

RECOVERY AND RECYCLING PATHS OF BIODEGRADABLE POLYMER PACKING

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A pilot-scale project in Kassel (Germany) with biodegradable polymer (BDP) packing was conducted from May 2001 until the end of 2002. BDP items (certified according to DIN V 54900) sold were: bags, trays, racks for fruits/vegetables, packaging (dairy, pastries, meat, diapers etc.), bin liners and foodware/catering articles. BDP packaging was recovered via the municipal organic collection and treated in a composting plant.

The composition of collected organic wastes (impurities, BDP content), MSW and packaging wastes was evaluated by 7 waste analysis campaigns in typical area structures of Kassel. An emphasis of the scientific investigations was the scrutiny of the treatment procedure of organic waste that included BDP in the composting plant. Monthly examinations according domestic standards were conducted to evaluate the compost quality. An agricultural application test was carried out to investigate the suitability of matured composts which were made from organic waste that contained BDP. Accompanying tests were carried out without fertilization, with a mineral fertilizer and with normal compost. Plant tolerability of the compost, crop yields and plant quality were evaluated. Examinations of chemical and physical consistency of the soil were carried out before and during the tests. Furthermore, the recovery of BDP used in the pilot-scale test via backyard composting was investigated during a one year investigation. Obtained results:

1) The amounts of impurities in the organic waste in the examined three city area structures did not change significantly compared with the analysis campaign before the test (Aug. 2000) up to the analysis campaign carried out in November 2002. Compared with the basic data a slight reduction of the percentage of impurities was recognized.

2) BDP packing did not affect the composting process technology. Main problem was the (manual) segregation of impurities, i.e. the elimination of conventional plastics, metals etc.. The efficiency of the impurity segregation decreased with increasing biopolymer contents. Higher BDP contents caused a clear reduction of the sorted out amount conventional impurities. Small BDP additions to strongly contaminated biowaste reduced considerably the percentage of separated impurities.

3) Chinese leaves, which were fertilized with matured compost made from organic waste containing BDP had usual fresh and marketable (total product) mass yields per hectare. The obtained yields corresponded to the yields obtained from fertilization with conventional matured compost as well as with mineral fertilizer. Vitamin and nitrate contents and the plant quality were identical in all fertilized versions. No modification of soil characteristics could be determined due to the use of compost made from BDP containing biowaste.

4) Home composting resulted in good degradation rates for some tested products (especially starch based ones) and several BDP were proved to be hardly compostable (poly lactic acid and fossil based BDP) in backyard composting systems.