

THE EFFECT OF MICROALGAE EXTRACTS ON BIOTIC AND ABIOTIC STRESS IN FRUIT CROPS

De Ruyter Y.¹, Vanwalleghem T.¹, Van Hemelrijck W.¹, Holtappels M.¹, Simons Q.², Bastiaens L.², Bylemans D.¹


1. Research Center for Fruit Growing npo, Department of Phytopathology, Fruittuinweg 1 Sint-Truiden Belgium, vana.deruyter@pcf fruit.be
2. VITO, Conversion and Separation Technologies department, Boeretang 200, 2400 Mol, Belgium

The intensive use of chemical management practices in agriculture, such as synthetic pesticides and fertilizers, is yielding detrimental impacts on both the environment and human health. Therefore, the search for alternative methods to mitigate these negative effects has become a topic of great interest. At the core of these new strategies are biopesticides, biofertilizers and biostimulants. In line with this, during this project the potential of microalgae extracts was investigated to determine their efficacy against biotic and abiotic stress factors affecting fruit crops.

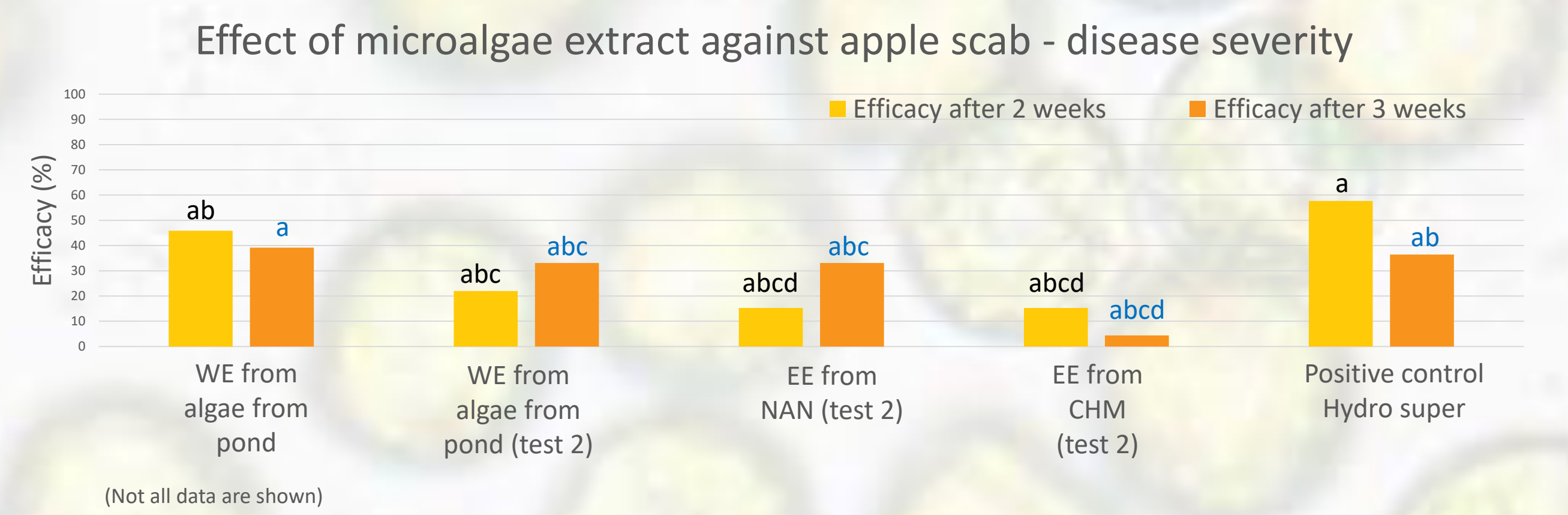
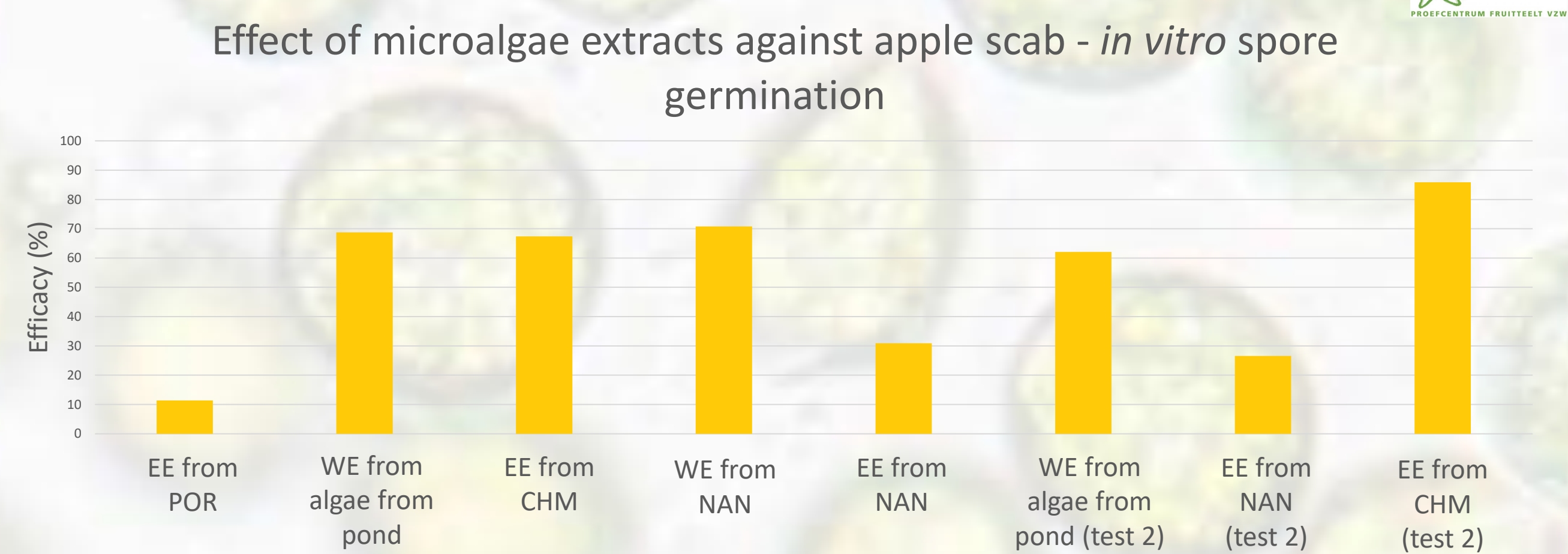
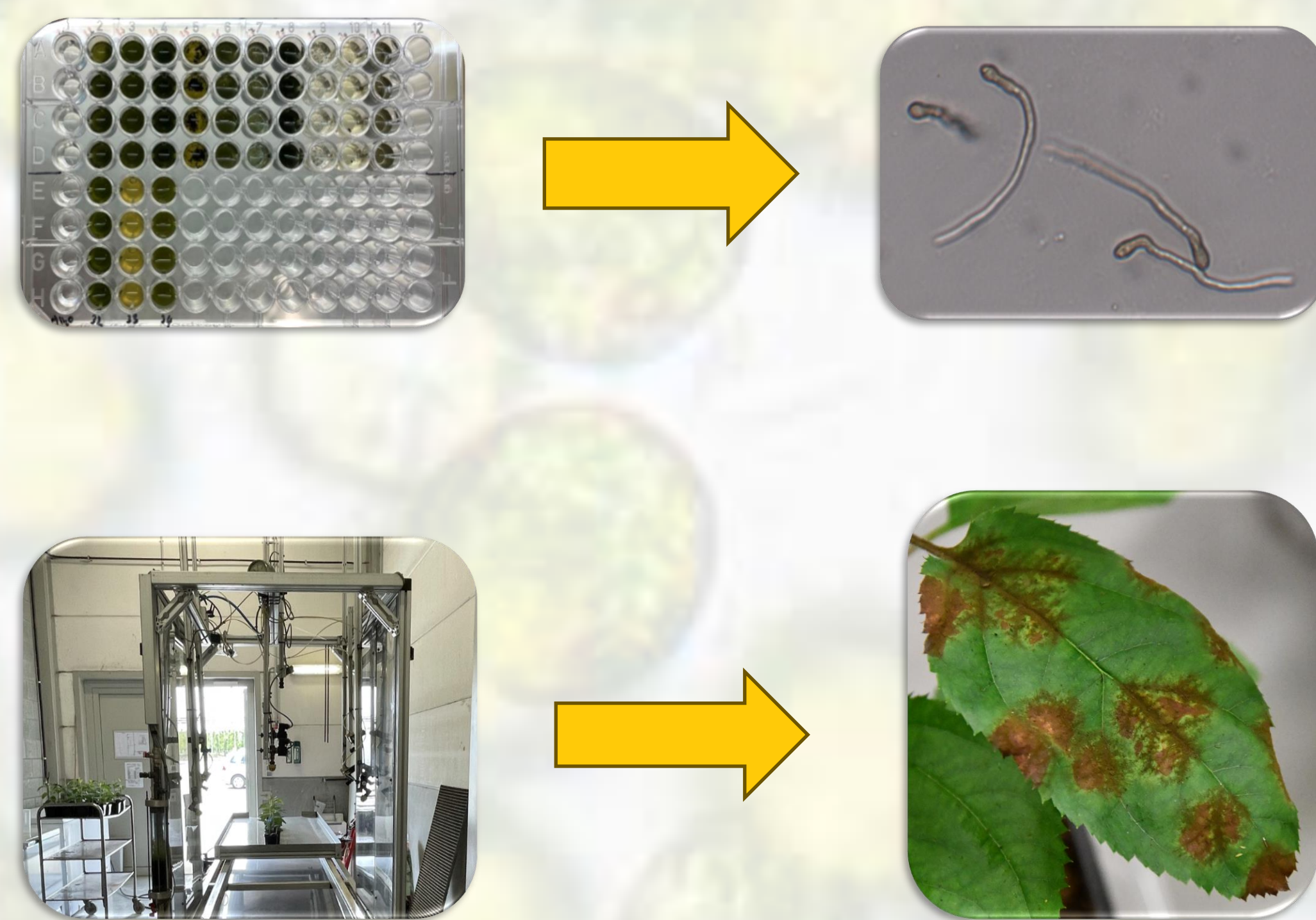
From different IDEA biomass types (see table), water (WE) and ethanol extracts (EE) and residues were prepared after a cell disruption step. To generate sprayable solutions, additional filtration steps were needed, which might have retained some compounds. In this respect, frozen extract were preferred above freeze-dried extracts.

