Non-chemical weed control with mulches and disks for nursery container production

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Experimental set-up
From 2003 to 2005, trials were conducted at four locations across Canada to test alternative weed control options for efficacy on weed control and impact on plant fertilisation. This poster is a summary of results from trials at Byland’s Nurseries, Kelowna, B.C. Funding came from the Canadian Nursery Landscape Association.

Results on weed control
Six commercially-available products, no weeding and herbicide Ronstar (oxadiazon), were compared to monthly hand-weeding. Number of weeds removed over one year was significantly lower \((p=0.01)\) with woven coco-fiber disk, moulded plastic lid, crumb rubber, Biotop (starch-based product), sawdust, and herbicide Ronstar, with 95 to 98% weed reduction for the top 3 treatments.

Commercial use of non-chemical weed control mulches
Mulches and disks offer effective control of specific troublesome weeds. Liverwort, a moss-like plant, is common in container production where it is supplied with regular irrigation and fertilisation. It is a major nursery weed across North America as currently-registered herbicides offer poor control.

Results on fertiliser placement
After one growing season, top growth was significantly higher where fertiliser prills were placed \(\text{under the mulch or disk}\). Results were not different between control (no mulch, fertiliser on surface) and treatments with the prills placed over the mulch. Media analysis indicated significantly higher soluble salts for treatments where prills were placed \(\text{under the mulch or disk}\).

Commercial use of weed control disks
Mulches and disks are cost-effective for production of high-value plants inside greenhouses and covered buildings. Most herbicides are not registered for closed structures, as the vapor fumes can result in serious phytotoxicity damage to the crop. Mulches applied on top of growing media create a fast-drying surface that prevents growth of water-loving weeds.

Commercial use of weed control mulches
Mulches and disks offer season-long weed control residual. In regions receiving extensive rainfall, such as the B.C. Coast, weed growth is rapid, especially at the base of slow-growing plants such as 

Cost of mulches and disks
- For a standard 1-gallon container, per year:
  - Sawdust mulch is $0.01 (for 240 ml / pot);
  - Biotop mulch is $0.04 (for 90 ml / pot);
  - Crumb rubber mulch is $0.08 (240 ml / pot);
  - Plastic lid disk is $0.09 (1 disk per pot);
  - Coco-fiber disk is $0.14 (1 disk per pot);
  - Ronstar herbicide is $0.03 (3 applications);
- Hand-weeding is $0.10 to $0.25 (2 passes).

References: