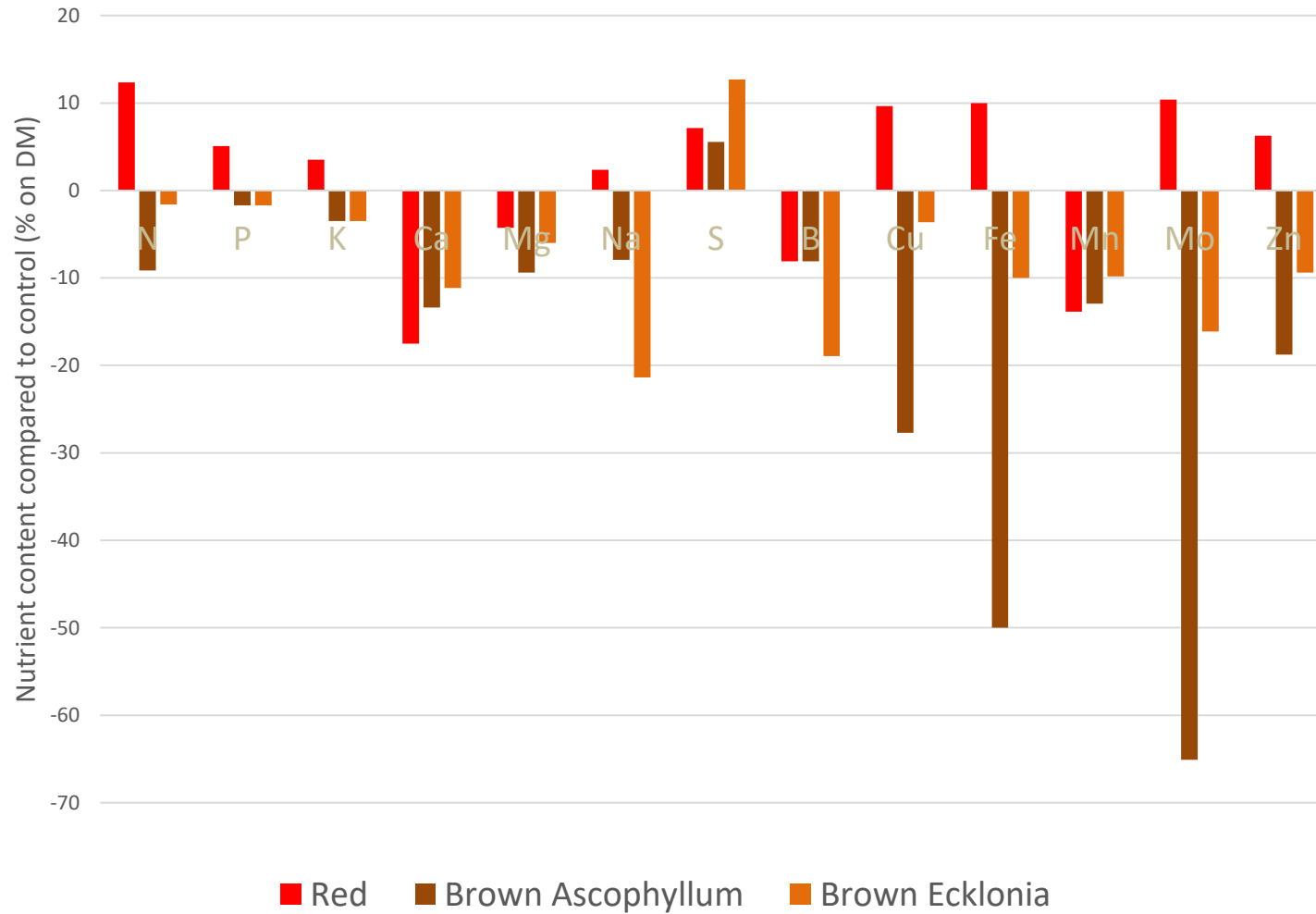
R1

*Red seaweed*

# Efficacy of different seaweed extract-Results 3/3

## ► Nutrient uptake

Leaves analysis at the end of the trial on 15th November



# Plan of the presentation

1-SEATECH Technology (red seaweed)

## 2-Melgreen Range

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- Melgreen Cu
- OCEAMAX



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3-Trial Results

# Melgreen Mn



7,5% Mn  
13% SO3



<b>Targeted crop</b>	Turf
<b>Dosage</b>	3l/ha
<b>Timing</b>	Every 3 to 4 weeks from March to October
<b>Usable in organic farming</b>	YES
<b>Packaging</b>	5 L
<b>Regulation</b>	EC Fertilizer

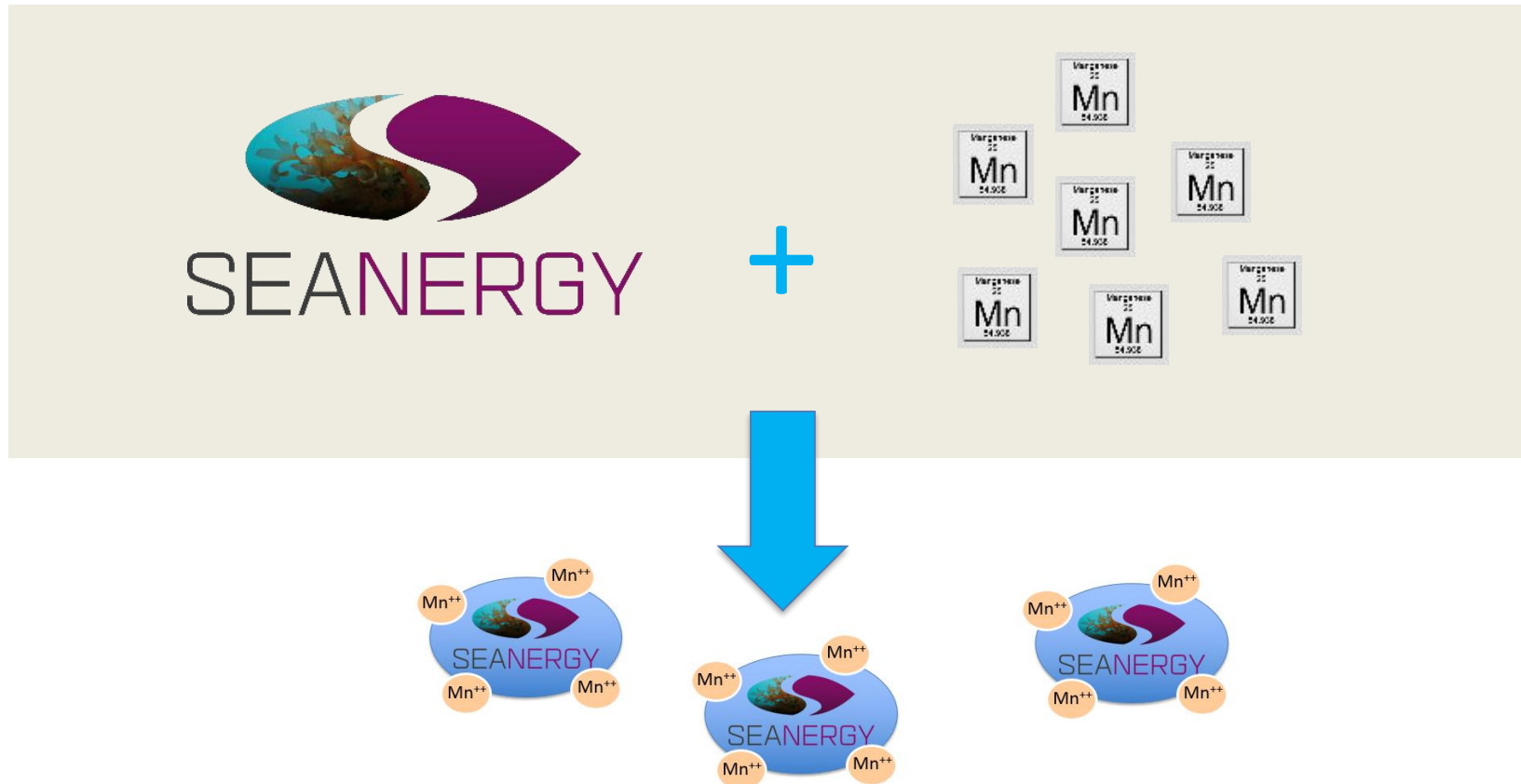
1-Stimulation of root growth  
2-Stimulation of photosynthesis and carbohydrate synthesis

