Made in Danube

Transnational Cooperation to transform knowledge into marketable products and services for the Danubian sustainable society of tomorrow

Final Report

Title of service: Biological Activity Trials

Service provider: SGS Hungary Ltd.

Work package Number	WP5
Work package Title	Implementation of pilot projects
Activity Number	A 5.1
Activity Title	Common sustainable innovation partnership projects
Deliverable Number	D 5.1.1
Deliverable Title	Pilot implementation of the Local Action Plan for Smart and Innovative Precision Farming Final Report

Project co-funded by European Union funds (ERDF, IPA)
Project webpage: www.interreg-danube.eu/made-in-danube

GEP TRIAL REPORT

Report date:

10-Jun-2019

Trial set up for
Union of Slovak Clusters
Piaristicka 2, 949 01 Nitra, Slovakia

SGS **Protocol n°: Pewas 2019**

Crop : **Corn and Winter Barley**

Study Director: István János Juhász

Study Objective:

Germination test and Initial growth test on Aquaholder superabsorbent under different water supply conditions on Maize and Winter Barley

GEP COMPLIANCE STATEMENT

I, the undersigned, declare that the report reflects fully and accurately the procedures used and the raw data generated in the test facility during the trial.

This trial was conducted in compliance with the Good Agricultural Practices and the Good Experimental Practices.

The original raw data are stored for a 5 years period.

A copy of the test report is stored in the headquarters of SGS Hungária Kft. in Budapest for a 5 years period.

Budapest, 10-Jun-2019

Juhász István János

Study director

SGS Hungaria Kft.

Pewas Aquaholder superabsorbent seed treatment sprout test on Maize and Winter Barley

Trial ID: Pewas HUN 2019 Location: Hungary, Cegléd Trial Year: 2019
Protocol ID: Pewas HUN 2019 Investigator: Istvan Juhasz
Project ID: Study Director:
Sponsor Contact:

General Trial Information
Investigator: István János JUHÁSZ Principal Investigator

Discipline: H/ seed treatment herbicide/saf
Trial Status: E established **Trial Reliability:** GOOD
ARM Trial Created On: May-31-2019
Initiation Date: May-27-2019 **Planned Completion Date:** May-31-2019
Completion Date: May-31-2019

Trial Location
City: Szolnok HUN Hungary
State/Prov.: Jász-Nagykun-Szolnok
Postal Code: H-5000 **Climate Zone:** EPPOSE EPPO South East

Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
Set of specific tests of selected seed germinations

Description of the organisation: PEWAS is a Slovak company focused on ecological chemistry innovation, research and development of new solutions in agriculture and various industries.

Our innovative product superabsorbent can assist farmers to increase yields while using less water and fertilizers. Our new solutions are efficient and environmentally friendly.

Request:

1) germination test in paper – corn
2) germination test in paper – wheat
3) aquarium" test under 3 watering circumstances and create a time -lapse video about the development – corn
4) aquarium" test under 3 watering circumstances and create a time -lapse video about the development – wheat

SEED GERMINATION TEST: Under the standard MSZ 6354 -3: 2008

50-50 pieces of healthy seeds were selected and placed into paper filter sheets. The sheets were wetted with water and packaged into plastic bags. The packages stored in 22°C for 4 days. Sprouted seeds were assessed and counted in each treatments after unpack. The number of the sprouted and non sprouted seeds were compared with analysis os variance.

GROWING TESTS IN PODS:

3 transparent pods (aquvarium) were used for the trials. Pods were filled with commercial floral soil. 10 untreated and treated seeds were set into uniform depth on the opposite sides. The first pod was non irrigated. Initial watering was carried on only for activate the seeds. The second pod was irrigated when the surface of the soil became dry. The third one was irrigated regulary. -10

The water amounts were calculated under the top surface of the pods. 10mm equivalent amounts (150ml) were injected with a syringe and needles to the zone of the seeds and root system. (Flooded water runs into the bottom of the pods.)

The sprouting and emerging were captured by photocamera. A photo was taken in every 10 minutes. The whole emergence was captured. The pictures were merged into a timelapse video.

