METHYL BROMIDE REPLACEMENT CHALLENGES: IMPRESSIONS FROM JAPAN

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Methyl bromide (MBr) has served for more than 4 decades as a soil fumigant to mitigate soilborne plant diseases and to reduce populations of plant-parasitic nematodes, weeds and soil arthropods. It was also used for commodity and structural fumigation, as well as for quarantine or regulatory function. In 1992 it was added to the international Montreal Protocol treaty's list of stratospheric ozone depletion compounds and developed countries were required to freeze production and import of MBr at 1991 levels. At that time, the US and Japan were worldwide the largest single consumers with 25,528 and 6,107 metric tons per year, respectively. The demand for the fumigant in both countries was met mainly by domestic producers, two in the US and five companies in Japan. The mandated phase-out of MBr ended, at least on paper, in developed countries in 2005. Since the ban, critical use exemptions have been available on an annual basis for those uses that have, according to the parties to the treaty, no technical or economical feasible alternatives. For 2007 the US Environmental Protection Agency has made 6,231 metric tons or 24.4% of the 1991 baseline available for 15 crops or uses, including strawberries, tomatoes, peppers, cucurbits, orchard replants, and post-harvest uses. In contrast, Japan no longer uses MBr in strawberry and tomato production while retaining it for 6 crops including cucurbits, ginger, and pepper. Overall, critical use exemptions in Japan fell this year to 10.4% of the 1991 baseline. While predictably some other soil fumigants replaced MBr (such as chloropicrin), the overall use of fumigants in Japan has dropped dramatically. In terms of chemical nematode control, fosthiazate has been by far the most dominant non-fumigant nematicide on the market. Non-chemical management strategies focus on various combinations of cultural, physical and biological measures. With typically small field sizes and intensive cultivation, many traditional practices seem to provide satisfactory results. Crop rotation, flooding, solarization, use of organic amendments, antagonistic plants, biocontrol agents and resistant cultivars are practiced in many combinations and adapted locally by growers to fit needs, resource availability and crop management systems. Production practice and value as well as soil conditions and disease pressure by soilborne pathogens differ widely as do the efforts to develop and implement MBr replacement strategies. This presentation will touch on some of the scientific, technical and economic challenges associated with the replacement and on selected approaches that have been proposed as potential alternatives to MBr in Japan.