- Better uptake of nutrients
- Better growth of the plant
- Faster green up of the turf



# Melgreen Mn

## Association SEANERGY with trace elements



→ Complexation of trace elements with sulfated polysaccharides (carrageenans) and amino acids for an optimised penetration through the leaf

# Melgreen Si



Trace elements  
Boron (B)-3,3 g/L  
Copper (Cu)-8,8 g/L  
Manganese (Mn)-6,6 g/L  
Zinc (Zn)-6,6 g/L



Seaweed extract  
+ Monomeric silicium

<b>Targeted crop</b>	Turf
<b>Dosage</b>	3-5l/ha
<b>Timing</b>	Every 3 to 4 weeks from April to October
<b>Usable in organic farming</b>	YES
<b>Packaging</b>	5 L
<b>Regulation</b>	EC Fertilizer

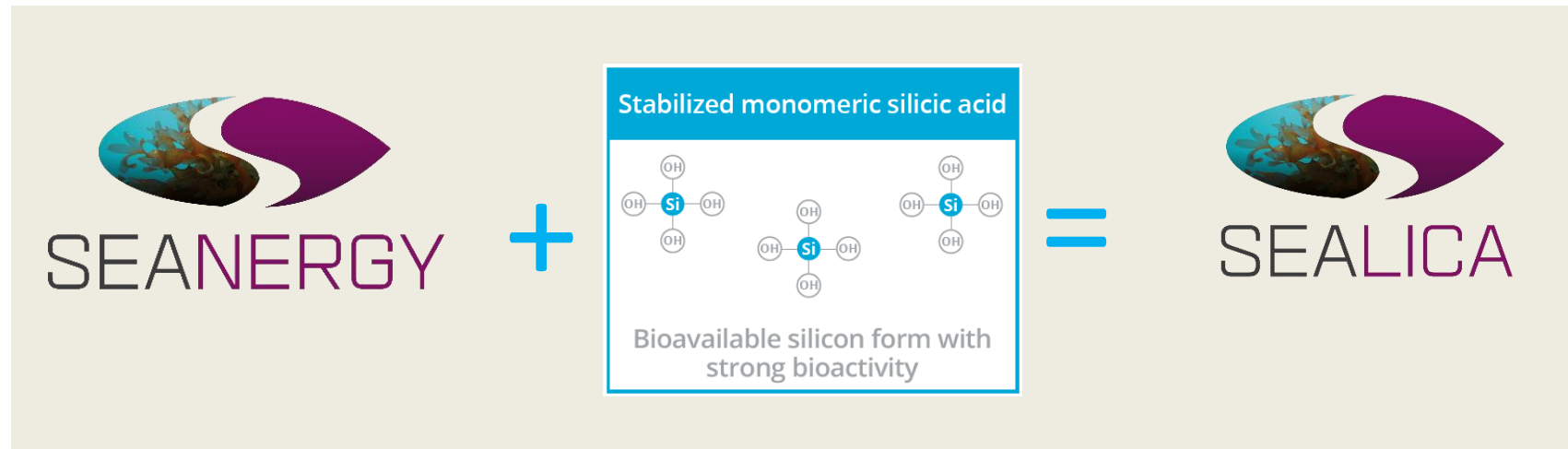
1-Better signalization of stress into the cell  
2-Strengthening of plant wall  
3-Stimulation of root development and exchange between plant and soil

- **Better resistance to the stress**
- **Hardenning of the turf**
- **Better nutrient uptake and transport**

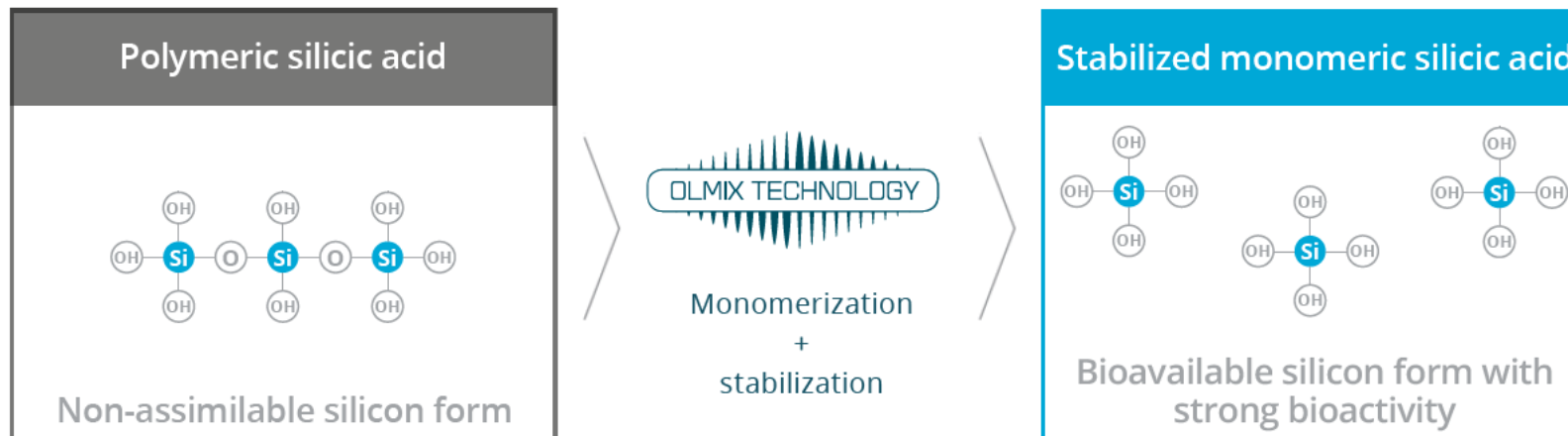


# Melgreen Si

## Association SEANERGY + monomeric silicic acid



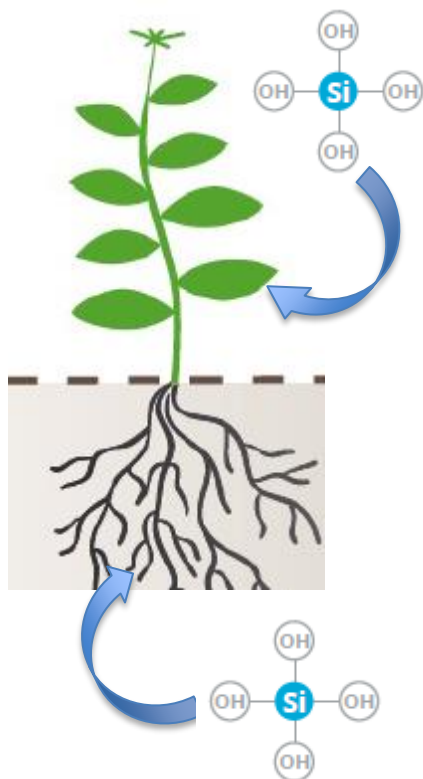
Plants assimilate silicon in the form of **monomeric orthosilicic acid** ( $\text{H}_4\text{SiO}_4$ ). This form is not readily found in nature due to its instability (rapid polymerization which makes silicon unavailable). Thanks to a unique proprietary process, Olmix succeeds in stabilizing silicon in this available form.



