

# NVTL Studiedag: Water and Air treatment with Ozone





# AGROZONE



Water treatment



Air treatment

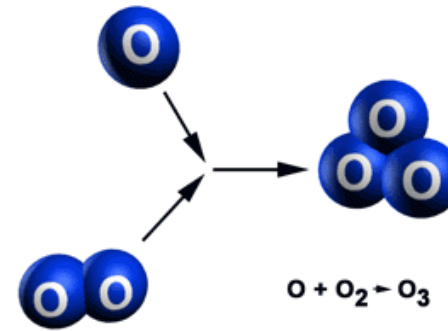


Odor control

**‘Increasing crops with technical innovations’**



# OZONE



## What is Ozone (O<sub>3</sub>)

- A natural gas
- Produced out of oxygen
- Ozone is made with UV light or static electricity
- 300 times stronger chlorine
- Unstable and falls back to oxygen





# Goal of AGROZONE

**100% closed loop for water in Greenhouses**

1. No water loss
2. No nutrients loss
3. Safety of crop by disinfection
4. No chemicals into the environment
5. Maximum yield by adding oxygen





# How do we achieve this goal

1. START with good and clean water, treat your incoming water with ozone (for instance rainwater)
2. Ozone system does not rinse
3. Amount of ozone does not affect nutrients
4. Ozone oxidizes virusses, bacteria and fungi
5. Ozone oxidizes active substances of pesticides
6. Ozone sets back into oxygen, removes root residues and biofilm





# Desinfection requirements

Desinfection requires:

- concentration of ozone (C in mg/L)
- contact time (t in min.)
- resulting in a Ct value (mg.min/L)

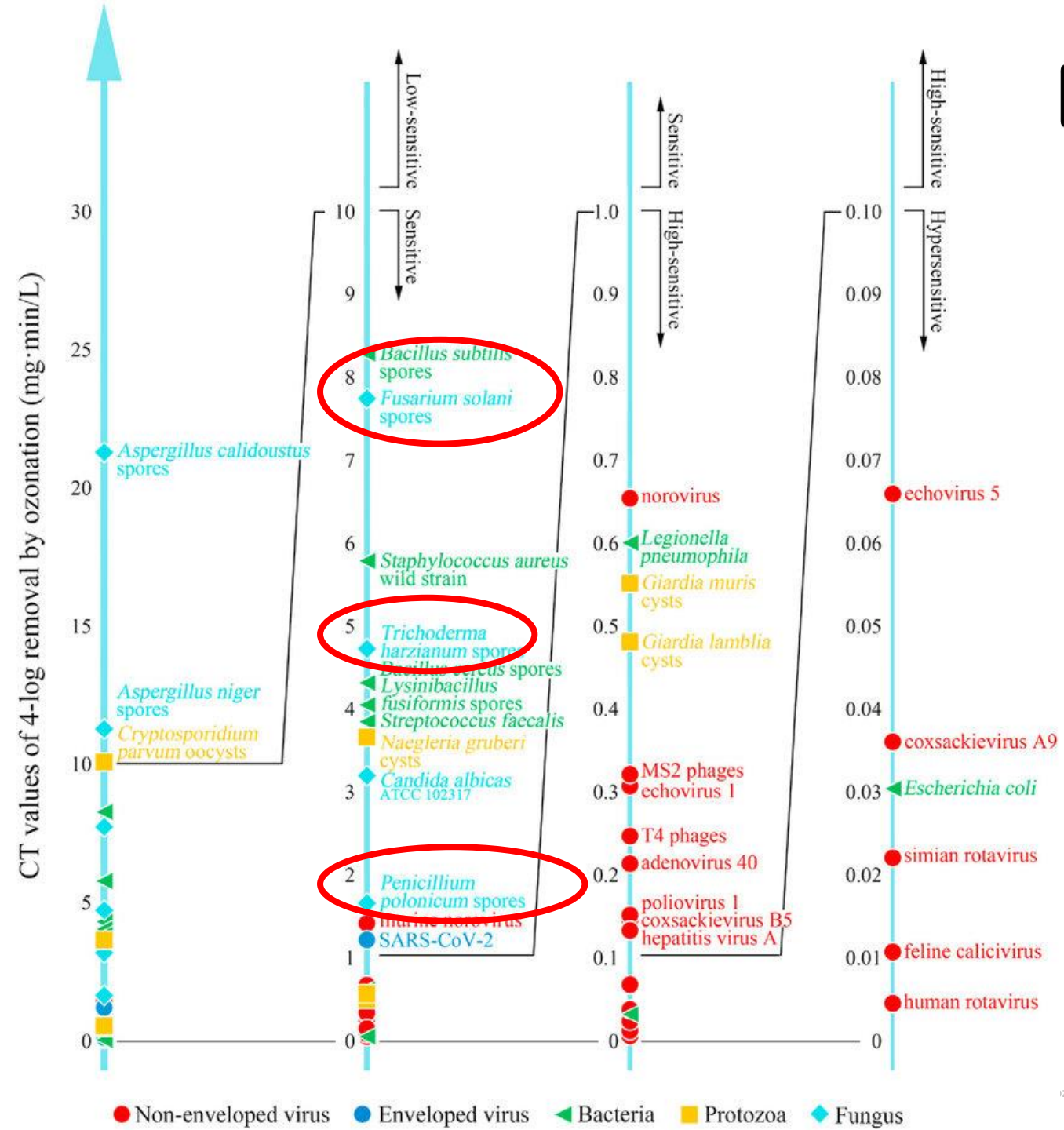
Ct data micro organisms known from literature

