Methyl Bromide Critical Use Nomination for pre-plant soil use (open field or protected environment)

Form 1. For both New or continuing nominations (Re-nominations)

NOMINATING PARTY:
CANADA

NAME (AS PER NAMING CONVENTION, Para 3.5.2 of Handbook)
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BRIEF DESCRIPTIVE TITLE OF NOMINATION:
Methyl bromide as a pre-plant fumigant for soil used to grow strawberry runners on Prince Edward Island (PEI), Canada.

CROP NAME (SPECIFY OPEN FIELD OR PROTECTED):
OPEN FIELD - Westech Agriculture Ltd. (Westech) operates a strawberry plant nursery in PEI growing plants for the export market, primarily the United States of America (USA).

QUANTITY OF METHYL BROMIDE REQUESTED IN THE NOMINATION:
5,017 kg of pure methyl bromide for the 2023 calendar year, which is the equivalent of 7,488 kg of Terr-O-Gas® (67:33). This represents a reduction of 244 kg of pure methyl bromide from the quantity approved annually for the period 2013 - 2020 (5,261kg) and is the same quantity as nominated and approved for 2022.

While the grower is making progress towards the adoption of indoor soilless production for G2 runner tips and continues to optimize the existing greenhouse operations to increase indoor soilless runner tip production, the prototype greenhouse alone does not displace the entirety of the previous reduction of 244 kg (2021) from the quantity required to fumigate the entire acreage (5,261). The majority of the 244 kg reduction in the quantity of methyl bromide results in fumigating a smaller total acreage across all stages of production and an associated direct loss of production by the grower.

REASON OR REASONS WHY ALTERNATIVES TO METHYL BROMIDE ARE NOT TECHNICALLY AND ECONOMICALLY FEASIBLE:

1. Chemical Alternatives
Many feasible chemical alternatives to methyl bromide are not federally registered in Canada (e.g. those containing 1,3-D), and as such are not permitted and/or available to the grower. For those chemical alternatives that are federally registered (e.g. chloropicrin, metam sodium and metam potassium), the Government of PEI will not permit their use under the Pesticide Control Act due to concerns related to groundwater contamination. Please refer to Section 15 for more information.

2. Soilless Cultures
Haygrove high tunnel multi-span:
In July 2013, Canada submitted a detailed analysis of the economic feasibility of the Haygrove soilless culture system in PEI, comparing a business as usual scenario with the implementation of a soilless system involving Haygrove high tunnel multi-span – see Part E and Annex 1. While the

study is eight years old, the cost-estimates associated with the Haygrove high tunnel multi-span system and the business-as-usual scenario remain valid.

The analysis clearly shows that a shift to Haygrove soilless cultivation would mean a significant change in production methods and due to significant increased costs would result in near term market disruption for the grower in PEI, while only serving to address methyl bromide used for G1 foundation stock (405kgs). As such, the adoption of a Haygrove soilless culture system for foundation stock production in PEI is not economically feasible and therefore the grower is no longer pursuing this option.

Potting Mix Slabs:
The grower has conducted repeated trials to examine the feasibility of producing G2 runner tips using plant bags (peat) containing locally produced potting mix (Professional Mix VPW 30). Results from 2016 and 2017 (see Section 16 and Appendix 2) demonstrate that peat-bag growing of G2 runner tips is not feasible for any of the three varieties tested. The grower could not correctly manage strawberry plant growth and runner production in rainy periods during the summer growing season with porous, woven peat bags and therefore the grower is no longer pursuing this option.

Botanicoir Precision Plus growbags:
The grower has been conducting trials to examine the feasibility of producing G2 runner tips using Botanicoir Plus Precision grow bags since 2016. Results for trials completed in 2016 and 2017 were unsatisfactory due to issues with the fertility program. These issues were addressed and in 2018 and 2019, and the grower achieved more positive results for the Chandler and Camarosa varieties.

However, in 2018 and 2019 the grower observed that soilless plants required an additional 3-4 weeks of growing time, relative to conventional plants, resulting in an additional mid-fall harvest, for which a market does not exist. In 2019, the grower constructed a greenhouse to produce soilless plants in an indoor environment, in order to overcome the delay experienced with soilless production. In 2020, the grower moved all soilless research trials into the greenhouse, concluding that because of the delay experienced and lack of markets, outdoor soilless production for G2 runner tips would not be economically viable.

As described in detail in Section 16, the results of the indoor research trials for 2020 and 2021 were quite positive. While the grower had no experience with indoor production prior to 2020, by making improvements to the process, layout and selection of varieties, they were able to increase production of soilless runner tips indoors in 2021.

However, as the costs of indoor soilless production far exceed that of conventional field-based production (see Section 24) and the shift to a soilless system will not produce higher quality runner tips, the increased costs cannot be passed on to the customer. As such, indoor soilless production must reliably exceed that of conventional methods, and/or the grower must find significant cost savings for this approach to be economically viable.

3. Plug plants
The grower does not consider plug plants as a viable alternative, since nursery stock is more productive and vigorous than plug plants grown in substrates in greenhouses. When transplanted, bare-root nursery plants become more vigorous when transplanted, due to acclimation to the

Canadian climate. Plugs are normally only used for very early crop, which represents only a small proportion of the grower's field. Plugs are also much more expensive than bare-root plants, and shipping costs are at least five times higher: a finished plug plant in North Carolina in 2013 cost the grower $235 to $250/thousand, more than all other strawberry plant types, including bare-roots (about $135/thousand), cut-offs (about $120/thousand) and frigo ($100-120/thousand). Furthermore, plug plants are not readily available in abundance in Canada.

A reference paper provided by the MBTOC by Lopez-Galarza, et al., (2010) states that "… *the plug technique has become more widespread due to generating higher profits compared with use of bare-root plants, especially after the banning of methyl bromide and despite its higher costs, which are a major restriction on the use of plug plants*." Experience in North Carolina with plugs and bare-roots does not support the conclusion that higher profits are possible with plug plants compared to bare-root fresh dug material. In fact, in the 2012-2013 season, bare-root plants from the PEI grower were earlier in ripening than plug plants of the same variety, and berry size was better with bare-roots than plugs.