Investigator: István János JUHÁSZ **Title:** Principal Investigator
Organization: SGS Hungária Kft.
Address: Sirály u. 4 **Phone No.:** +3613093339
City+State/Prov: Budapest/Pest County **Mobile No.:** +36308618906
Postal Code: H-1124 **E-mail:** istvan.juhasz@sgs.com
Country: HUN Hungary

Crop Description
Crop 1: ZEAM Zea mays Corn **BBCH Scale:** BCOR
Crop 2: HORVW Hordeum vulgare Winter barley **BBCH Scale:** BCER

SGS Hungaria Kft.

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GROWING TESTS IN PODS:

3 transparent pods (aquvarium) were used for the trials. Pods were filled with commercial floral soil. 10 -10 untreated and treated seeds were set into uniform depth on the opposite sides. The first pod was non irrigated. Initial watering was carried on only for activate the seeds. The second pod was irrigated when the surface of the soil became dry. The third one was irrigated regulary.

The water amounts were calculated under the top surface of the pods. 10mm equivalent amounts (150ml) were injected with a syringe and needles to the zone of the seeds and root system. (Flooded water runs into the bottom of the pods.)

The sprouting and emerging were captured by photocamera. A photo was taken in every 10 minutes. The whole emergence was captured. The pictures were merged into a timelapse video.

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Crop Description
Crop 1: ZEAM Zea mays Corn **BBCH Scale:** BCOR

Crop 2: HORVW Hordeum vulgare Winter barley **BBCH Scale:** BCER

SGS Hungaria Kft.

Pewas Aquaholder superabsorbent seed treatment sprout test on Maize and Winter Barley

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Protocol ID: Pewas HUN 2019 Investigator: István Juhasz
Project ID: Study Director:
Sponsor Contact:

Crop Code			HORVW	ZEAMX
Crop Name			Winter barley	Corn
Rating Date			May-31-2019	May-31-2019
Part Rated			SEED C	SEED C
Rating Type			COUNT	COUNT
Number of Subsamples			1	1
Assessed By			István János J>	István János J>
Data Entry Date			May-31-2019	May-31-2019
Rating Timing			A1	
Days After First/Last Applic.			4 4	4 4
Trt-Eval Interval			4 DA-A	4 DA-A
Trt No.	Treatment Name	Appl Code	1	2
1	Untreated	A	49,3 a	49,8 a
2	Aquaholder	A	48,0 a	46,5 b
LSD P=.05			2,09	1,69
Standard Deviation			1,21	0,98
CV			2,48	2,03
Levene's F			0,097	3,857
Levene's Prob(F)			0,766	0,097
Skewness			-0,1051	-0,5341
Kurtosis			-1,9223	-1,2941
Treatment F			2,143	22,043
Treatment Prob(F)			0,1936	0,0033

Crop Code
HORVW, BCER, Hordeum vulgare, Winter barley = US
ZEAMX, BCOR, Zea mays, Corn = US
Part Rated
SEED = seed
C = Crop is Part Rated
Rating Type
COUNT = count
Assessed By
István János Juhász = JIJ
Rating Timing
A1 = 1st Assessment According to Trial Schedule

Trial Comments

SEED GERMINATION TEST:

Test was started on 27th May, 2019. Assessment was carried on 31st May, 2019.

Winter Barley:

The sprouting test was set in 4 replicates. The average number of the sprouted seeds was 49.25 in the untreated. The average of the sprouted seedlings was 48 in the Aquaholder treatment. There was not significant difference between the treatments. No inhibitor effect detected. The seedlings looked healthy in both treatments. (see on attached photos)

Maize:

The sprouting test was set in 4 replicates. The average number of the sprouted seeds was 49.75 in the untreated. The average of the sprouted seedlings was 46.50 in the Aquaholder treatment. There was significant difference between the treatments. Moderate inhibitor effect detected. The radicles and sprouts of the seedlings were shorter in the Aquaholder treatment. There were some seeds which could swell only. The colour of the paper around the seeds was dark grey instead of red in the Aquaholder treatment. (see on attached photos)

GROWING TESTS IN PODS:

3 transparent pods (aquvarium) were used for the trials. Pods were filled with commercial floral soil. 10 untreated and treated seeds were set into uniform depth on the opposite sides. The first pod was non irrigated. Initial watering was carried on only for activate the seeds. The second pod was irrigated when the surface of the soil became dry. The third one was irrigated regulary. -10

The water amounts were calculated under the top surface of the pods. 10mm equivalent amounts (150ml) were injected with a syringe and needles to the zone of the seeds and root system. (Flooded water runs into the bottom of the pods.)