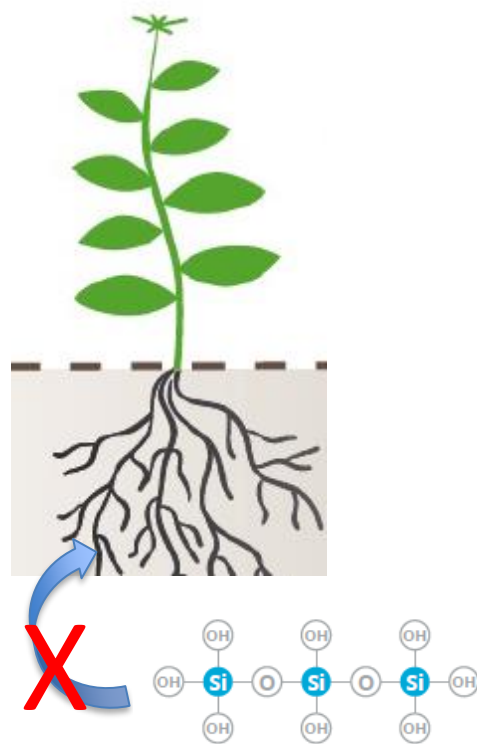
Studies have shown that 0.1 gal/ac of monomeric orthosilicic acid give the same quantity of silicon in plant tissue as 3.5 t/ac of calcium silicate and 5.8 t/ac of potassium silicate.



# Melgreen Si



The only form of available silicon for the plant is monomeric orthosilicic acid ( $\text{SiOH}_4$ )



Forme non assimilable

However, when a  $\text{SiOH}_4$  is close to another  $\text{SiOH}_4$ , there is polymerization between and the silicon become unavailable to the plant. In the soil, silicon is mainly under polymerized form



Thanks to SEALICA ingredient, Olmix concentrates in its products silicon monomeric highly available for the plant

Other forms of silicon (potassium silicate, calcium silicate, sand...) are not directly available for the plant. Scientific works shows that **1 liter/ha of orthosilicic acid** ( $\text{SiOH}_4$ ) leads to the same content of silicon in plant tissues than **8 tons/ha of calcium silicate** and **13 tons/ha of potassium silicate**

Monomeric silicon = orthosilicic acid =  $\text{SiOH}_4$  = 1 molecule of silicon alone



# Melgreen Cu



<b>Targeted crop</b>	Turf
<b>Dosage</b>	0,5-1l/ha
<b>Timing</b>	Every 3 to 4 weeks from April to October
<b>Usable in organic farming</b>	YES
<b>Packaging</b>	5 L
<b>Regulation</b>	EC Fertilizer

- 1-Stimulation of cell lignification
- 2-Production of antioxidant molecules

- **Strengthening of cell wall**
- **Hardening of the turf**
- **Better resistance to stress**

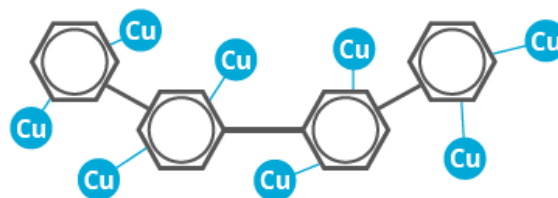


# Melgreen Cu

Association SEANERGY + Stabilized and micronized copper oxychloride



Stabilized micronized copper oxychloride



3  $\mu\text{m}$  size particle combined with biopolymer

Copper oxychloride is a specific form of copper with a high content of copper metal (50% of Cu).

To reinforce its bioactivity, Olmix processes a micronization and a combination with an organic biopolymer.



The Olmix technology increases the surface and the time of contact of copper on the leaf. Result is a high rapidity of action of Melgreen Cu and a better penetration of its ingredients into the plant, at an extremely reduced quantity of copper per acre.



# Oceamax



<b>Targeted crop</b>	Turf
<b>Dosage</b>	6 l/ha
<b>Timing</b>	All the year
<b>Usable in organic farming</b>	NO
<b>Packaging</b>	20 L
<b>Regulation</b>	Local norm

- 1-NK nutrition
- 2-Antistress molecules

- Improve growth
- Better resistance to stress



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## 3-Trial Results

- Purdue University – West Lafayette – Indiana – USA
- Penn State University – Berks Campus, Reading, Pennsylvania USA
- Penn State University – Berks Campus, Reading, Pennsylvania USA
- STRI experimental ground-UK

# TRIAL 1 **Creeping Bentgrass (3mm), putting green**

*Research trial – Purdue University – West Lafayette – Indiana – USA – 2018*

*Department of Horticulture and Landscape Architecture*

*Cale A. Bigelow Research Group-Purdue Turf Science Program*

\*Melgreen ELITE : Melgreen Si

# Melgreen



## Performance of Melgreen Red seaweed based liquid foliar nutritional products for Creeping Bentgrass on putting green

Research trial – Purdue University – West Lafayette – Indiana – USA – 2018

Department of Horticulture and Landscape Architecture

Cale A. Bigelow Research Group-Purdue Turf Science Program

### Objectives

To evaluate the effects of the Olmix red seaweed based liquid foliar nutritional program to maintain creeping bentgrass health on a sand-based research putting green rootzone during a full growing season in the Midwest, USA.

### Experimental Methods

- Grass variety: mature stand of creeping bentgrass (*Agrostis stolonifera* 'Declaration')
  - Zone of the study: calcareous sand-based putting green rootzone
  - Turf maintenance:
    - 0.135" (3mm) mowing height and mown six times per week with clippings removed
    - Disease (e.g. dollar spot) and insects were treated preventively
    - Irrigation was routinely applied in the absence of significant rainfall via overhead irrigation
  - Experimental design: 4 replicates-randomized complete block- 3 x 6 ft plots (18ft<sup>2</sup>)
  - Start of the trial: May 18<sup>th</sup> 2018
  - Data analysis: analysis of variance with p<0.05
  - Measurements and Analysis:
    - Turf quality was visually assessed on a weekly basis on a scale of 0-10, with 10 being optimal color, density, and uniformity, and 7 being minimally acceptable quality
    - Soil cores were harvested from each plot with a soil-profiler and analyzed using WinRhizo. Sampling the 23<sup>th</sup> October
- 
- Melgreen program:
    - **Melgreen Mn** is a highly soluble and concentrated red seaweed formulation, enriched with manganese to improve root development and turf nutrition.
      - 1 US fl oz/1000 ft<sup>2</sup> (3 L/ha) per application
    - **Melgreen ELITE** is a dedicated formula to enhance stress resistance of turf and nutrient uptake.
      - 1.6 US fl oz/1000 ft<sup>2</sup> (5 L/ha) per application
    - **Melgreen Cu** combines red seaweed extract and micronized copper oxychloride for a dedicated formula to improving vitality and resistance of the turf.
      - 0.15 fl oz/1000 ft<sup>2</sup> (500 ml/ha) per application



