A Brief Note: Potassium phosphite against Phytophthora

Phosphorus fertilizers are generally supplied to plants as salts of phosphoric acid (H_3PO_4). When phosphoric acid is neutralized by potassium hydroxide (KOH) it forms the phosphate fertilizer, potassium phosphate (KH_2PO_4). However, if phosphorous acid (H_3PO_3) is neutralized with KOH, it forms the salt of phosphorous acid, potassium phosphite (KH_2PO_3), also known as phosphite or phosphonate. Phosphite fertilizers are available commercially and are labeled as phosphorus supplements for foliar or soil treatment to nursery, turf, and landscape crops.

The scientific name "Phytophthora" (pronounced "fy-tof-thor-a" - derived from Greek "phyton" meaning "plant" and "phthora" meaning "destruction"). *Phytophthora* is the fungi that cause some of the most widespread and serious root rot and foliar blight diseases on plants. There are so many crop plants from vegetables (e.g. late blight of potato) to trees (e.g. sudden oak death of Oak).

Enough evidences are already researched and found out the fungicidal value of potassium phosphite with respect to phytophthora fungus. However these findings are presented in different scientific methodologies little difficult to understand. Hence the present investigations are undertaken to find out the effect of phosphite on phytophthora an *In vitro* study and presented in easily understandable format.

Main objective of this study is,

- To determine the phosphite fertilization on the inhibition of the development of Phytophthora disease.

- Whether phosphonates can replace phosphates as a source of phosphorus with the additional benefit of disease control.

Treatments are different concentration of potassium phosphite add onto the agar culture media where phytophthora spores are placed and grown *In vitro* environment.

After a month of inoculation the mycelia growth were recorded and expressed in percentage, length and in image formats.

RESULTS

Table 1. **Effect of potassium phosphite on mycelia growth of Phytophthora (%)**
In-vitro studies

Control	0.75 ml	1.25 ml	2.5 ml
100	68.24	76.47	48.24
100	62.35	65.88	54.12
100	54.12	36.47	28.24
100	72.94	58.82	30.59
100	70.59	50.59	43.53
100	49.41	67.06	58.82
100	88.24	87.06	35.29
100	68.24	60.00	34.12
100	66.76	62.79	41.62

Fig 1. **Inhibition of phytophthora mycelia under different potassium phosphite Concentrations**

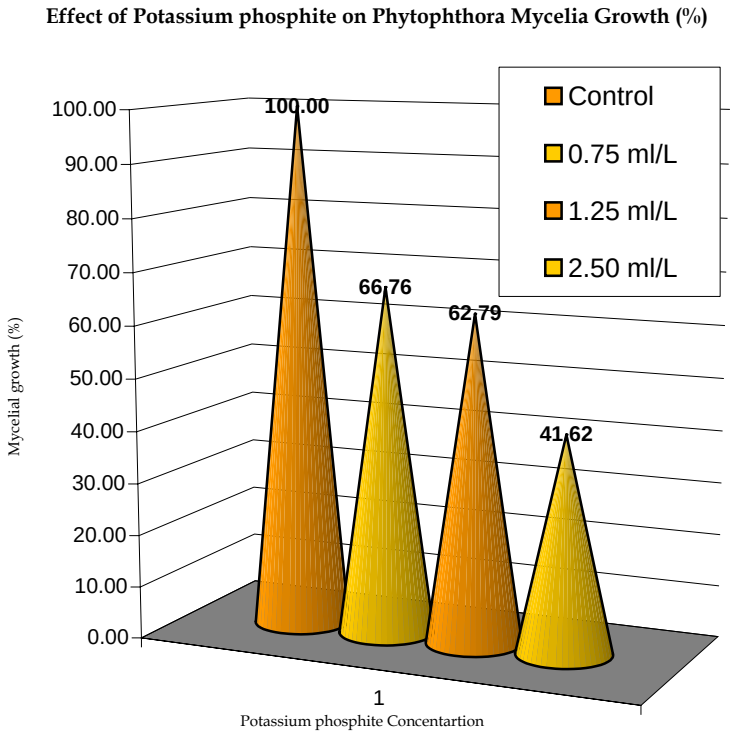
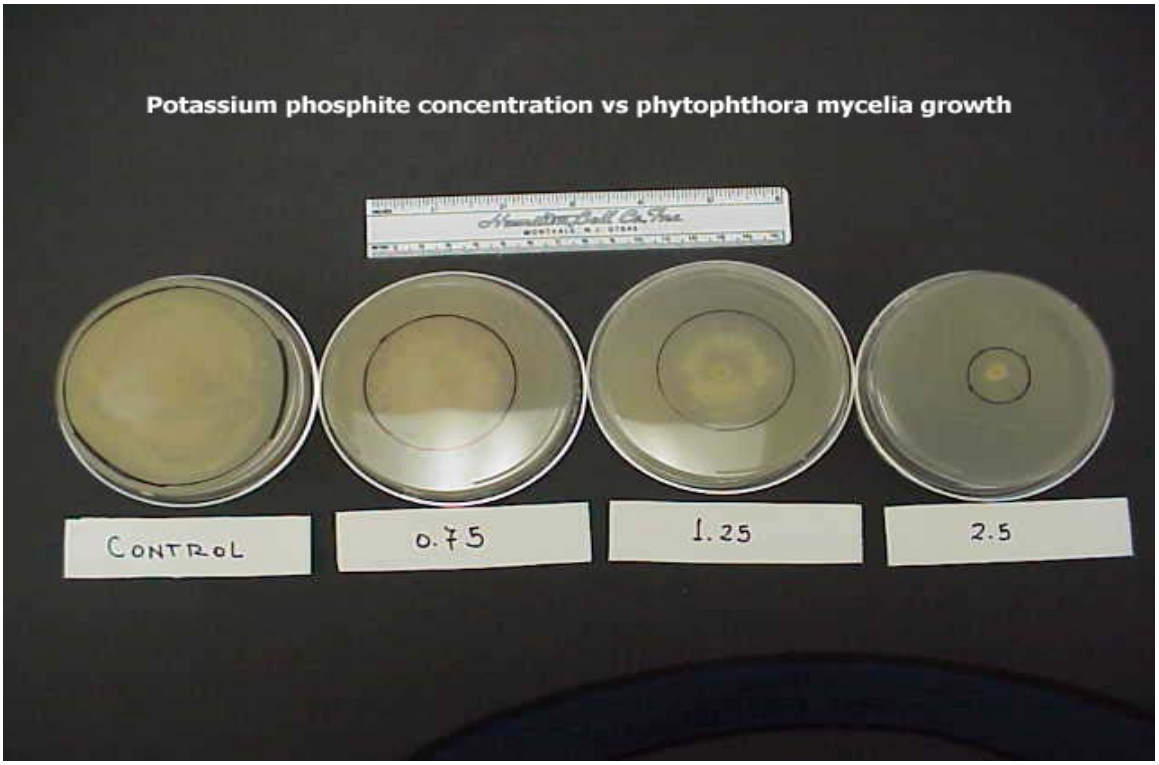


Fig 2. <u>Inhibition of phytophthora mycelia observed in petri-dishes (*In vitro*observation)</u>



Summary

Results were clearly indicated that the inhibitory reaction on phytopthora spores and it was evident in mycelia in terms of growth as indicated in Figure 3. Research into phosphite and its application is continuing. Among the areas requiring is the refinement of application rates in conjunction with phosphorus fertilizer requirements of crop plants, time and frequencies of application for different soil type. From this investigation, it appears that there could be substantial benefit of controlling phytophthora fungus by using the potassium phosphite.

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