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The field multiplication of basic (G-0) seed-potato stocks in Brazil is now threatened by withefly-transmitted viruses: The Sprout/Seed-Potato Technology can address it.

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Introduction: In Brazil**,** basic class (G-0) tuber/seed-potato lots, come from laboratory or imported. Due to high costs, multiplied for at least 3-generations (G-1, G-2, G-3), must be made under official norms (IN-MAPA 12/16-05-2005). Tubers from G-0 lots can generate hundred tons of sprouts, at time of field planting. Instead of discarding these sprouts, the Sprout/Seed-Potato Technology uses the dominant sprouts, usually produced during storage: 1-3/tuber, >5cm, which can be enhanced if tubers are stored for 2-3 weeks in the dark, at >15<20°C and 85% RH, as prime material for producing additional, equally health (virus-free), minituber/seed-potato stock (Souza Dias, 2011; patent INPI No. PI 0604078-0; demo CD: www.FUNDAG.br). Therefore, the Sprout/Seed-Potato Technology (Figuras 1- A-D) can be easily integrated into basic seed-potato production; reducing field multiplications/degeneration due to insect-transmitted virus (aphids and whiteflies).

Whitefly-transmitted viruses = fast seed-potato degeneration: Historically, aphid-transmitted viruses restrained field seed-potato multiplication, such as *Potato leafroll virus* - PLRV and *Potato virus Y* - PVY, various strains, mainly PVYntn. However, since mid 2000's, there has been frequent occurrence of nearly uncontrolled infestations of whitefly (*Bemisia tabaci*). More recently, mainly in warm seed-potato regions of Brazil, the current PVY prominence, as hastening seed-potato degeneration, has been challenged by whiteflies (*B. tabaci*, *Trialeurodes vaporariorum,* and *T. abutiloneum)* transmitting a Crinivirus species: *Tomato chlorosis virus* - ToCV, causing PLRV-like symptoms (Foto 2-D) (Freitas, et al. 2012). ToCV prevalence in imported (G-0) seed-potato stocks would explain the crescent-shaped record and previous suspicion that PLRV was returning to prominence in Brazil. It is worth to notice that despite high whiteflies infestation in potato crops, an increase in begomovirus incidence has not been observed in Brazil.

The challenge of field multiplication x maintenance of virus-free tuber/seed-potato stocks: Whitefly-transmitted virus has potential for an even faster field degeneration of G-0 basic tuber/seed-potato stocks (imported or national), due to its epidemiology linked to high infestations. Therefore, a most practical response to address the current need to reduce field generations from a G-0 tuber/seed-potato stocks is to increase its multiplication rate under aphid-whitefly proof screenhouses. For that procedure, it is recommended herein incorporation of the Sprout/Seed-Potato Technology as an additional, official seed-potato production alternative. From the hundreds tons of sprouts, that can or have been removed before G-0's field plantings, an extra, equally healthy (virus-free) minituber/seed-potato lot can be produced.

In conclusion: Favoring this proposal, the Sprout/Seed-Potato Technology should be contemplated as an alternative seed-potato production system in developed and developing countries. Brazil, which is undergoing seed-potato norms revision (http://members.wto.org/crnattachments/2011/sps/BRA/11_1133_00_x.pdf), could be a world leader in this innovative basic seed-potato production system, considering to be approached as:
In developing countries, this system could replace or add to efforts on establishment of local tissue culture laboratories; and In developed nations, seed-potato producers and exporters can take advantage of the Sprout/Seed-Potato Technology by introducing it to conventional seed-potato

market, as well as to produce healthy (virus-free) heirloom and specialty seed-potato. In addition, the reduced weight on international shipment and reduced risk of soil-tuber borne pathogen movement favor sustainable-organic farmers and small growers in developed and developing countries (Figuras. 2 A-C).


A


B


C


D

Figures 1- The Sprout/Seed-Potato applied to G-0 imported tuber/seed-potato stocks (cv. Agata): 1-3 sprouts/ tuber, planted in 150-200 sprouts/m2, can produce additional 2-4 minitubers of 20-70 mm /sprout. **A**: Basic class (G-0) imported tuber seed-potato stock, cv Agata, from 2010, showing huge sprout growth, which were hand removed before planting for field multiplication; **B**: The hundred of thousand sprouts removed from the G-0 tubers as shown in **Fig. 1- A**, were planted in 200 cm3 pots with fertilized (20g 4-14-8) horticulture substrate, into insect-proof screenhouses; **C**: At 45 days after sprout planting, as shown in Fig.1-B, over 95% germination of the sprouts, confirms expected excellent general health of the plants (virus-free) as expected for the G-0 tuber seed-potato stock; **D**: At 75-90 days, two to four virus-free minituber/seed-potato (size above two cm , considered as maintaining class G-0) can be harvested per sprout-plant.


A


B

C


D

Figures 2 - **A**: The Sprout/Seed-Potato Technology has been evaluated at the Univ. of Wisconsin-Madison (USA) towards conventional and sustainable-organic basic seed-potato production; **B**: sprouts removed from class basic tuber seed-potato lot (cvs. APTA-IAC, at UPD-Itararé), sorted by cvs and ready for minituber/seed-potato production into insect-proof screenhouse, like shown in **Fig. 2-A**, or **C**: packaged into zipper plastic bags, on amounts of 20-50 sprouts in each, for national or international (experimental export), shipments, as basic (G-0) seed-potato stocks, which has been considered in China, Mozambique and Benin, as an affordable and sanitary safe movement toward supply of their needs of virus and pathogen free basic seed-potato stocks; **D**: PLRV-like secondary symptoms due to whitefly-transmitted Crinivirus (ToCV: serologically - kits DSMZ, Braunschweig, Germany- , and molecularly - Freitas et al., 2012 - confirmed), shown in potato plants as upward leaf-roll of crispy-like bottom leaves (usually seem from 35-45 days after planting of infected tuber/seed-potato - perpetuation symptoms).

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