



TORONTO'S GREEN ROOF POLICY AND ROOFTOP FOOD PRODUCTION

by Penny Kaill-Vinich

There are numerous examples of successful productive rooftop gardens such as the container garden shown here.

Summary

The creation of green roofs and rooftop gardens are becoming increasingly popular in Canadian cities. These practices reduce the city's environmental footprint, increase sustainability of urban areas and improve quality of life. At the same time, the many benefits of local food production, particularly increased food security, are becoming more apparent. All these factors intersect in the recently approved Toronto Green Roof Bylaw, which may provide opportunities to substantially increase rooftop food production initiatives. However, while the City lists "opportunities for local food production" alongside other benefits of green roofs,^{1,2} references to food production are noticeably absent in the specifics of the Bylaw.

This article highlights potential connections between green roof policy and rooftop food production, suggesting both can be encouraged. It distinguishes between green roofs and rooftop gardening, discussing the potential benefits of each and linkages between the two. It also reviews the new Toronto Green Roof Bylaw, some of its features that could be challenging to future rooftop food production, and proposes changes to more easily allow rooftop gardening to be integrated into the policy.

Résumé

La création de toits verts et de terrasses-jardins est de plus en plus populaire dans les villes canadiennes. Ces aménagements réduisent l'empreinte environnementale des villes, augmentent le caractère durable des zones urbaines et améliorent la qualité de vie des citoyens. En même temps, les nombreux avantages de la production alimentaire locale et surtout, l'amélioration de la sécurité alimentaire, deviennent plus apparents. Tous ces facteurs se recoupent dans le règlement sur les toits verts récemment adopté par la ville de Toronto, qui devrait permettre d'accroître considérablement les projets de production alimentaire sur les toits. Si « occasions de production alimentaire locale » figurent parmi les avantages potentiels des toits verts^{1,2}, toute allusion à la production alimentaire brille par son absence dans le libellé du règlement.

Cet article souligne les liens potentiels entre une politique de toits verts et la production alimentaire sur les toits, laissant entendre que les deux devraient être encouragés. On fait la distinction entre les toits verts et les terrasses-jardins, énumérant les avantages potentiels de chacun et les liens existant entre les deux. L'article examine également le nouveau règlement de Toronto sur les toits verts et certaines de ses particularités qui pourraient faire obstacle à une éventuelle production alimentaire sur les toits, et propose des changements visant à faciliter l'intégration des terrasses-jardins dans la politique.

Green Roofs vs Rooftop Gardens

The terms “rooftop gardening” and “green roofs” are often confused, with both used interchangeably to describe everything from flower planters on a roof terrace to an industrial building covered with vegetation. “Rooftop gardening” more accurately refers to an urban agriculture *practice* than a particular form or design, while “green roofs” are a construction technique and sometimes used as a specific *kind* of rooftop garden.

Green roofs are most commonly highly technical roofing systems comprised of layers for insulation, drainage and vegetation, installed over a conventional roof.³ Extensive green roofs are the most common type, generally low weight and lower cost, containing hardy, drought-resistant plants requiring little maintenance. They are usually not intended to be readily accessible to people. Intensive green roofs have a deeper growing medium, are heavier and more expensive, but allow for a wider variety of plants, including food crops and trees. Generally they are meant to be accessible and require more regular maintenance.

Green roofs have multiple environmental benefits, including stormwater runoff reductions of up to 50%-80%; significant energy savings for building heating and cooling; air filtration; urban heat island effect reductions; roofing structure life extension; and increased urban biodiversity.^{3,4,5} These benefits have a significant impact on a building’s energy consumption and ecological footprint. Intensive green roofs used for food crops also provide the additional environmental benefits that come from local food production, such as reduced fuel consumption for transport and storage.

Rooftop gardens are typically defined as any kind of growing taking place on a building’s rooftop. Most often they are not built into the roofing structure, but are an addition to the building after initial construction. As a form of urban agriculture for a food security or market production goal, the practice could more precisely be referred to as “rooftop food production”.

The methods by which rooftop gardening are practiced are broad, and vary depending on specific site characteristics. There are numerous examples of successful productive rooftop gardens ranging from modified container gardens, to raised beds built directly on the roof, to intensive green roofs created specifically for food production.⁶ Each form of rooftop food production has its benefits and is suited to some sites (and budgets) more than others. A significant increase in rooftop food production in any city would involve multiple growing methods and designs.

Rooftop gardening is only one example of urban agriculture, but has an important place within a comprehensive urban agriculture strategy, as it takes advantage of underutilized urban spaces. To significantly increase food production within a city, considerable space must be allotted to this activity; rooftops provide this without interfering with other land uses. Rooftop gardening can also help alleviate waiting lists for community or allotment plots; minimize issues of contaminated soil at ground level; reduce garden damage caused by pests and vandalism; create accessible growing spaces for those with reduced physical mobility or small children; resolve land tenure issues; and situate food production about as close to the plate as possible.

