INTEGRATED NONCHEMICAL APPROACH – A VIABLE OPTION OF METHYL BROMIDE ALTERNATIVE IN THE LEBANON VEGETABLE PRODUCTION

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An investment project of UNDP to phase out 218.5 ODP tones of methyl bromide in Lebanon, for over five years, in the sectors of vegetables, cut flowers, and tobacco production was initiated in the year 2002. This project implemented the technical, social and economic feasibility of methyl bromide alternatives for vegetables, cut flowers and tobacco production in Lebanon in combination with the integrated pest management system. The main objectives of the project are to phase out 310.2 M tons (186 ODP tons) of methyl bromide, of which, 257.8 metric tons in the vegetables sector (573 hectares), 28.4 tons in the cut flowers sector (63 hectares), and 24 tons in the tobacco sector. The vegetable sector was identified as the most crucial sector for the project. This project will achieve complete phase out of methyl bromide in Lebanon by year 2007, in concert with a second project, being implemented by the Ministry of Environment of Lebanon in coordination with UNIDO, that targets the phase out of 84 metric tones of methyl bromide consumed in the strawberry sector.

During its first two years (2002 to 2003) the UNDP project has successfully achieved phase out of 28.5 and 36 ODP tons, mainly through the application of non-chemical alternatives such as soil solarization, biofumigation and grafting, making use of a single chemical alternative (1-3, Dichloropropene) in relatively rare instances. Currently, an additional quantity of 54 ODP tons are being phased out with the use of the same alternatives. One of the major successes of the project is the creation of environmental awareness among the growers and consciousness of reward from the technology on the alternatives suggested by the project. Over the past two years there has been progressive increase in the percentage of growers who have preferred adopting non-chemical alternatives (96.5%) as compared to the growers who prefer chemical alternatives (3.5%). As a result of the awareness raising approach of the project, 90 % of farmers in terms of total phase out area have chosen non-chemical alternatives that are proposed by the project. Out of the 2,049 farmers trained on the different alternative techniques, 1,689 farmers selected soil solarization (80.0%), 111 selected biofumigation (5.0%), and 180 for grafted plants (11.4%) while only 69 farmers applied the chemical 1-3, Dichloropropene (3.5%).

As a result of the enthusiasm among the growers and the constant encouragement of the Ministry of Environment, the project eliminated 65.72 ODP tons of MeBr in years 2002 and 2003, thus exceeding its initial target of 61.8 ODP tons. Various advantages in the non chemical alternatives over the conventional MBr application make the farmers to select these technologies and fit into their vegetable cropping systems. The project staff initiated farmers training sessions in the major agricultural areas of the coast. Through these sessions, groups of farmers of the same region having selected the same alternative are being acquainted with the characteristics of the alternatives, in addition to the accurate application methods of the alternatives. Among all, the most important aspects include efficiency of the technology in controlling the target pests, low

application cost, high yields, and environment friendliness to mention a few. Additionally, uniform plant growth resulting from soil solarization and biofumigation is an encouraging factor. All these factors have encouraged Lebanese farmers to take personal initiatives and apply the non chemical alternatives suggested by the project on even larger scales than those initially committed to. However, while adopting the alternative technologies in vegetable production, the project faced some constraints in the implementation process. One of the major constraints is the environmental hazard caused by traditional methods of disposal (like dumping away, burying or burning) of polyethylene sheets used in soil fumigation either with methyl bromide or a variety of its chemical and non-chemical alternatives. In addition to an estimate yearly consumption of 2,000 tons of PE in Lebanon, the Methyl Bromide Alternatives Project alone provides around 70 tons of transparent 50 microns thermal polyethylene to the farmers every year. In order to resolve this problem, a PE recycling plant having a capacity of recycling 5 tons of used PE per day has been established in an extensively agricultural area, and provided with the necessary technical information for adding a new parallel line to the factory. Series of farmers training sessions were organised in different regions of the country and through this training program, farmers were encouraged to return the used PE to the recycling plant and a compensation plan was elaborated to reimburse farmers. The Project recollected 20 tons of used PE initially distributed to the farmers by the project and used for soil solarization and the farmers providing used PE will be compensated by the plant at a certain rate/ton. This initiative created a new opportunity for the industrial sector. Current project not only provide the assistance to Lebanon but also to the neighboring countries. In this respect, the project has recently received the visit of a delegation of Jordanian farmers and owners of plant nurseries, and introduced them the grafting technique of vegetable plants through site visits and demo tours.

The project tackled one more environmental issue, caused by the burning of plant residues at the end of each season. To overcome this problem the project purchased 2 chopper-shredder machines and made them available to the farmers of all regions. Training sessions were organized to get farmers acquainted with the benefits of using natural compost as soil amendment. Farmers have been trained on using the choppers, in addition to the composting steps and techniques. In a matter of few months, several tons of tomato and cucumber plant residues have been composted and added to the soil. This initiative also helped farmers avoiding the purchase of preparatory organic fertilizers, thus reducing production costs by 5-7%. In conclusion, the Lebanese project is not only exceeding its yearly phase out targets, but it is being able to replace methyl bromide with 100% environment friendly non-chemical alternatives in more than 96% of the cases, with only minimal use of 1-3, Dichloropropene, the single chemical alternative applied by the project.