The sprouting and emerging were captured by photocamera. A photo was taken in every 10 minutes. The whole emergence was captured. The pictures were merged into a timelapse video.

SGS Hungaria Kft.

Pewas Aquaholder superabsorbent seed treatment sprout test on Maize and Winter Barley

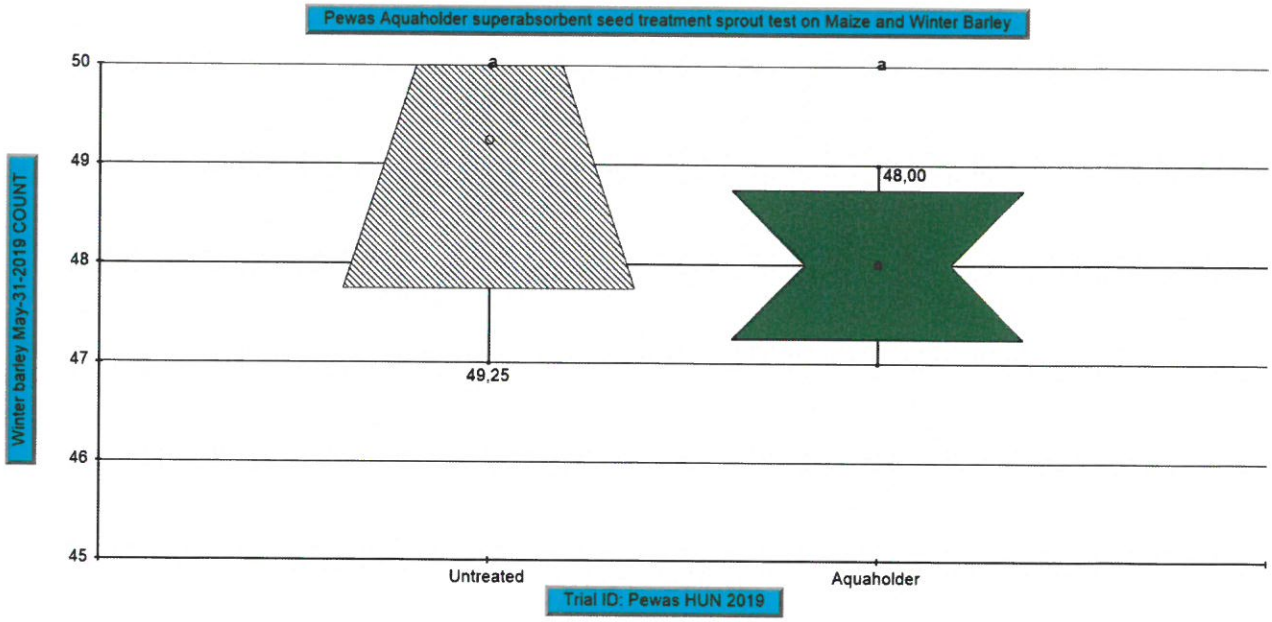
Trial ID: Pewas HUN 2019 Location: Hungary, Cegléd Trial Year:2019
Protocol ID: Pewas HUN 2019 Investigator: Istvan Juhasz
Project ID: Study Director:
Sponsor Contact:

