

Executive Summary

Report on Impacts of Kraft Paper, Certified Compostable Plastic Bags, Biodegradable Plastic Bags and Plastic Bags on Green Bin Program Performance

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Residential collection of source separated organics (kitchen organics) is increasing rapidly across Canada. Implementation of residential source separated organics (SSO) programs requires many decisions: what materials to collect; how they should be stored in the home and collected at the curb, the processing approach used (composting or AD), policies which could increase participation and capture in residential SSO programs, and the most appropriate end markets for finished compost. One of the decisions is which type of kitchen catcher bag (paper, certified compostable plastic, biodegradable plastic or plastic) to allow for set out of SSO in curbside bins.

Bag to Earth, a manufacturer of kraft paper kitchen catcher, Green Bin and leaf and yard waste bags, commissioned Kelleher Environmental in association with Robins Environmental Design to examine the impacts of different bag choices (paper, certified compostable plastic, biodegradable plastic or plastic) on SSO program performance. A key research question was to identify the extent to which allowing different kitchen catcher bags in the SSO program impacts on the amount of SSO collected, processing operations and the quality and amount of finished compost produced.

Operating data were collected from SSO programs across Canada. The information collected included:

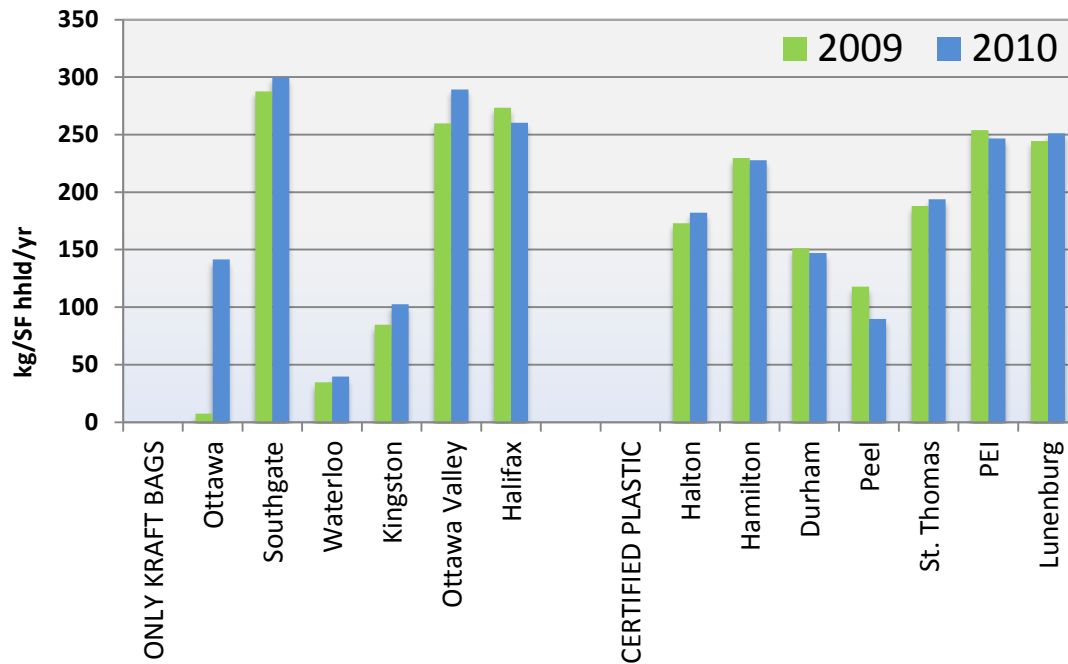
- Year the SSO program was implemented;
- Households served;
- Size of curbside bin (generally 46, 80, 120, 140 or 240 litres);
- Materials accepted in the SSO Green Bin program (kitchen organics or a broader list which includes pet waste and sanitary products; whether leaf and yard waste is collected in the Green Bin, etc.);
- Tonnes of SSO collected annually for each year since the program was initiated;
- Type of bags permitted in SSO bins (paper only, certified compostable plastic, biodegradable plastic or plastic);
- Frequency of garbage collection (weekly or bi-weekly);
- Policies which would impact on participation (bag limits, PAYT programs, etc);
- Location where SSO was processed and
- Residue rates at the processing operation.

The conclusion of the analysis was that many factors impact on the performance of the SSO program:

- **Age of the program (number of years in operation):** participation in SSO programs generally increases over time and the amount of SSO collected in Green Bin programs generally increases over time as long as a consistent promotion and education program is maintained and residents become used to the program requirements;
- **Frequency of garbage collection** - participation in SSO programs and capture of SSO are both generally higher in communities which only collect garbage every other week. Less frequent garbage collection service encourages residents to use the Green Bin more effectively;
- **Curbside policies** - participation and capture are higher in communities with lower garbage bag/container set out limits and where charges are in place for extra bags or containers of garbage.
- **Size of curbside Green Bin containers provided and the extent to which leaf and yard waste is included in the Green Bin:** Some communities choose small 46 litre Green Bin containers which have capacity for kitchen waste and other listed materials only whereas other communities chose a larger Green Bin container which has capacity for leaf and yard waste. The decision on the extent to which leaf and yard waste is permitted in the Green Bin is integrated with decisions on optimizing the collection system economics and also with processing operation capacity and technologies.

The research found that the choice of a particular type of bag (paper, certified compostable plastic, biodegradable plastic or plastic) did not significantly impact on participation or capture in the program - the other factors had more of an influence on participation and capture.

The figure below presents collection levels for programs which permit paper and certified compostable plastic bags, but not programs like Toronto and York which allow all types of plastic bags and collect a wider range of materials than most Green Bin programs. Capture levels among the programs profiled are low for Kingston and Waterloo as the programs are new - both were launched in 2009 and 2010.



The reasons for the decision on which kitchen catcher bag to allow vary by community. Some communities start out the SSO program allowing one type of bag, and move to a different set of rules over time depending on resident feedback and also on feedback from the composting or organics processing facility operator.

Composting facility operators contacted for the study expressed a preference for paper bags, as these compost readily in existing systems, and reportedly result in residue rates of “virtually zero”. All facility operators noted that certified compostable plastic bags compost more slowly than paper bags, and the processing operations experience higher residue rates from programs that use plastic bags, including biodegradable and certified compostable bags. Operators commented that a well-run composting operation should be able to achieve a residue rate of below 5%.

Municipal staff commented that there is a big difference between biodegradable plastic bags and plastic bags which are certified as compostable. The latter are acceptable in many programs, but the biodegradable plastic bags are not. Municipal staff commented that it is confusing for residents to know the difference between certified compostable plastic bags and biodegradable plastic bags, and that even with good intentions, when plastic of any type is permitted in the Green Bin, non-compostable plastic bags always appear in the composting pile, thus increasing residue rates at the processing operation.

Green Bin programs are being implemented across Canada. A number of years ago communities were faced with making decisions without significant information on what impacts

the design decisions might have on program performance. There is now significant operational experience to draw on to help program designers choose a system which suits the needs of their community. Well performing programs include a blend of policies and practices which best meet community needs and diversion targets, while integrating collection decisions with the broader integrated waste management system, and taking account of the implications of program design decisions on the organics processing operation.

For more information on the study, contact Maria Kelleher at maria@kellenv.com