

Efal Agri
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January 28, 2020.

Dear Sir,

Re: MICROBIOLOGICAL TEST OF SEEDS

Hereby, please find results of 1 tomato seeds sample, brought to our laboratory on January 16, 2020.

Transportation: The sample was received in the laboratory without any means of protection from temperature changes.

The sample was tested for:

- Pseudomonas syringae* pv. *tomato* (Pt) - *2 replicates of 1250 seeds
- Pseudomonas corrugata* (Pc) - *2 replicates of 1250 seeds
- Erwinia carotovora* (Er) - *2 replicates of 1250 seeds
- Xanthomonas campestris* pv. *vesicatoria* (Xv) - *2 replicates of 1250 seeds
- Clavibacter michiganensis* sp. *michiganensis* (Cmm) - *2 replicates of 1250 seeds
- Tobamoviruses (TMV, ToMV, ToMMV, **ToBRFV) -**** 8 replicates of 100 seeds each, by the bioassay method.
- Pepino Mosaic Virus (PepMV) - ****8 replicates of 100 seeds each, by the ELISA method.
- Potato Spindle Tuber Viroid (PSTVd) -***** 3 replicates of 100 seeds by the PCR method.
- Nepoviruses – *****1 replicate of 100 seeds
- Fusarium oxysporum* – *****100 seeds

The tests were performed according to:

- S.O.P 50: "Testing seeds for viruses by the ELISA method".
- PepMV**: Prime, Lot: P81886/ P81915, Ex: 02/21
- S.O.P 54: "Testing Tomato and Pepper seeds for Pt, Pc, Xv, Cmm, Er"
- S.O.P 56: "Detection of infectious Tobamoviruses in tomato and pepper plants and seeds" according to: ISTA 7-028 (2019), ISHI-Veg (Sep 2019) "Detection of Infectious Tobamoviruses in Tomato seed" and " Detection of Infectious Tobamoviruses in Pepper seed".
- S.O.P 80: "Detection of Viroid from the Pospiviroid group including Potato Spindle Tuber Viroid (PSTVd) in plants and seeds by RT-PCR or qPCR method".
- S.O.P 83: "Detection of Fungi in seeds for: *Fusarium*, *Didymella*, *Phoma*, *Lasioidiplodia*, *Macrophomina*, *Colletotrichum*, *Alternaria*, *Stemphylium*, *Cladosporium*, *Phytophthora*, *Verticillium*, *Botrytis*, *Ascochyta*, *Bipolaris*, *Sclerotinia*".
- S.O.P 103: "Detection of viruses in Solanaceae seeds".

RESULTS:

| Lab No. | Sample | Pt | Pc | Er | Xv | Cmm |
|---------|---|----------|----------|----------|----------|----------|
| 314 | Tomato seeds MIX 3 50969 5872061 50970 5900973 | Negative | Negative | Negative | Negative | Negative |

| Lab No. | Sample | Tobamoviruses | PepMV | PSTVd | Nepoviruses | <i>Fusarium oxysporum</i> |
|---------|---|---------------|----------|----------|-------------|---------------------------|
| 314 | Tomato seeds MIX 3 50969 5872061 50970 5900973 | Negative | Negative | Negative | Negative | Negative |

Comments:

- **The lab has PPIS recognition/certification for this test but not accreditation from ISRAC.
- * according to ISHI protocol the test requires 2 replicates of 1250 seeds each.
- *** according to ISHI protocol the test requires 12 replicates of 250 seeds each by the Bioassay method.
- **** according to ISHI protocol the test requires 12 replicates of 250 seeds each by the ELISA method.
- ***** according to ISHI protocol the test requires 3 replicates of 1000 seeds each by the PCR method.
- ***** according to ISHI protocol the test requires 1 replicates of 250 seeds.
- ***** according to ISHI protocol the test requires 400 seeds.

1. ISRAC is not responsible for the testing results conducted by the laboratory and the laboratory's accreditation is not considered as an approval of ISRAC or different party related to the assessed.
2. This document must be referred to entirely and copying of any part of it to other documents is forbidden
3. The data in this certificate reflect results that are valid for analyzed samples only as received in the lab.

End of certificate.

Sincerely yours,



Isaac Assouline,

Head Microlab Laboratories (99) Ltd.