Overview of algae biomass & fraction type that were evaluated

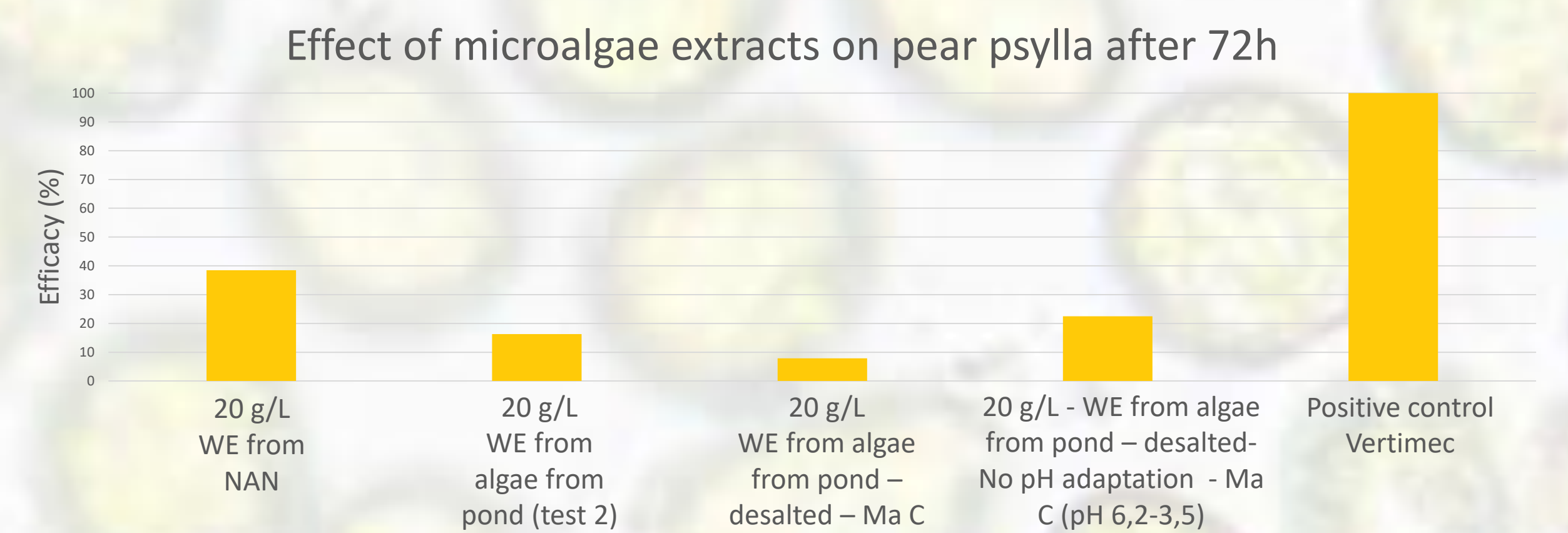
Algae species	Grown on	Fraction type
Mixed algae culture from open pond	Process water 1 from demineralization unit (PW1)	WE, WE desalted
<i>Nannochloropsis gaditana</i> (NAN)	MAF-permeate of Process water 1	WE, EE
<i>Chloromonas typhos</i> (CHM)	MAF-permeate of Process water 1	WE, EE
<i>Scenedesmus</i> sp. (SCE)	Digestate	Whole biomass
<i>Porphyridium purpureum</i> (POR)	Artificial medium	WE, EE