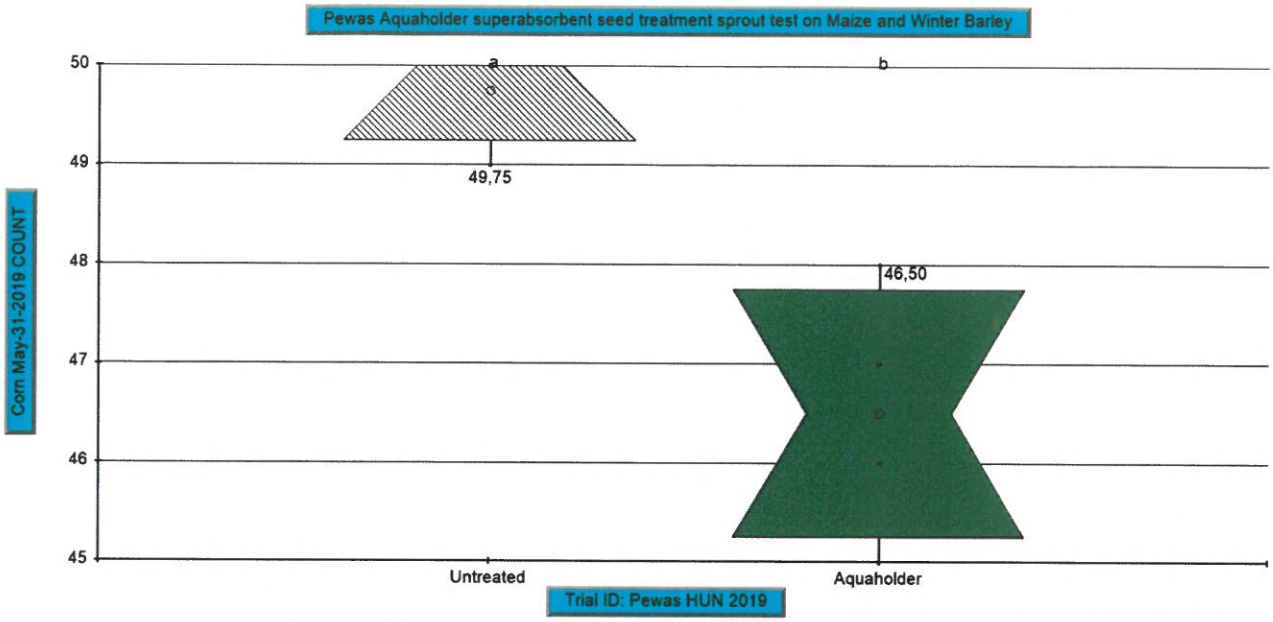
Winter barley:

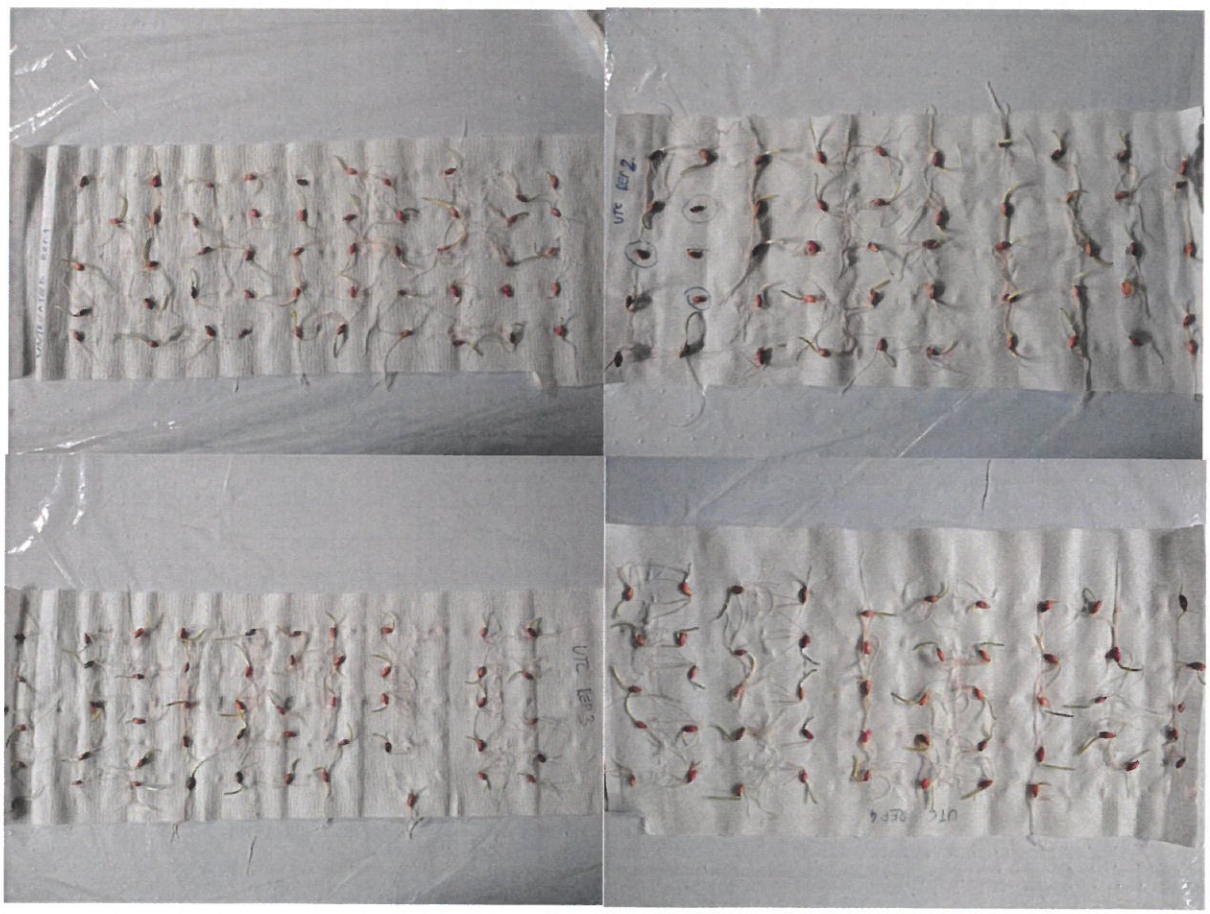
The duration of the test was 7 days. (28 -May-19-04-Jun-19) There is no difference among the treatments. There was some delay in the high irrigation plot, but there was not visible diference in the end. All plants were healthy and well developed. The seeds sprouted and emerged even under the leak of extra irrigation.

