Table 1-1. Results of Weed Abundance Survey in Various positions around MacMillian

Beds	Quadrat #	Species	Abundance
#1 Loading dock Courtyard in raised bed	1	*Lactuca pulchella*	5
	2	*Lactuca pulchella*	1
	3		0
	4		0
	5	*Lactuca pulchella*	1
	6	*Lactuca pulchella*	2
	7		0
	8		0
#2 Behind Barn	1		0
	2		0
	3		0
	4		0
	5		0
#3 Macmillan North East bed	1		0
	2		0
	3		0
	4		0
	5		0
	6		0
	7		0
	8		0
	9		0
	10		0
	11		0
	12		0
	13		0
#4 Bed by South East Corner of building	1		0
	2	*Circium arvense*	1
	3	*Betula pendula*	1
	4		0
	5		0
	6		0
	7	*Lactuca pulchella*	1
	8		0
	9		0
	10	*Poa annua*	1
	11		0
	12		0
	13		0
#5 South bed	1		0
	2		0
	3		0
	4		0
#6 East bed	1		0
	2		0
	3		0
	4		0

#7 Bamboo Bed	1		0
	2		0
	3	*Lactuca pulchella*	1
	4		0
	5	*Weed shoots* **1**	10
	6	*Hypochaeris radicata*	1
	7		0
	8	*Weed shoots*	2
	9		0
	10		0
	11		0
	12		0
	13	*Lactuca pulchella*	1
	14		0
	15		0
	16		0
	17		0
	18	*Weed shoot*	5
	19	*Weed shoot*	6
	20		0
	21		0

1-Weed shoot: Weed seedling too small to identify.

Weed Density Around MacMillian Building

Weed Benchmarking

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Objective:

To quantify weed densities in flower beds around the MacMillian building on the UBC Campus.

To contribute time and knowledge of weed density to the UBC Seeds Project in order to contribute to the overall sustainability of the campus.

Abstract:

Weed control is necessary in both the agricultural landscape and the urban landscape. Conventional control has seen the use of agro-chemicals to help control weed populations. Often these controls are expensive and very toxic. The sprayed area is also not considered a pleasant place work, thus having social costs. In Agroecology at UBC, non-chemical weed control is stressed for a more sustainable system. If UBC is to be a leader in sustainability issues, agro-chemical use must be reduced right here, as a model for other areas. This report examines weed densities around the MacMillian precinct in the surrounding planting beds using scientific methods. It is the hope of the authors that this knowledge will lead to reduce chemical inputs on the land, both at UBC and further fields.

Key words: weed, agro-chemicals, sustainable, density, MacMillian precinct.

Introduction:

Weed control on the UBC campus is the responsibility of Plant Operations. The main method of weed control is a chemical spray program including 'Round Up' application. Often it is irresponsible to use such potentially harmful, toxic agro-chemicals in close proximity to students and wildlife. If weed densities are low enough, a non-chemical approach may be taken to prevent weed troubles. This non-chemical approach will reduce monies needed for the chemical herbicides, training for spraying, spray equipment, and safety equipment. Other benefits include a less toxic work area for gardeners, increasing the overall well being of the campus community. Sustainability is the focus of the Agriculture department at UBC. If UBC is to be a model for other communities, sustainable practices must be executed on the campus. This allows other people to follow the leadership of UBC. This paper aims to look at weed densities and abundance around the MacMillian building in order to better assess alternative methods of weed control on campus. A scientific survey was carried out measuring weed density within a measured quadrant placed randomly within planting beds. The areas tested are visual by means of a map provided. The total weed density of these planting beds will be submitted to the UBC Seeds Project as component of the larger project titled "*Landscape Pesticide Usage-weed benchmarking*".

Materials and Methods:

Planting beds to be surveyed for weeds around the MacMillian building were given to the group by the Seeds Project coordinator. The beds

are in close proximity to the building as to get an overall representation of weed density around the grounds. A wooden quadrant was constructed measuring 25cm by 25cm. This quadrant was placed in the designated planting bed at a random interval, to represent the overall weed density of the entire bed. This procedure was repeated throughout the beds, with number of samples taken depending on planting bed size. The weeds found per quadrant were totaled and samples were taken for the proper identification. Each bed was surveyed separately and results were totaled.

Results:

The results of the weed survey can be seen in the tables 1-1. Seven beds were sampled with name and number of species present listed. #1, The Loading Dock Courtyard in raised bed had 8 samples taken and 9 specimens of *Lactuca pulchella* present. The following beds had no weeds present: #2 Behind Barn, #5 South Bed, #6 East Bed, and #3 MacMillian Northeast Bed. # 4 The Southeast bed at the corner of MacMillian had 13 samples taken. 1 *Circium arvense*, 1 *Betula pendula*, 1 *Lactuca pulchella* and 1 *Poa annua* were found. #7 The Bamboo Bed had 21 samples taken and 2 *Lactuca pulchella* were present. 23 weed shoots were found here alongside 1 *Hypochaeris radicata*.

Map 1-1 shows the specific planting beds surveyed for weed abundance. The beds are numbered on the map one through seven. These numbers correspond to the numbers listed in Table 1-1.

Discussion:

The data collected shows a relatively low amount of weed density in the planting beds tested. The Bamboo Bed had the highest abundance of weeds, with 26 samples representing 3 species as listed in the results section. The SouthEast Corner bed had the most diversity of weeds present with 5 species. 16 weeds were present in total. The courtyard bed had the least amount of weeds present with 9 individual specimens of *Lactuca pulchella*.

The amount of weed present is very low in each bed. At these densities, manual removal of weeds would be a suitable method of control, a sustainable alternative to chemical control.

It should be noted that chemical application of herbicide has been carried out throughout the earlier months of 2001. This application would reduce the amount of weeds present. This case shows the overall effectiveness of chemical control, but points to the inefficiency of the herbicide application. If weed densities are this low, there is no need for chemical control, a manual weeding regime could easily control the weed situation.

Conclusion:

The weed abundance found around the Macmillian Building is very low. In total, 38 weeds were present from 7 species. We assume that herbicides have been applied to all beds. This would account for the low abundance of weeds in the beds surrounding the Macmillan precinct. It our recommendation to continue to monitor these beds in the future to determine how the abundance of weeds changes over time without the application of herbicides. Perhaps aesthetic thresholds can be established to determine

appropriate abundance's that if exceeded, would require control of some kind. Furthermore planting more perennials in bare patches in the beds could increase competition for light and nutrients. This strategy could be employed to outcompete weed species. Finally using collected leaves from the fall can be spread in the spring to suppress weed shoot development. An organic mulch of leaves has the added benefit of slowly releasing organic matter and nutrients into the beds for use by plants. In summary it was found that weeds are not abundant in the beds surrounding the Macmillan precinct and that further monitoring is recommended. Finally alternative strategies for weed control were suggested including organic mulches and higher density planting of perennials.

Map 1-1 Map of Physical Land Surveyed for Weed Abundance