

# Berries

**Tuesday morning 9:00 am**

**Where:** Grand Gallery (main level) Room E & F

**MI Recertification credits:** 2 (1C, COMM CORE, PRIV CORE)

**CCA Credits:** PM(1.5) CM(0.5)

**Moderator:** Eric Hanson, Horticulture Dept., MSU

- 9:00 am      Update on Spotted Wing Drosophila Management in Raspberries
- Rufus Isaacs, Entomology Dept., MSU
- 9:30 am      Strategies for Successful Blackberry Production in Cold Regions
- Fumi Takeda, USDA-ARS, Kearneysville WV
- 10:00 am     Strawberry Weed Management Update
- Eric Hanson, Horticulture Dept., MSU
  - Bernard Zandstra, Horticulture Dept., MSU
- 10:20 am     Disease Management Strategies for Brambles and Strawberries; What's New?
- Annemiek Schilder, Plant, Soil and Microbial Sciences Dept., MSU
- 10:50 am     Session Ends

# Challenges and Opportunities for Growing Blackberries in Areas with Adverse Environmental Conditions

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The rotating cross-arm (RCA) technology (Fig. 1) combines a unique trellis design and cane training protocol. Developed over the last two decades, this technology is beginning to have an impact on the blackberry (Genus *Rubus*, subgenus *Rubus*) industry in the United States (USA). It has been successfully transferred to growers in more than 25 states in the last 4 years and contributed to increasing the fresh market blackberry acreage by about ~150 ha in the Midwest and eastern USA. Our R&D effort on the RCA technology and recent commercialization of this growing system by Trellis Growing Systems (Ft. Wayne, IN USA) has shown that 1) winter injury can be reduced by modifying the crop environment and production techniques, 2) white drupe formation can be reduced when fruit is positioned away from direct sunlight, and 3) harvest efficiency is improved when the fruit positioned on one side of the row. Our research has also shown that RCA technology can be used to generate several times more one-node floricanes cuttings (Takeda et al., 2011) and long-cane plants than traditional propagation methods (Patent No. 8,327,578, see Fig. 2). The enclosure technique for producing one-node cuttings improved rooting of some cultivars as miniature blackberry plants ready to fruit, but there were recalcitrant cultivars like ‘Apache’. Consistent production of blackberries was achieved in areas with minimum winter temperatures below  $-22^{\circ}\text{C}$  with the RCA technology. This technology allows the canes to be positioned close to the ground in winter and covered with a floating rowcover (Fig. 3). An unexpected result of this winter protection system was some leaves on the floricanes remained green throughout the winter and spring and were photosynthetically functional when growth resumed under warmer conditions of greenhouse.

More recently, the RCA technology has been evaluated for growing red raspberries under Nordic conditions (R. Nestby, pers. comm.). In Norway the floricanes of red raspberries often suffer 20-30% injury from exposures to low temperatures. In a cooperative project, Bioforsk and USDA implemented methods to improve winter survival of red raspberry (Fig. 3). We studied from 2011 to 2014 the bending and covering effect of red raspberry floricanes of ‘Glen Ample’, ‘Stiora’ and selection KV91-39-7 on winter injury and yield. Canes were trained to a rotating cross-arm (RCA) trellis system and covered with two layers of polyethylene sheets, and supplemental heat was provided at critical temperatures. Bending plus heating reduced freezing injury of buds for all cultivars, and tended to increase yield for ‘Stiora’ and KV91-39-7, but not for ‘Glen Ample’. Plots lifted directly to vertical after winter covering yielded more than plots where canes were left horizontal till anthesis and then lifted to vertical. The experiments show that bending raspberry canes to avoid freezing injury, was possible without much visible cane injury if bending was undertaken carefully using a RCA trellis.

Fig. 1. The rotating cross-arm (RCA) trellis (see below left). The commercial version is constructed of fiberglass reinforced plastic components. The trellis consists of a post (~50 cm) (a).

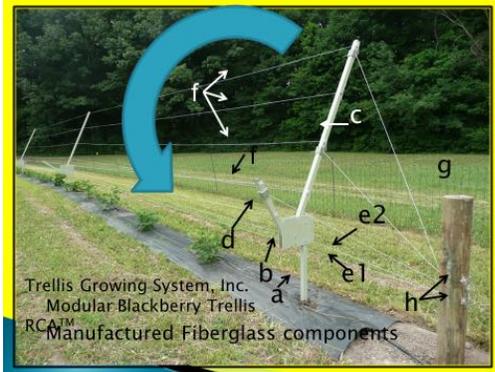


Fig. 2. A method (above right) of producing canes plants from lateral canes trained on the rotating cross-arm trellis system.



Fig. 3. Winter injury common in areas with winter temperatures below  $-20^{\circ}\text{C}$  (A). The RCA trellis and cane training system is used to lower plant canopy close to the ground in winter (B). Covered plot (C).

A.



B.



C.