It is estimated that the current available space for green roofs in Toronto is approximately 5000 hectares, accounting for 8% of the city’s total land area.^{4 (p.49)} To conservatively assume that only 25% of this space is suitable for rooftop food production due to technical considerations, would still leave over 1000 hectares to make a substantial contribution to local food production initiatives. Further, this does not take into account new construction affected by the Green Roof Bylaw. These buildings will be constructed to support some amount of green roof coverage and, potentially, much of this future additional roof space could also support productive rooftop gardens.

Toronto Green Roof Bylaw

Toronto City Council approved the Green Roof Bylaw in May 2009. The details will be further refined in the coming months, before the law comes

into effect in early 2010.⁷ After January 31, 2010, all new development will be required to have a percentage of the building covered by a green roof. This will apply to construction with a gross floor area (GFA) of 2000 m² or more (and for residential buildings at least 20 m in height). Required coverage for smaller buildings begins at 20%, and increases to a maximum 60% as GFA increases to 20,000 m² and above. This applies to all residential, commercial and institutional buildings, while industrial construction is exempted until 2011, at which time these buildings will be required to have 10% green roof coverage.⁸

This policy will increase green roof coverage in Toronto and produce the anticipated environmental benefits; however, it may not generate the food production opportunities hoped for by urban agriculture advocates. There are two main issues: the City’s green roof standards may make it difficult to use these spaces for food production; and the green roof requirement, without allowing for some specific exemptions, may actually reduce future opportunities for rooftop food production.

The Bylaw’s current Construction Standard (which details the technical parameters for green roofs in Toronto) defines an acceptable green roof as having a minimum of “a root repellent system, a drainage system, a filtering layer, a growing membrane and plants, and shall be installed on a waterproof membrane of an applicable Roof.” Intensive green roofs of this type, deep enough for substantial food production, will likely be the most expensive way for developers to meet the new requirement, making it unlikely that many will voluntarily choose this route. Less expensive and less technical productive green roofs would not be permitted under this definition.

In addition, the specifications for plant selection and coverage are fairly precise, and may exclude some types of food crops and planting arrangements. Earlier drafts of the Construction Standard also proposed vegetation height of no more than 0.9 m,⁹ again restricting the range of growing practices that could be employed. The Standard is intended to ensure installation of safe and high-quality green roofs, but if food production is

also a goal, these technical details must be considered.

The major environmental goals of Toronto's green roof initiative are to reduce stormwater runoff, heat island effect, and energy consumption.⁷ To this end, the suggested depth for the growing medium is 100 mm, the minimum depth likely to provide a 60% reduction in runoff, which is the performance standard aimed for in the Bylaw.¹⁰ However, this objective could also be met by forms of rooftop gardening that do not meet the specific requirements set out by the City. It would be possible to cover the minimum required roof area with forms of food production other than an intensive green roof, such as containers, built beds or simplified green roof systems consisting of minimal layers. Coverage would be equivalent, but the growing medium would likely be much thicker. A large, productive, container garden 150 mm – 200 mm deep could potentially create the same runoff reduction as a technical green roof with shallower depth.

If requirements were focused on performance standards rather than system components, other rooftop garden designs may be possible. This option does not currently exist in the policy and would require a variance application or exemption from the required green roof coverage – despite potentially providing the same benefits, with the additional benefit of increased local food production. In addition, a cash-in-lieu payment of \$200/m² is required for granted exemptions.

A standard exemption process could be developed for roofs used in food

production. It could be included with the exemptions already allowed when calculating Available Roof Space and used to determine the required green roof coverage. “[A]reas designated for Renewable Energy devices” are excluded, as are Private Terraces and Outdoor Amenity Space in high-rise residential buildings. Rooftop gardens could be included in the Amenity Space calculation, or given a separate standard exemption when some performance standard is met.

If intensive green roofs are the only form of rooftop garden permitted, developers may need further incentive to choose this option, perhaps from a direct financial incentive or grant from the city, or from a campaign alerting them to various options that could compensate for additional costs. Roof space could be leased to ground floor restaurants of a mixed-use building for growing their kitchen produce, thereby reducing the cost of food supplies.¹¹ An aspiring urban farmer without access to a plot or rooftop at home might also be interested in this kind of arrangement.¹² A rooftop plot offered with other condo amenities could be an incentive to potential buyers, particularly as people are becoming more interested in urban agriculture opportunities.¹³

Conclusion

It may seem overly ambitious to expect any one piece of policy, such as the Toronto Green Roof Bylaw, to address too many concerns at the same time. However, the greater concern is in not recognizing and encouraging potential gains from increased rooftop food production. These initiatives should not

be hindered by inadvertently restrictive policies. There are opportunities for the city to reap the environmental benefits of green roofs and increase urban food production by using the same policy tools.

Future proliferation of green roofs in Toronto could be a great step for urban agriculture, if the new policy can be used in an effective and flexible manner. The definition of green roof could be expanded, or exemptions for alternative growing practices could be explicitly added. Considerable attention is going to be paid to Toronto's rooftops in the coming years and it would be sensible to use them in the most advantageous way possible. Some imagination and a flexible vision of what urban rooftops could look like in the future is what is required. ■

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