- 3 treatments were compared:

Week of:	Minimal fertilisation	Standard fertilisation	Melgreen MidAtlantic Program
20 May	0.1 N 46-0-0	0.125 N 46-0-0	Elite + Mn Tank Mix
27 May			
03 Jun		0.125 N 46-0-0	Cu
10 Jun			
17 Jun	0.1 N 46-0-0	0.125 N 46-0-0	Elite + Mn Tank Mix
24 Jun			
01 Jul		0.125 N 46-0-0	Cu
08 Jul			
15 Jul	0.1 N 46-0-0	0.125 N 46-0-0	Elite + Mn Tank Mix
22 Jul			
29 Jul			
05 Aug		0.125 N 46-0-0	Cu
12 Aug			
19 Aug	0.1 N 46-0-0	0.125 N 46-0-0	Elite + Mn Tank Mix
26 Aug			
02 Sep	0.1 N 46-0-0	0.125 N 46-0-0	Elite + Mn Tank Mix
09 Sep			
16 Sep			
23 Sep	0.1 N 46-0-0	0.125 N 46-0-0	Elite + Mn Tank Mix

\* Standard fertility 0.125# N from urea 46-0-0 was included with each Melgreen application. Foliar application were made with a spray volume equivalent 2 gallon per 1000ft.

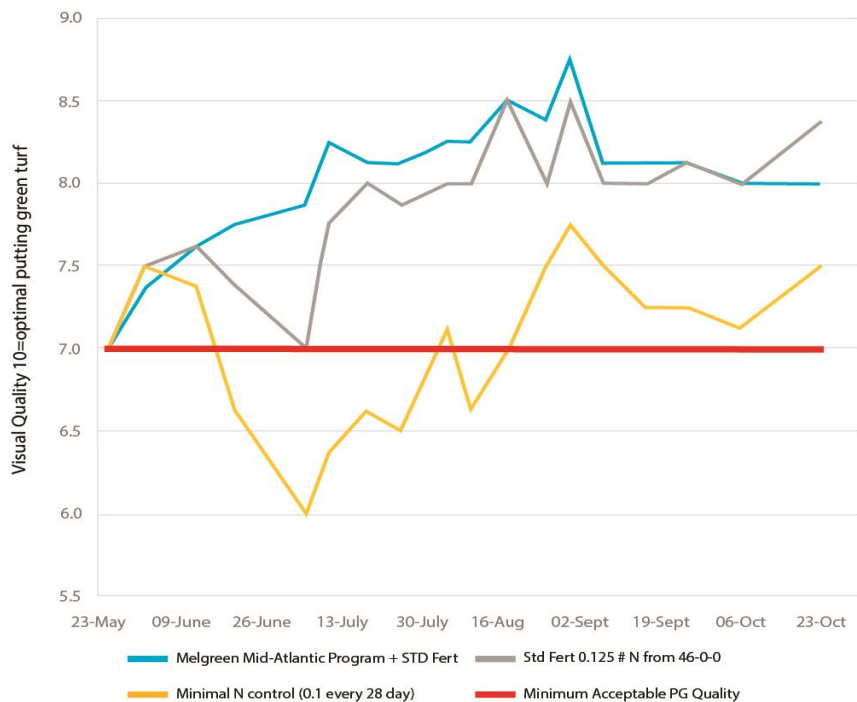


# Melgreen



## Results

Figure 1. Visual Quality of Creeping Bentgrass Putting Green Turf Treated with Various Fertilizer and Biostimulant Products-Purdue Univ. 2018



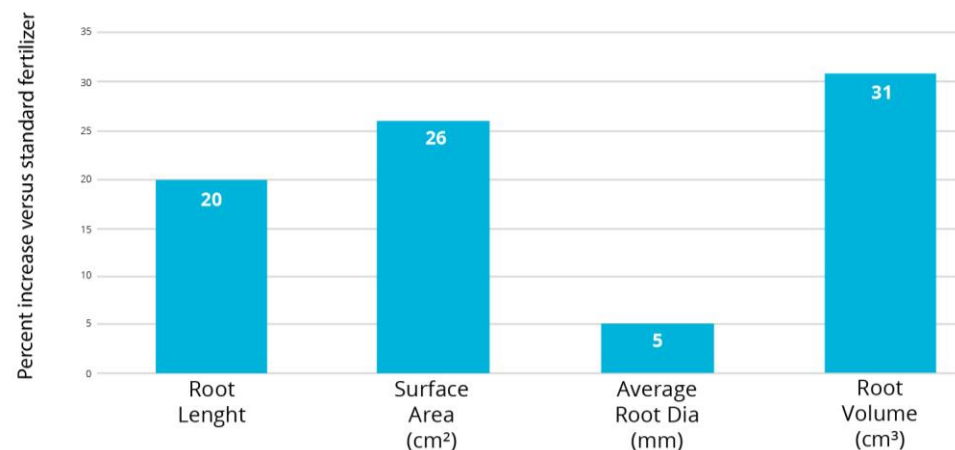
- Some program differences were observed across the 18 rating dates with the Melgreen program in the top statistical grouping 94% of the time versus the 83% for the standard fertilizer alone.
- Numerical turf quality ratings for the Melgreen program were higher than the standard fertility program on 11 of 18 measurement dates.

## Conclusion

The application of Melgreen products in comparison with a standard fertility program led to :

- Higher visual turf quality during summer
- Better root development with an **increase in root volume (+31%), root length (+20%)** and **root surface area (+31%)**. This may have led to improved nutrient uptake and a better stress resistance.

Figure 2. Comparison of Rooting Responses Melgreen Program + Standards Fertilizer Versus Standard Fertilizer Alone On Putting Green Turf 23th October 2018



- The Melgreen program resulted in an increase in a range of key root parameters as compared to the standard fertilizer program. Fall measurements showed a 20% increase in root length and 5% increase in root diameter resulting in greater surface area (26% increase) and greater total root volume (31% increase).
- The Melgreen program followed in this 2018 study improved turf quality, positively influenced turf canopy color and resulted in increased rooting under summer stress conditions that are commonly found in the midwest US.



Standard Fertilizer – 0.125# N from 46-0-0

Turf Quality Rating – 6.5

**DUE**  
SITY

Melgreen Program 2 + Standard Fertilizer

Turf Quality Rating – 8.5

**DUE**  
UNIVERSITY

Standard Fertilizer – 0.125# N from 46-0-0

Turf Quality Rating – 6.5

**DUE**  
SITY

Melgreen Program 2 + Standard Fertilizer

Turf Quality Rating – 8.5

**DUE**  
SITY

## TRIAL2 **Creeping Bentgrass (13mm), fairway**

*Research trial – Penn State University – Berks Campus, Reading, Pennsylvania USA – 2018*  
*Michael A. Fidanza – Department of Plant Science*

\*Melgreen ELITE : Melgreen Si

# Melgreen



## Performance of Melgreen red seaweed based liquid foliar nutritional products for Creeping Bentgrass on a sand-capped rootzone fairway

Research trial – Penn State University – Berks Campus, Reading, Pennsylvania USA – 2018  
 Michael A. Fidanza – Department of Plant Science

### Objectives

To evaluate the effects of an Olmix foliar nutrition program to maintain creeping Bentgrass health on a sand-capped research fairway rootzone during a full growing season in the humid northeast USA.

