



# FERTILITY AND WEED MANAGEMENT IN ORGANIC HIGHBUSH BLUEBERRY PRODUCTION

Interim Research Report E2006-06

## INTRODUCTION

For organic production, common weed-control strategies that rely on herbicides are not applicable. Instead, other approaches have to be tested. Mulches are used in other horticultural crops, like apple orchards, to suppress weeds and provide plant nutrients. They can be effective in preventing emergence of weeds, but can themselves be a source of weed seeds. Also, it can be difficult to predict nutrient release from composts because of their varying composition and carbon: nitrogen (C:N) ratios.

Highbush blueberries thrive in areas that are well-drained and have a high level of organic matter, making them an ideal crop for compost and mulch use. The objective of this research is to test mulch application as a weed control practice for organic highbush blueberries. Results from the first study year (2005) are discussed below.



Manure-sawdust (L) and seafood waste (R) compost treatments (N. Burkhard)

## WHAT WAS DONE?

On a commercial farm called 'Blueberry Acres', located in the Annapolis Valley of Nova Scotia, different mulches and fertility treatments were used in an existing field of 4-year old 'Duke' blueberry plants. The site had sandy loam soil and the bushes were originally planted with approximately 175 m<sup>3</sup> ha<sup>-1</sup> of manure / sawdust compost mixture.

This project was designed to include three different types of mulch, two fertility amendments, and a control where nothing was applied. The treatments are outlined in Table 1. Each treatment was divided into weeded and nonweeded subplots.

**Table 1. Treatment descriptions for highbush blueberry fertility – weed management trials**

| Trt | Description                   | Application Rate         |
|-----|-------------------------------|--------------------------|
| 1   | Control                       | -                        |
| 2   | Ammonium sulphate fertilizer  | 60 kg N ha <sup>-1</sup> |
| 3   | Dehydrated poultry manure     | 30 kg N ha <sup>-1</sup> |
| 4   | Pine needles                  | 80 t ha <sup>-1</sup>    |
| 5   | Horse manure/ sawdust compost | 550 t ha <sup>-1</sup>   |
| 6   | Seafood waste compost         | 360 t ha <sup>-1</sup>   |

Various measurements were taken throughout the growing season to assess the benefits of mulch application for weed control and nitrogen fertility. These included soil samples, compost nutrient analysis, weed ground cover and biomass surveys, leaf nutrient analysis, yield analysis (berry weight and number), plant canopy measurements, and PRS<sup>tm</sup> (Plant Root Simulator) probes to monitor spring nitrogen mineralization.



Blueberry plant with compost treatment (N. Burkhard)

## PRELIMINARY RESULTS

The following graphs present preliminary results from the first field season. Figure 1 shows the average amount of weed biomass per quadrat found in each subplot. Three 0.25 m<sup>2</sup> quadrats were clipped in each nonweeded subplot (late August) and the weeds were dried and weighed. The amount of weeds in the seafood waste compost (Trt 6) was the highest of all treatments. The manure-sawdust compost (Trt 4) and the seafood waste compost (Trt 5) had the least amount of weeds and the best weed control.

Blueberry yield was comparable in all weeded subplots, but surprisingly high in *unweeded* control and seafood compost treatments (Fig. 2).

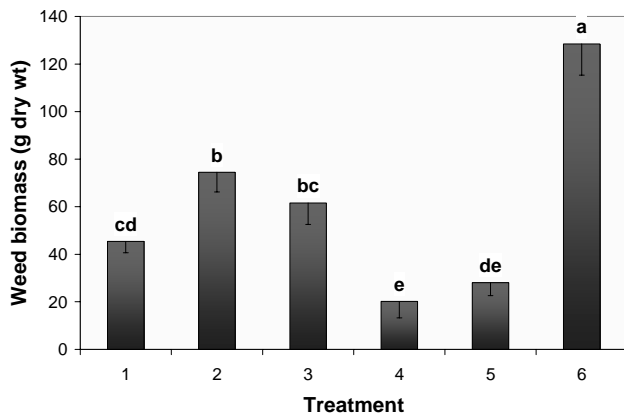


Figure 1. Weed biomass as affected by mulch and fertility treatments (with standard error bars). Different letter grouping indicates significance at the 5% level according to Fisher's LSD

## CREDITS

Nicole Burkhard (Graduate student), Derek Lynch, David Percival and Roxanne Beavers (ed.)

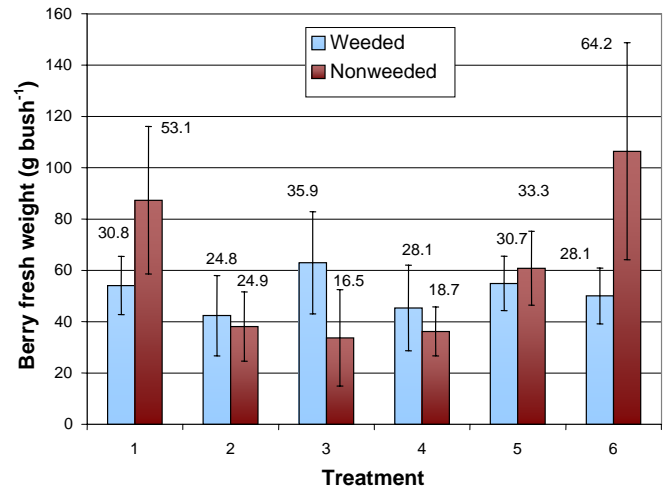


Figure 2. Mean fruit yield as affected by fertility treatment and weed management (with standard error bars and mean number of berries bush<sup>-1</sup>)

## THE BOTTOM LINE...

Sawdust/manure compost and pine needle mulch provided the best weed control. The plots that received seafood waste compost had substantial midseason weed competition, but yield remained high.

Further analysis will be performed on crop yield and quality, weed competition, and soil fertility.

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