Maize:

The duration of the test was 9 days. (28 -May-19-06-Jun-19) Maize growed 2 more days. The superabsorbent slowed down the development especially under dry condition. The less developed plant were visible in the first pod. (NON irrigated treated) The plants in the aquaholder non irrigated pod was undeveloped and distorted. The top leaves coloured dark gray. The plants in the other Aquaholder treatmnets were well developed even under low irrigation and high irrigation.

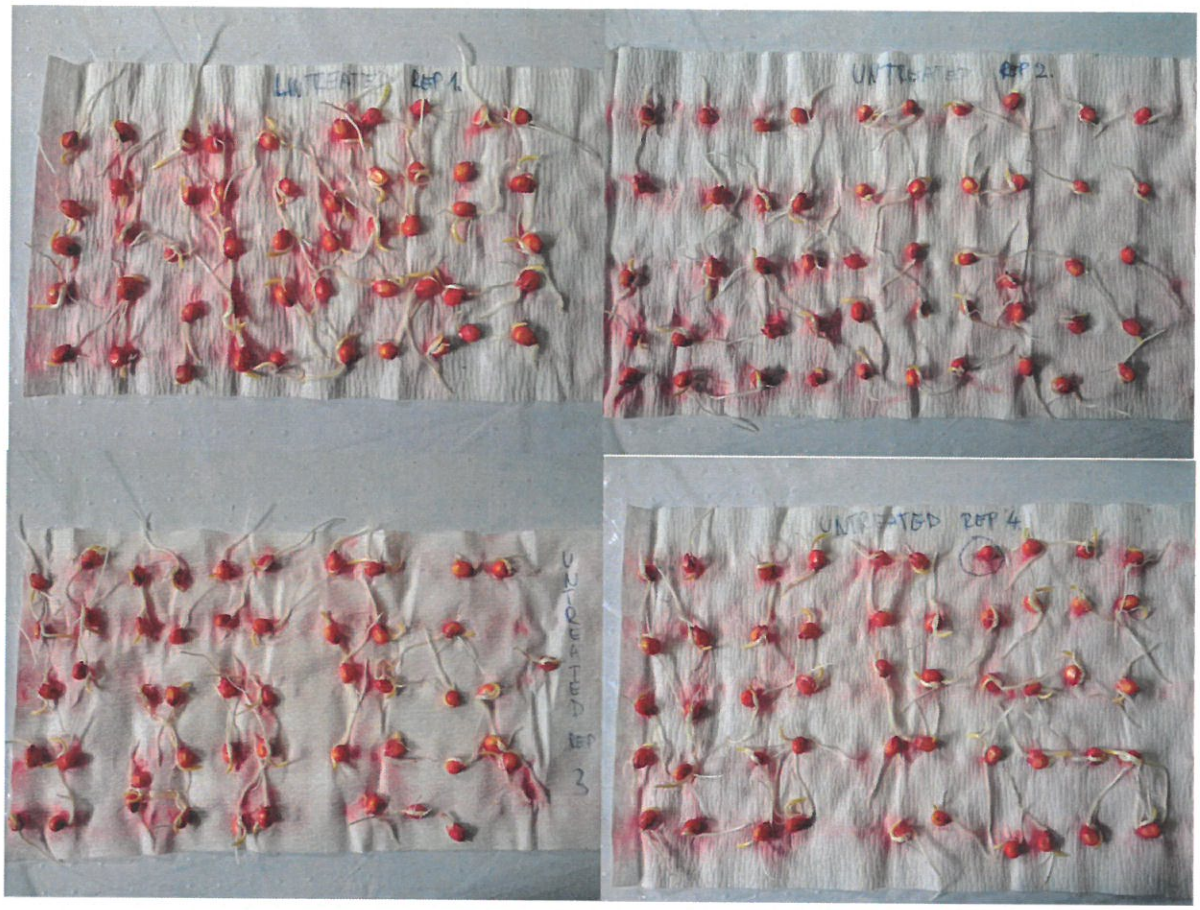




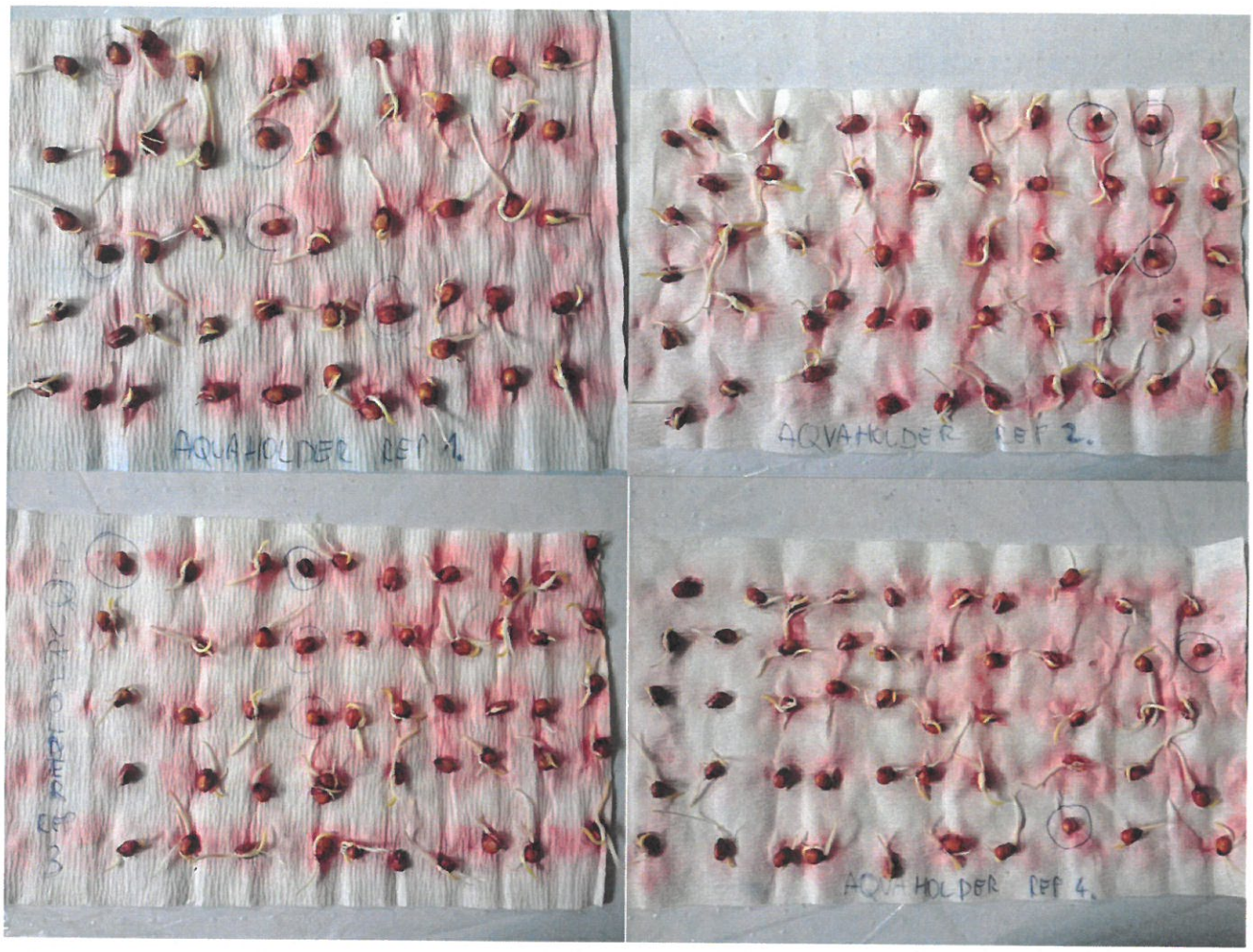


Untreated on winter barley

Aquaholder treatment on winter barley

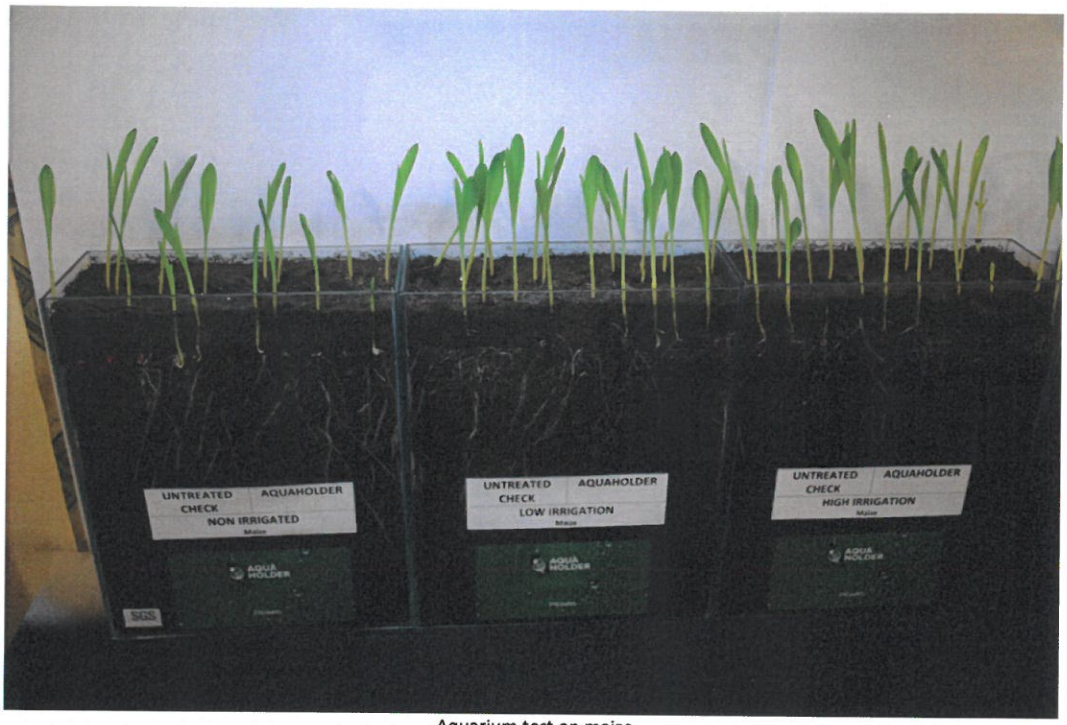


Untreated on maize

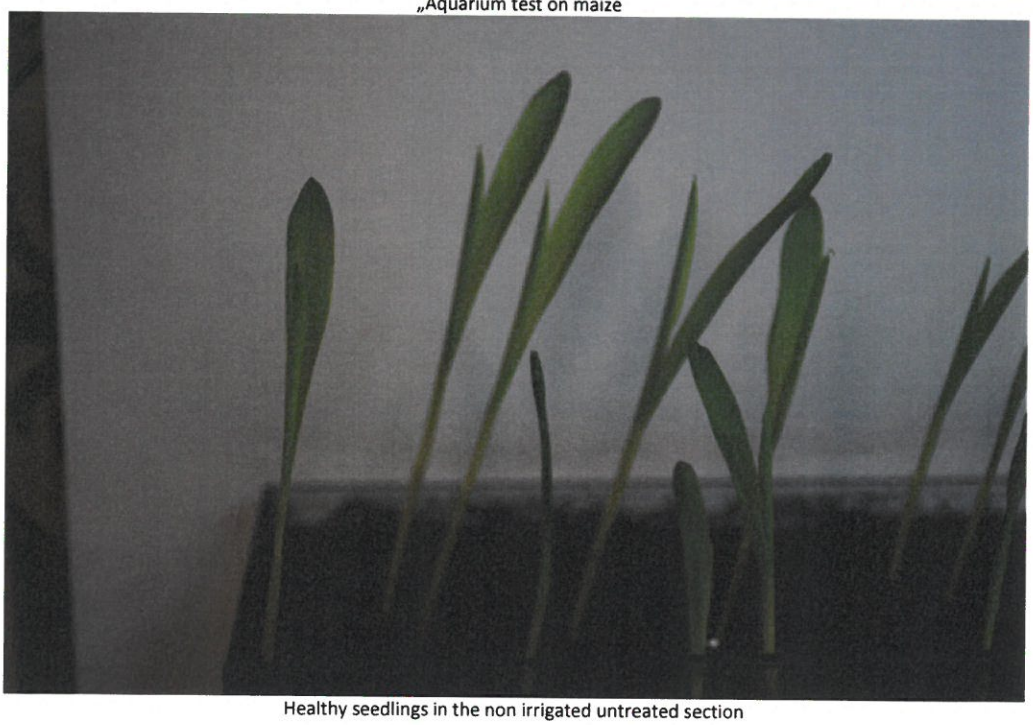


Aquaholder treatment on maize

Non sprouted seeds in Aquaholder treatment



„Aquarium test on maize



Healthy seedlings in the non irrigated untreated section

Distorted plants in the non irrigated Aquaholder section

„Aquarium" test on winter barley

Based on the results of the local inspection the competent authority concluded that the client's testing facility does not meet the requirements concerning the efficacy trials specified in Decree 89/2004 and in the Decision Nr. 04.2/10555-4/2014 it calls the client to fill the data gap.