### Experimental Methods

- Grass variety: mature stand of creeping Bentgrass (*Agrostis stolonifera* 'Penn Trio')
  - Rootzone: sand capped site with approximately 4 inches (10 cm) coarse sand over a silt loam soil
  - Turf maintenance:
    - 0.5" (13mm) mowing height and mown six times per week with clippings removed
    - Disease (e.g. dollar spot) and insects were treated preventively
    - Irrigation was routinely applied in the absence of significant rainfall via overhead irrigation
  - Experimental design: 4 replicates-randomized complete block-3x6ft plots (18ft<sup>2</sup> = 1,6m<sup>2</sup>)
  - Start of the trial: May 13<sup>th</sup> 2018
  - Data analysis: analysis of variance with p<0.05
  - Measurements and analysis:
    - Turf quality was visually assessed on a scale of 1-9, with 9 being optimal and 6 being minimally acceptable quality.
    - Turf root system effects were measured twice (Spring-Fall). Soil cores were harvested from each plot with a soil-profiler on September 19<sup>th</sup>, and the rootzone analyzed using WinRHIZO.
- 
- Melgreen program:
    - Melgreen Mn** is a highly soluble and concentrated red seaweed formulation, enriched with manganese to improve root development and turf nutrition.
      - 1 US fl oz/1000 ft<sup>2</sup> (3 L/ha) per application
    - Melgreen ELITE** is a dedicated formula to enhance stress resistance of turf and nutrient uptake.
      - 1.6 US fl oz/1000 ft<sup>2</sup> (5 L/ha) per application
    - Melgreen Cu** combines red seaweed extract and micronized copper oxychloride for a dedicated formula to improving vitality and resistance of the turf.
      - 0.15 fl oz/1000 ft<sup>2</sup> (500 ml/ha) per application



- 3 treatments were compared:

Week of:	Untreated	Standard fertilisation	Melgreen Program*
13 May		0.5 N 46-0-0	Elite, 0.5 N 46-0-0
03 Jun			Elite + Mn Tank Mix
10 Jun		0.5 N 46-0-0	0.5 N 46-0-0
17 Jun			Cu
01 Jul			Elite + Mn Tank Mix
15 Jul		0.5 N 46-0-0	Cu, Elite + Mn Tank Mix
29 Jul			Elite + Mn Tank Mix
12 Aug		0.5 N 46-0-0	0.5 N 46-0-0
19 Aug			Cu
02 Sept			Elite + Mn Tank Mix
09 Sept		0.5 N 46-0-0	0.5 N 46-0-0
23 Sept			Cu
14 Oct		0.5 N 46-0-0	0.5 N 46-0-0
28 Oct			Cu
11 Nov		0.5 N 46-0-0	0.5 N 46-0-0
02 Dec			Cu

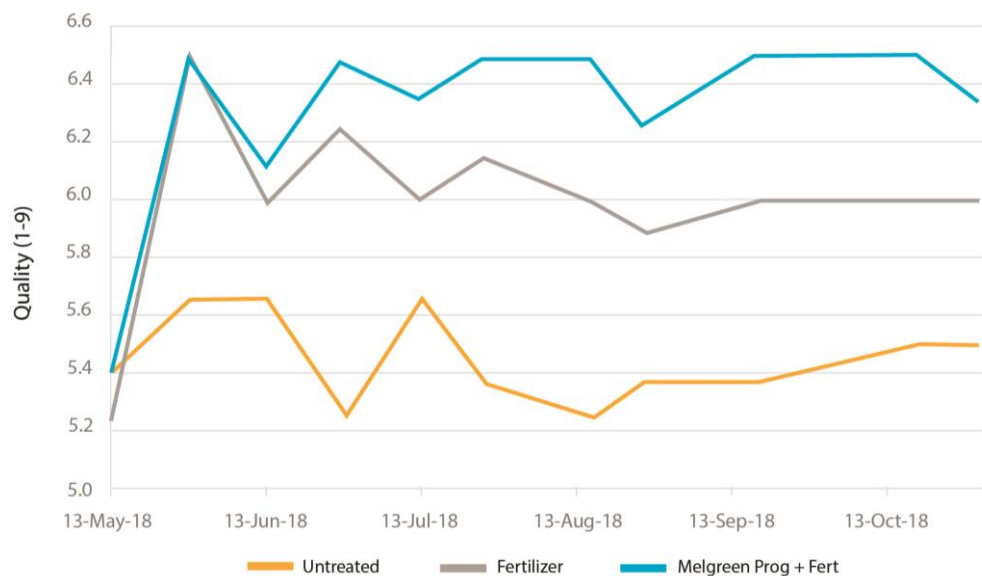
\* Melgreen product treatments and fertilizer applications were made independently Foliar application were made with a spray volume equivalent to 1 gallon per 1000ft (410l/ha).

# Melgreen



## Results

Figure 1. Effect of Melgreen Program on Fairway Height Bentgrass  
Penn State University – Berks (2018)



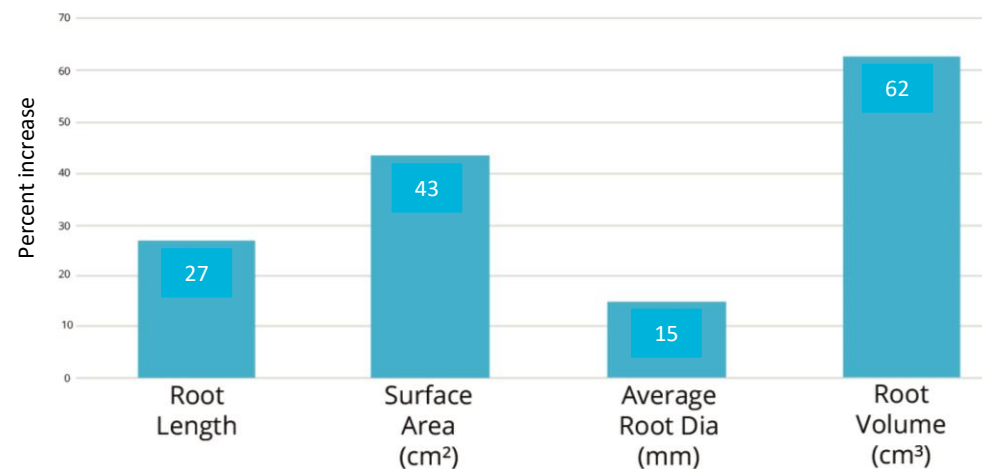
- Treatment differences were observed across the 13 rating dates with the Melgreen program in the top statistical grouping 92% of the time versus 38% for the standard fertilizer alone.
- Numerical turf quality ratings for the Melgreen program were higher than the standard fertility program on 11 of 13 measurement dates.

## Conclusion

The application of Melgreen products in comparison to a standard fertility program led to:

- Higher turf visual quality throughout the growing season
- Improved root development – increasing root length (+27%) and wider roots (+15%) resulting in greater volume (+62%) with more surface area (+43%)

Figure 2. Percent increase in key rooting parameters  
Melgreen Program + Std Fert over Std Fert alone  
Fairway Ht Bentgrass – Penn State-Berks (19 Sep 2018)



The Melgreen program increased a range of key root parameters as compared to the standard fertilizer program. All measurements showed a 27% increase in root length and 15% increase in root diameter resulting in greater surface area (43% increase) and greater total root volume (62% increase).

