

Irrigation System for Extensive Green Roofs

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Introduction

Are irrigation systems necessary in Ontario for proper maintenance of green roofs in preventing plant death?

Year 1 Part 1 – Completed Fall 2009

- Taken place indoors under controlled growing conditions.
- Irrigation systems set up to establish plants, and evaluate the irrigation systems for water saturation and distribution.

Year 1 Part 2 – Ongoing

- Monitor the established plants on a roof like structure under summer conditions.
- Monitor the irrigation system for water distribution, discharge and maintenance.

Year 1 Part 3 – To be completed year of 2011

- Observe the modules as they over winter.
- Record survival rates of plant material.
- Test irrigation for maintenance issues.

Aim

- 1) To evaluate the efficacy of two irrigation systems provided by DRAMM. Saturation and distribution were analysed.
- 2) To examine the need for an irrigation system to promote proper plant maintenance in green roofs in Ontario.



Toronto By-law

Starting January 31, 2010, a bylaw in Toronto will require green roofs in all commercial, institutional and residential development with an area exceeding 2,000m².



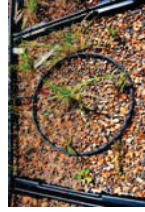
Method

- 3 demonstration green roofs were built
- The first roof had DRAMM Ring Irrigation Generation 2-ring
- The second roof had no irrigation system
- The third roof had DRAMM Line Prototype
- Both structures with irrigation were watered 3 or 2 times a day at 8 minutes each.
- All three structures were monitored for over-all plant health.
- Native plants and sedums were grown in the GreenGrid modules with or without DRAMM irrigation.



DRAMM Line Irrigation

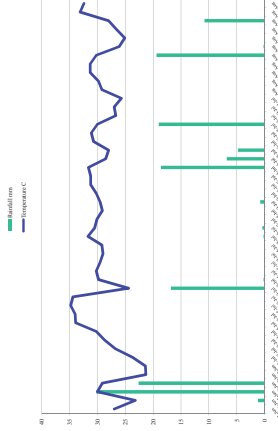
DRAMM Ring Irrigation 2nd Generation



Green roof Structures



Chart 1: Temperature and rainfall from January 22nd 2010 to August 1st 2010



Results (Pictures taken August 17th)

Line Irrigation

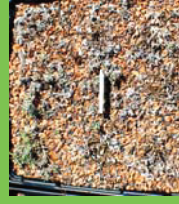


Structure

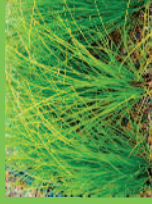
No Irrigation



Pussy Toes



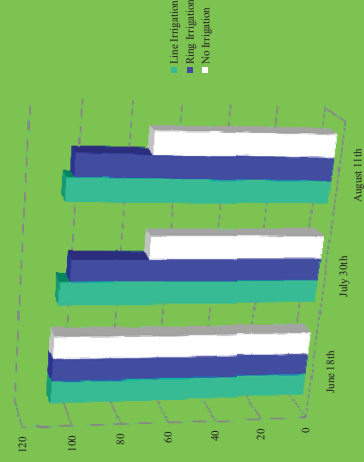
Pennsylvania Sage



Ring Irrigation



Chart 2: Plant Survival



Conclusion

Irrigation is needed in a Green Roof structure to maintain proper plant maintenance in Ontario.

Plant survival without irrigation was limited.

Line Irrigation and Ring Irrigation did not show significant difference in plant survival.

The Ring irrigation had trouble providing sufficient water to the corners and centre.