Article 22 of Decree 89/23004 (5) Based on request, the competent authority shall make local inspections at the testing facility and decide on the GEP qualification of the testing facility. The decision shall include the product categories and the cultivation categories for which the testing facility obtained the GEP-certificate.
(6)The validity of GEP-certification is 2 years in case of the first request and maximum 5 years in case of renewal of the certification.
(7) A fee laid down in specific legislation shall be paid for the GEP-certification procedure.
(8) The testing facility having GEP-certification shall notify the competent authority, within 15 days, about any important changes concerning the certified activity of the testing facility.
(9) The competent authority shall randomly control the testing facility having GEP-certification. If it is found that the testing facility does not meet the relevant GEP requirements, the competent authority may suspend the activity related to the category specified in this Decision for maximum 2 months or may revoke the GEP-certificate. If during the official inspection it is established that some details are missing in relation to a trial, the competent authority responsible for authorization may exclude the trial, depending on the extent of missing data, from those that may be accepted for authorization.

Client filled the missing data gap and reported on it in the letter of 24 September 2014, therefore I made the Decision as specified in the first part.

The fee of the present procedure was established in accordance with point 8.19.2 of Annex 1 to the *Decree 63/2012. (VII. 2.) VM on the extent of administrative servicing fees due for the procedures by the agricultural administrative bodies of the National Food Chain Safety Office and the county government offices and on the rules of paying the administrative servicing fees.*

The client is obliged to notify the competent authority, within 15 days, of any important changes concerning the certified activity of the testing facility.

I inform you that the present certification is without prejudice to either the licences concerning the operation/follow-up of activity laid down in other provisions of legislation or the client's obligation for obtaining them.

Respect of the provisions laid down in the legislation on GEP certification and in this Decision shall be randomly controlled by my competent authority.

If during the official inspection it is stated that the testing facility does not respect the relevant GEP requirements, the competent authority may suspend the activity related to the category specified in this Decision for maximum 2 months or may revoke the GEP-certificate. If during the official inspection it is found that some details are missing in relation to a particular trial, the competent authority responsible for authorization may exclude the trial, depending on the extent of missing data, from those that may be accepted for authorization.

I made this Decision within my jurisdiction laid down in Article 3 paragraph (1) and Article 5 point c) of *Government Decree 22/2012. (II. 29.) concerning the National Food Chain Safety Office*, Article 3, Article 22 paragraph (1) of Decree 89/2004. I made this Decision in compliance with Articles 71 paragraph (1) and Article 72 paragraph (1) of *Act CXL of 2004 on general rules of administrative official procedure and service* (hereinafter: Act CXL of 2004).

I provided the possibility of judicial review in compliance with Article 100 paragraph (1) point c) and paragraph (2), Article 109 paragraph (1) point a) of Act CXL of 2004, and Article 330 paragraph (2) of *Act III of 1952 on Civil Procedure*.

dr. Márton Oravecz
president

Decision is made in two copies:
- Client (with acknowledgement of receipt)
- Archives