## TRIAL 3 **Kentucky Bluegrass (38mm), grass**

*Research trial – Penn State University – Berks Campus, Reading, Pennsylvania USA – 2018*  
*Michael A. Fidanza – Department of Plant Science*

\*Melgreen ELITE : Melgreen Si

# Melgreen



## Melgreen red seaweed based liquid foliar nutritional products for Kentucky Bluegrass summer performance on a Silt-Loam Rootzone

Research trial – Penn State University – Berks Campus, Reading, Pennsylvania USA – 2018  
 Michael A. Fidanza – Department of Plant Science

### Objectives

To evaluate the effects of an Olmix foliar nutrition program to maintain Kentucky bluegrass health on silt-loam rootzone during a full growing season in the humid northeast USA.

### Experimental Methods

- Grass variety: mature stand of Kentucky bluegrass
  - Zone of the study : silt loam soil
  - Turf maintenance:
    - 1.5" (38mm) mowing height
    - Disease (e.g. dollar spot) and insects were treated preventively.
  - Experimental design: 4 replicates-randomized complete block- 3 x 5 ft plots (15ft<sup>2</sup>= 1,4m<sup>2</sup>)
  - Start of the trial: May 13<sup>th</sup> 2018
  - Data analysis: analysis of variance with p<0,05
  - Measurements and analysis:
    - Turf quality was visually assessed on a scale of 1-9, with 9 being optimal color, density, and uniformity, and 6 being minimally acceptable quality.
    - Turf root system effects were measured twice (Spring-Fall). Soil cores were harvested from each plot with a soil-profiler on September 19<sup>th</sup>, and the rootzone analyzed using WinRHIZO.
- 
- Melgreen program:
    - **Melgreen Mn** is a highly soluble and concentrated red seaweed formulation, enriched with manganese to improve root development and turf nutrition.
      - 1 US fl oz/1000 ft<sup>2</sup> (3 L/ha) per application
    - **Melgreen ELITE** is a dedicated formula to enhance stress resistance of turf and nutrient uptake.
      - 1.6 US fl oz/1000 ft<sup>2</sup> (5 L/ha) per application
    - **Melgreen Cu** combines red seaweed extract and micronized copper oxychloride for a dedicated formula to improving vitality and resistance of the turf.
      - 0.15 fl oz/1000 ft<sup>2</sup> (500 ml/ha) per application



- 3 treatments were compared:

Week of:	Untreated	Standard fertilisation	Melgreen Program*
13 May		0.5 N 46-0-0	Elite, 0.5 N 46-0-0
03 Jun			Elite + Mn Tank Mix
10 Jun		0.5 N 46-0-0	0.5 N 46-0-0
17 Jun			Cu
01 Jul			Elite + Mn Tank Mix
15 Jul		0.5 N 46-0-0	Cu, Elite + Mn Tank Mix
29 Jul			Elite + Mn Tank Mix
12 Aug		0.5 N 46-0-0	0.5 N 46-0-0
19 Aug			Cu
02 Sept			Elite + Mn Tank Mix
09 Sept		0.5 N 46-0-0	0.5 N 46-0-0
23 Sept			Cu
14 Oct		0.5 N 46-0-0	0.5 N 46-0-0
28 Oct			Cu
11 Nov		0.5 N 46-0-0	0.5 N 46-0-0
02 Dec			Cu

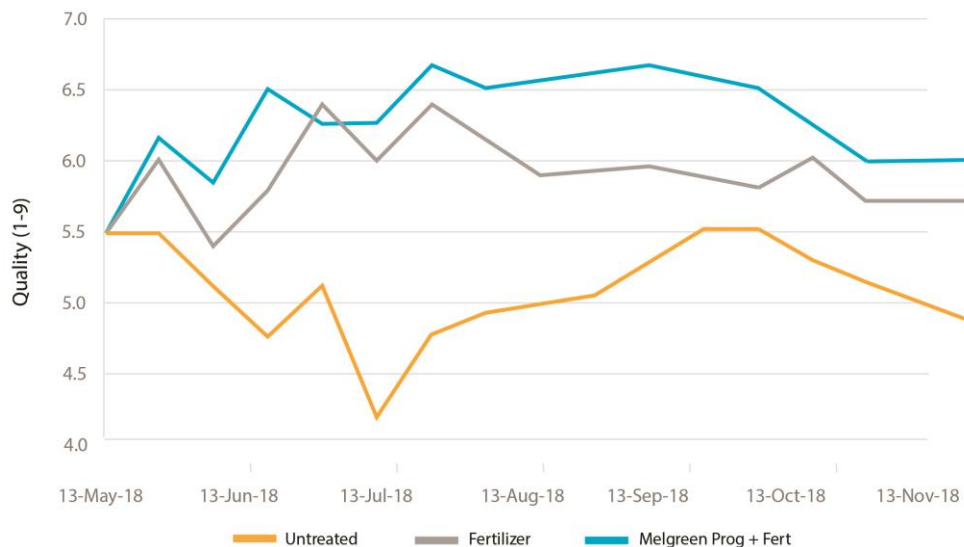
\* Melgreen product treatments and fertilizer applications were made independently. Foliar application were made with a spray volume equivalent to 1 gallon per 1000ft (410l/ha).

# Melgreen



## Results

Figure 1. Effect of Melgreen Program on Sports Turf Quality Kentucky Bluegrass – Penn State University - Berks (2018)



Visual quality (figure 1):

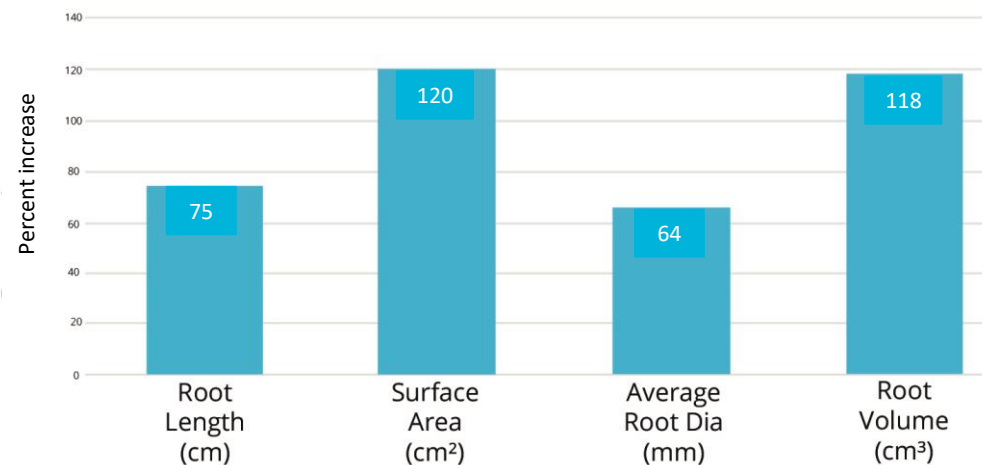
- Treatment differences were observed across the 12 post-treatment rating dates. The Melgreen program was in the top statistical grouping on each rating date, while the standard fertilizer alone was only in that category on four dates.
- Numerical turf quality ratings for the Melgreen program were higher than the standard fertility program on 11 of 12 measurement dates and significantly higher on 6 of 12 dates (p=0.05).

