**Effect of some environmental and agricultural factors on biodegradable-drip irrigation tubes**

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### Abstract

The efficient use of irrigation systems has grown over the years due to water shortage and the need to optimize food production using minimum amount of water. Since removing the irrigation laterals at the end of the crop season (especially for vegetables) is expected to require extensive and challenging efforts from farmers and agricultural engineers, It would be desirable to use biodegradable irrigation drip lines that would allow ploughing of these materials after the end of the cultivation season without the need to remove the tubes or any environmental impacts.

In this study, the engineering properties of two different types of biodegradable drip tubes were manufactured and evaluated under different soil treatments with using the organic and biofertilizers to study the material stability and life expectancy.

Bi-OPL drip tubes appeared to possess a high resistance to all treatments. Tubes materials showed very little degradation indicated by minimal changes in tensile strength and weight. The maximum loss in tensile strength and weight did not exceed 2% for five months. On the other hand, the degradation rates for Ecovio tubes are greater after three months where weight loss was more than 3% than before (0.7 to 1%). Ecovio tubes retained good resistance for the first three months, but were less resistant on the 6th month (more than 57 % loss of its tensile strength) for all treatments. The previous results show that Bi-OPL drip tubes holds for more than five months and Ecovio drip tube hold for three months as their best working life expectancy. There are no significant differences between sterilized and non-sterilized soil in terms of degradation rates of Bi-OPL drip tubes, which means that the degradations are directly related to environmental factors such as UV-sunlight, moisture and temperature. Biodegradable drip tubes remain safe to the application of organic and bio-fertilizer.

**Key words**: Drip irrigation, biodegradability, biofertilizers, compost, soil.

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