Agrozone uses ORP (redox potential) as an online process indicator for ozone concentration/desinfection

Combination Pump rate and reaction vessel volume defines contact time



# Ct data (mg.min/L)



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# Results



		Silo 12, 59,7 m3/uur, 724 mV		Richtwaarden na ontsmetter
		Voor Aqualine	Na Aqualine	
		VD-O (SP01)	VD-B (SP02)	
pH	-	6,93	6,74	
EC	µS/cm	3343	3165	
Opgelost zuurstof	mg/l	11,05	26,93	
IJzer	mg/l	4,1	4,2	
Kiemgetal bacteriën 30° C	kve/ml	170.000	< 400	< 500
Kiemgetal schimmels	kve/ml	50	< 10	< 25
Kiemgetal gisten	kve/ml	50	< 10	< 25
Fusarium spp	kve/50 ml	3	0	
Pytium spp.	kve/100 ml	+	-	
Phytophthora	kve/100 ml	-	-	
Opmerkingen		helder	helder	

Oxygen increases

## Desinfection

- Bacteria
- Fungi
- Yeast
- Viruses

kve = kolonie vormende eenheden  
- = niet aangetoond  
+ = aangetoond





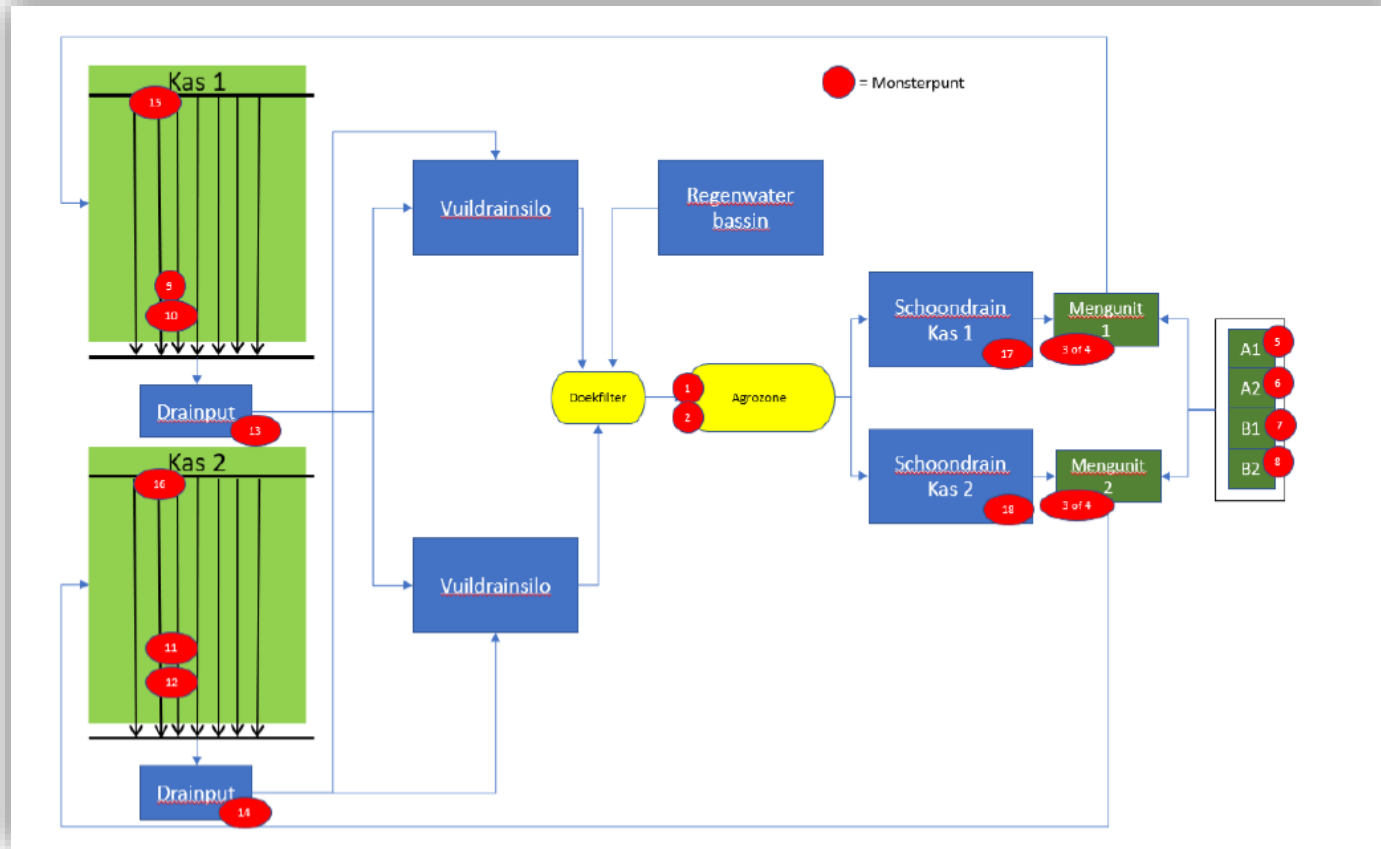
# What is also essential: Filtering



Before treating the water with ozone all particles, which float in the water, have to be removed. This can also be achieved without water loss



# Find the problem: Waterscan



Agrozone (Aurora Group) can perform a  
Waterscan to pinpoint the problem



# Find the problem: Waterscan

1. (Update) Flow chart water system including nutrient addition and disinfection
2. Determine crucial points (intake water bassins, nutrient vessels, greenhouse lines, drain water, disinfected water)
3. Sample and analyse crucial points
4. Interpretation en conclusion
5. Advise for improvement



# AGROZE: OZONE in air

## Multisplit system for air treatment applicable to

- Storage of products (bulbs, tomatoes, ....)
- In greenhouse horticulture (use less chemicals)





# AGROZONE

## Ozone in Odor Control

Odor control by means of ozone is one of the most powerful techniques at the moment for reducing odor nuisance and preventing nuisance.







# Questions

**AGROZONE**  
AURORA GROUP





Dalenk 3H, NL-7371 DE  
Loenen

info@agrozone.nl  
agrozone.nl  
+31 (0)88 422 82 22  
+31 (0)88 422 82 20 (service)