## Conclusion

The application of Melgreen products in comparison to a standard fertility program led to:

- Higher turf visual quality throughout the growing season
- Improved root development – increased root length (+75%) and roots width (+64%) resulting in greater root volume (+118%) and surface area (+120%)

Figure 2. Effect of Melgreen Prog + Standard Fert versus Standard Fertilizer Alone on Key Rooting Parameters - Kentucky Bluegrass - Penn State University - Berks (2018)



Rooting Analysis (figure 2):

The Melgreen program resulted in an increase in a range of key root parameters as compared to the standard fertilizer program. Fall (September) measurements showed a 75% increase in root length and 64% increase in root diameter resulting in greater surface area (120% increase) and greater total root volume (118% increase).

# Melgreen



## Performance of Melgreen red seaweed based liquid foliar nutritional products for golf green turf

Research trial – STRI experimental ground-UK– 2013  
Christian Spring

### Objectives

The objective of the trial was to determine the effect of various fertiliser and foliar treatments on turf health and disease incidence in golf green turf. Treatments started in June 2013 and continued through until early November 2013. High disease pressure was observed from September to November 2013, with microdochium patch the main disease affecting the turf.

### Experimental Methods

- Rootzone: The rootzone was a sandy loam soil with a substantial thatch layer to ensure turf stress and disease incidence.
- Experimental design: 3 replicates-split plot design-2x1,5 (3m<sup>2</sup>)
- Start of the trial: June 25<sup>th</sup> 201
- Assessments : Assessments were made at regular intervals for a period of approximately 10 months.
- Measurements and analysis:
  - Disease When present, the severity of disease on each plot was recorded as a percentage plot area affected. Assessments were made before the initial treatment application and where appropriate, disease development was assessed approximately fortnightly.
  - Turf quality Turf was assessed visually for quality. Assessments were carried out before treatment application and approximately fortnightly.

### Tested Programs

#### 6 programs are compared:

Tested programs	Fertilizer	Foliar tank mix
Untreated	/	/
HF	Headland	/
HF + OGT/F	Headland	OGT/Floratine tank mix
HF + M	Headland	Melgreen
HF + H	Headland	Headland
EF + OGT/F	Everris	OGT/Floratine tank mix
M + M	Marathon	Melgreen

Fertilizer are applied monthly (25.06/24.07/21.08/13.09/15.10)

Foliar product treatments application were made with a spray volume equivalent to 400l/ha



#### Foliar programs:

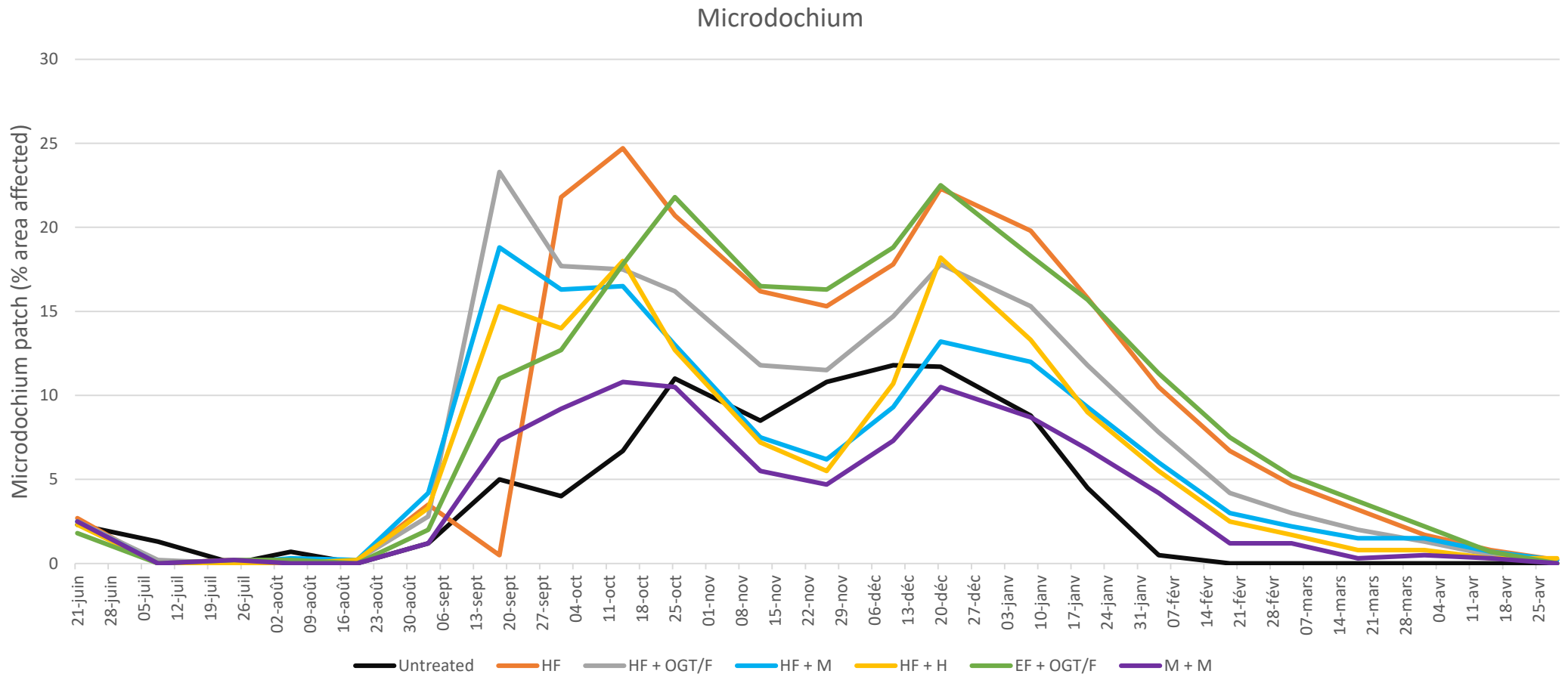
Foliar programm	Dosage (l/ha)	Application
<b>OGT/Floratine tank mix</b> Alga green Turgor PK Fight	10 5 5	1 and 3 weeks after fertiliser application
<b>Melgreen</b> Melgreen Mn Melgreen Si Melgreen Cu Melstar	4 5 0,5 0,15 g/m <sup>2</sup>	1 week after fertiliser application : Melgreen Mn + Melgreen Si  3 weeks after fertiliser application : Melgreen Cu + Melstar S
<b>Headland</b> Seamac Proturf Liquid Turf Hardener Turfite	20 20 20	1 and 3 weeks after fertiliser application



# Melgreen

## ▶ Microdochium patch

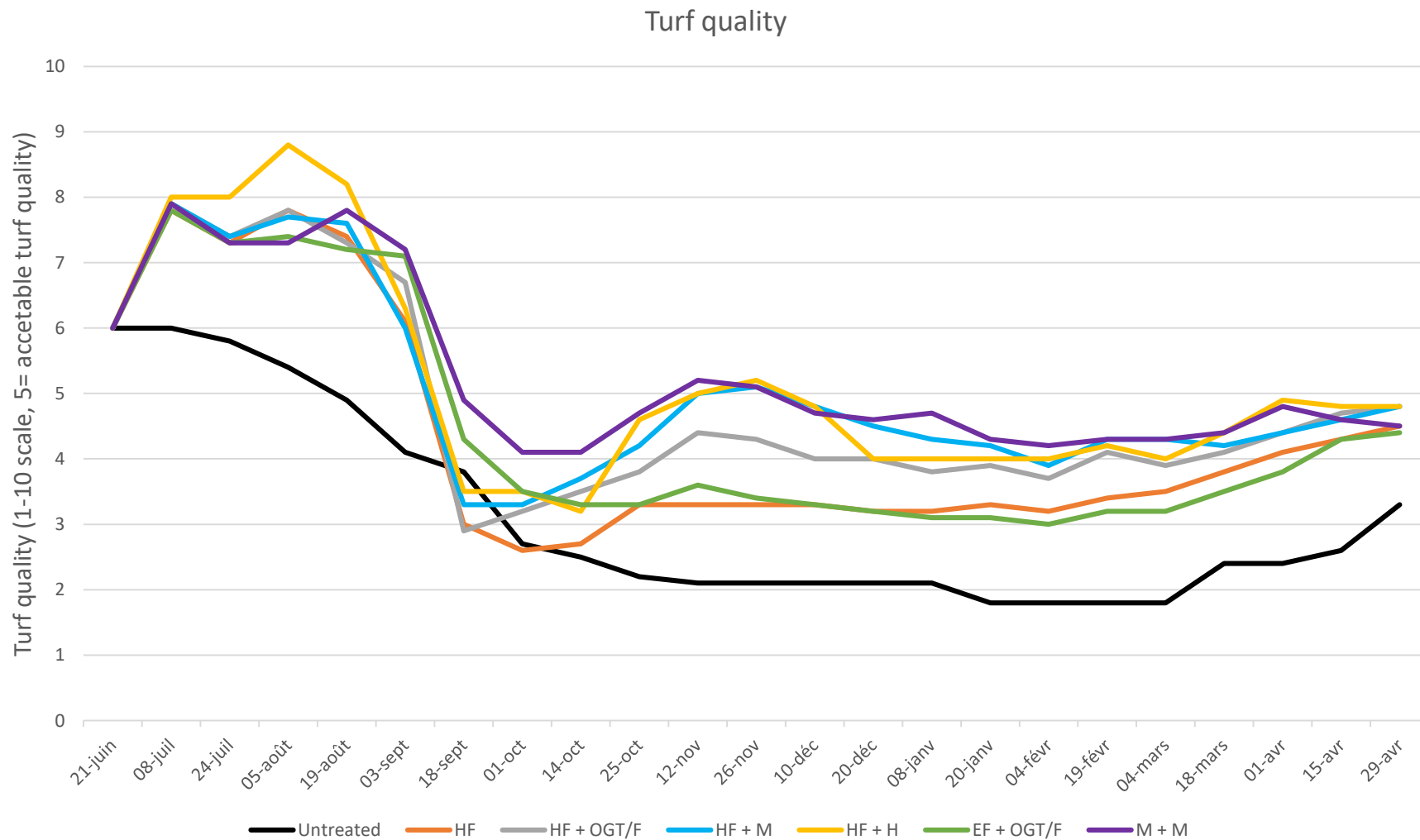
Disease When present, the severity of disease on each plot was recorded as a percentage plot area affected. Assessments were made before the initial treatment application and where appropriate, disease development was assessed approximately fortnightly.



# Melgreen

## ► Turf quality

Turf quality was assessed visually for quality. Assessments were carried out before treatment application and approximately fortnightly.



# Melgreen

## ▶ Turf quality

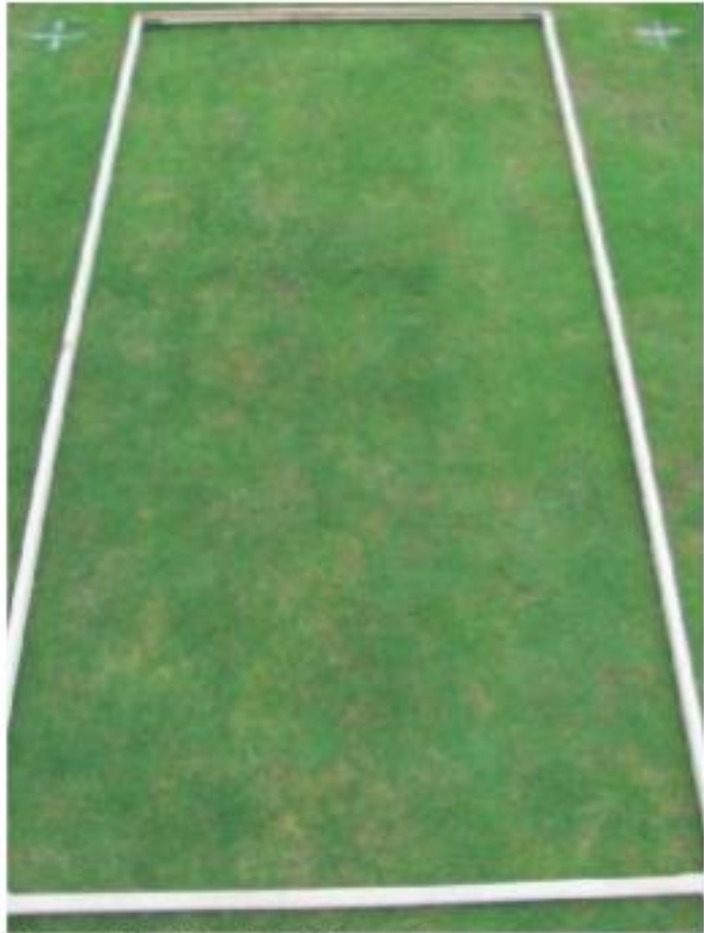


Plate 2: Headland fertiliser only

Headland F only



Plate 4: Headland fertiliser + Melspring tank mix

Headland F + Melgreen



Plate 3: Headland fertiliser + OGT/Floratine tank mix

Headland F + OGT/Floratine

# Melgreen

## ► Turf quality



Plate 5: Headland fertiliser + Headland tank mix

Headland F + Headland Fertilizer



Plate 6: Everris fertiliser + OGT/Floratine tank mix

Everris F + OGT/Floratine



Plate 7: Melspring fertiliser + Melspring tank mix

Marathon F + Melgreen

## ► STRI Conclusion



Of the three foliar tank mixes applied during the trial, when applied with the same fertiliser, the Olmix and Headland programmes tended to perform similarly, especially with regard to levels of disease on treated turf.

With regard to microdochium patch, the Olmix tank mix seemed to consistently have less disease than the OGT/Floratine programme, which also had silicon as part of the mix.

The Headland tank mix tended to produce slightly greener turf than the other foliar programmes, with both the Headland and Melspring tank mixes having greener turf than when the fertiliser was applied on its own.

Of the fertiliser + microfolar treatments, the Olmix complete programme seemed to offer the optimum package. The Olmix programme had less microdochium patch than many of the other treatments, especially when the disease started become visible in September/October 2013. There looked to be a synergistic effect of using the combination of Marathon fertiliser with the Melgreen tank mix, over the effect of just the tank mix with another fertiliser programme. The complete Olmix programme also resulted in good turf colour and optimal turf quality throughout trial. The Headland complete programme was comparable to the Olmix programme, except that at certain points in the trial, turf treated with this programme tended to have more disease than turf under the Olmix programme.





*Thank you for your attention*