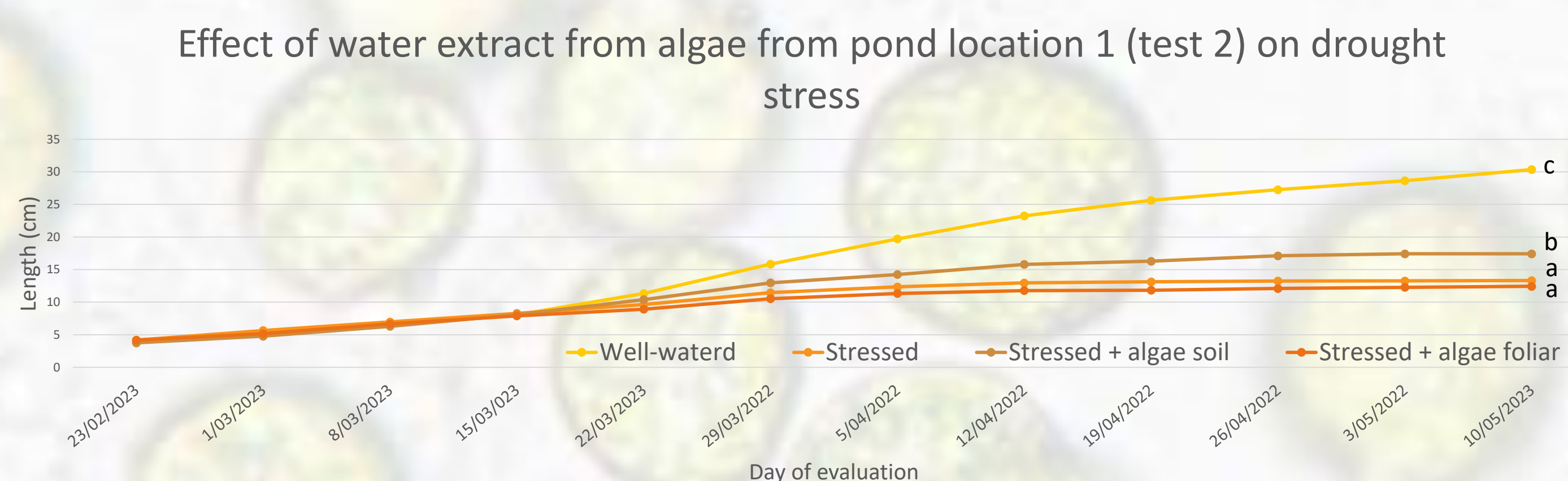
Venturia inaequalis = apple scab



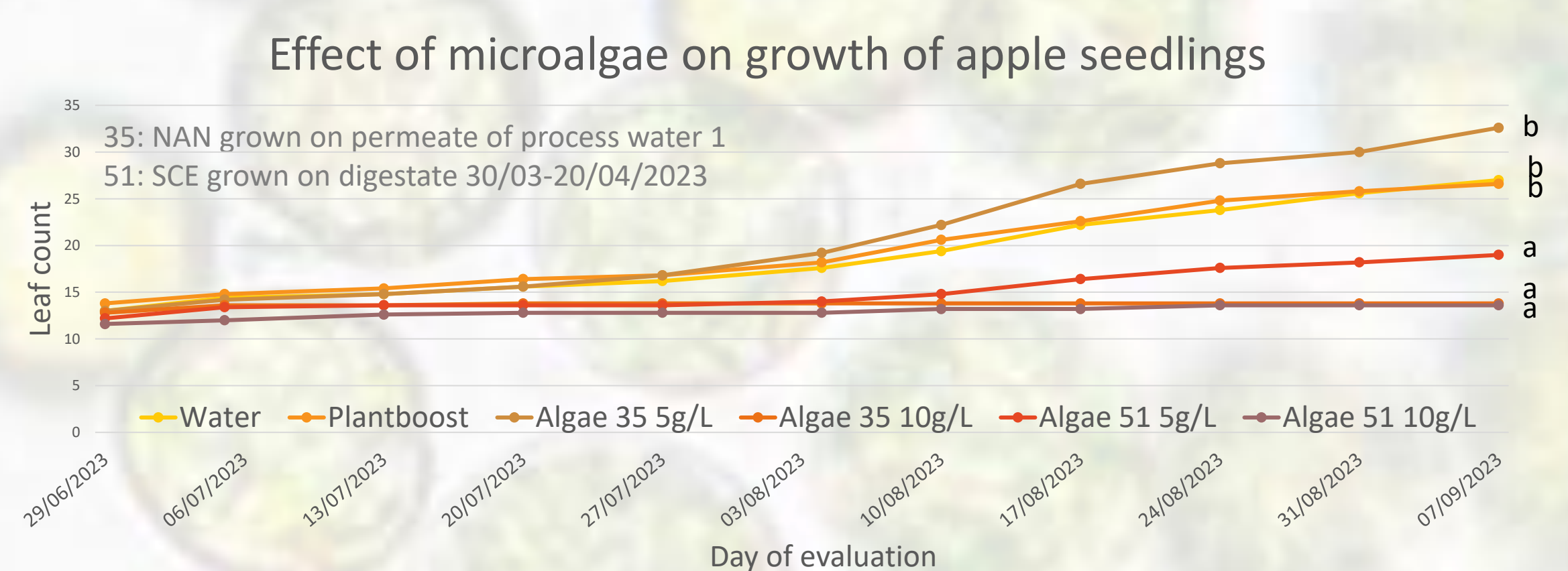
Cacopsylla pyri = pear psylla



Drought stress



Fertilization



Some extracts show promising results in *in vitro* and *in vivo* trials. However, results did differ greatly depending on stress factor or trial. Therefore, further research is required for full enclosure.