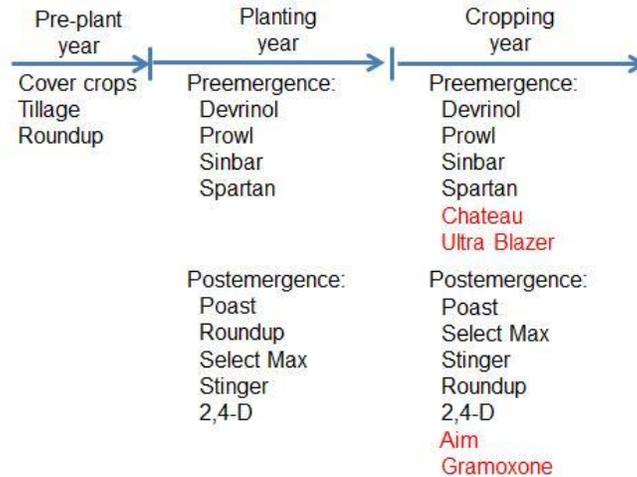


# Weed Management Options for Strawberries

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Managing weeds in strawberries has always been a challenge. This is partly because strawberries are herbaceous perennials and a number of similar weeds tend to become established in fields as they get older. Available herbicide tools are also somewhat limited because perennial strawberries grown in the eastern and Midwestern states are such a minor crop and the potential for injury to strawberries is relatively high. Effective management requires knowledge of the herbicides options and weed identification. Herbicide options available for Michigan strawberries are summarized in MSU Bulletin E-154, Michigan Fruit Management Guide. An excellent book on weed identification is 'Weeds of the Northeast' (Cornell University Press, 1997). Here are some suggested practices:

## Strawberry Weed Management Options by Year



### PRE-PLANT YEAR

If perennial weeds such as quackgrass, Canada thistle, red sorrel, or yellow weed sorrel are present, treat the site with glyphosate (Roundup, Touchdown) in the fall prior to planting. Treat weeds when they are still green and do not till for 1-2 weeks. The site can also be treated in the spring 1-2 weeks before planting, but spring sprays are less effective on established perennials.

### PLANTING YEAR

Key periods for weed control in new fields are 1) planting time 2) late summer/early fall, and 3) prior to mulching in late fall. A large flush of weeds usually germinate shortly after planting. Sinbar or Devrinol can be applied shortly after planting to control these weeds. Use Devrinol 50DF-XT at 4-8 lb/acre (lower rate on sandier soils). Devrinol can inhibit rooting of runner plants on very sandy soils. Use Sinbar 80WDG only if the soil contains more the 0.5% organic matter. Apply 2 oz/acre on sandy soils with 1-2% organic matter or 3 oz on heavier soils with more organic matter. Make sure your sprayer is calibrated

and avoid spray overlap; berries are sensitive to Sinbar. Be cautious with varieties such as Annapolis, Cavendish, Earliglow, Honeoye, Kent, Tribute, and Tristar. Sinbar can be re-applied in the late summer or late fall as long as the seasonal total does not exceed 6 oz on the low organic soils or 8 oz on high organic soils. If Sinbar is applied when new strawberry leaves are present, irrigate soon after spraying.

Prowl H2O can also be used on new fields for preemergence control of grasses and broadleaf weeds. Prowl will burn new strawberry tissue so it should only be applied directly over plants before or shortly after planting (before growth begins).

Spartan 4F is labeled for Michigan strawberries (check label for other states) at planting time. Like Prowl, Spartan will burn new growth so apply before strawberries begin growing. Spartan controls several troublesome weeds, including common groundsel, field pansy, mayweed or dog fennel, pineapple-weed or chamomile, several pigweeds, and white campion, and may suppress yellow woodsorrel and yellow nutsedge.

Useful postemergent herbicides approved for strawberries in the planting year include Stinger (Michigan label; check your state), and the grass killers Poast and Select Max. Stinger controls many weeds in the composite and legume families (Canada thistle, dandelion, common groundsel, marehail, mayweed, clover, vetch) as well as black nightshade and smartweeds. Stinger can be used in July after new plants are well established. Use Poast or Select Max when grasses are 4-6 inches tall and actively growing. Use a crop oil concentrate to improve control. Quackgrass control may require repeat applications.

Sinbar 80W, Devrinol 50DF, or Spartan 4F can be very effective when applied just before mulching in late November or December. Sinbar or Spartan applied prior to mulching can provide effective control of many weeds through the spring. Remember not to exceed the maximum yearly rates. Devrinol at this time is very effective in controlling volunteer grain and other grasses in the spring.

### FRUITING YEARS.

In the early spring of a fruiting year, Devrinol can be applied to control early season grasses and some broadleaf annuals. If grass is still a problem, consider treating emerged grasses with either Poast or Select Max. Stinger 3L can also be applied at this time (up to 30 days before harvest) if susceptible weeds are present. Do not apply Stinger more than twice per year or exceed 2/3 pint per season. Stinger can cause leaves to cup or twist, and may cause fruit to ripen over a shortened period of time.

Renovation after harvest is an important time from a weed management perspective because strawberries are in a semi-dormant state and more tolerant of herbicides at this time. This is an effective time to use 2,4-D amine to control most broadleaf weeds. Spray weeds and wait several days before mowing plants. Never use ester formulations of 2,4-D as injury will result. Stinger can also be applied at this time, but it may not control as many types of broadleaf weeds as 2,4-D. Renovation is also a useful time to re-apply preemergent herbicides to suppress new weeds for the rest of the summer. Try Sinbar, Spartan, Prowl or Ultra Blazer. Follow label cautions and restrictions carefully. These materials can be re-applied in the late summer/early fall as long as the seasonal maximum rates are not exceeded. This brings us to late fall (pre-mulching), another key time for weed management. The herbicide options described for late fall of new beds apply for established beds as well.