

**Special Points
of Interest**

- There is essentially no other time ... to get your greenhouse clean and "start from scratch" than summer.
- A summary of how to grow a fall mum crop outdoors.
- Flower induction of many plant species is synchronized during the year by using changes in day or night length
- Minnesota's Lawn Phosphorus Fertilizer Law

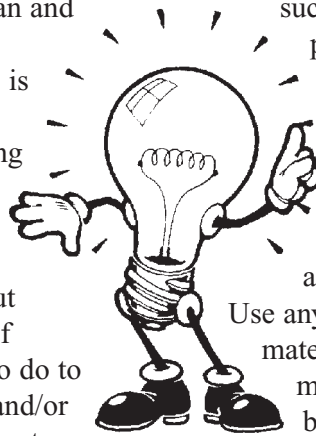
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Things to Remember to Do in your Greenhouse This Summer

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Summer is a critical time to get your greenhouse clean and 'start from scratch'. There is essentially no other time during the year when this is possible! For this reason, I put together a list of helpful things to do to minimize pest and/or disease issues next fall and spring as well as a few things that are difficult to do once plants are in the greenhouse.



- 1) Remove and/or discard all plants. Last year's plants are a primary source of virus even if they are not showing symptoms!
- 2) Sweep the entire facility – fungal spores are often spread by airborne dust when greenhouses are swept.
- 3) Remove any other media/soil residue such as around piping corridors down main concrete pathways.
- 4) Sterilize all surfaces. Use any of the materials mentioned below:
 - a. Bleach 5-10% solution
 - b. Zerotel
 - c. Hydrogen peroxide – very short life, i.e. must use right away.
- 5) Kill all plant material around the greenhouse which often harbor insect pests that will reenter a greenhouse and, sometimes, reintroduce viruses. ONLY use 'non-2,4-D based herbicides anywhere near a greenhouse!
- 6) Establish a quarantine area. It is becoming increasingly important to have an isolated area to initially bring in plant material or cuttings. You can eliminate any pests here before you introduce them into your entire facility and spend a lot more money trying to clean the problem up!
- 7) Kill all adult insects – pesticide 'bombs' are preferable. Drench soil under benches or wait 5-7 days and reapply a pesticide to kill adults.
- 8) Wash all light bulbs and reflectors – dust can often decrease light emission by 10-15%. Similarly, power-wash the inside of the greenhouse to reduce dust on your glazing.
- 9) For those growers with subirrigation systems, install

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sterilizing pads at the entrances to each greenhouse to minimize spread of foot-borne diseases from greenhouse to greenhouse.

- 10) Clean your headhouse – diseases are often spread on hands and feet from a headhouse facility.

- 11) Eliminate soil under benches if possible. The best way is to simply pour concrete. Fungus gnats, shore flies, and thrips are all big problems in greenhouse production. Soil under benches greatly increases the amount of money you will spend buying and applying pesticides as

this is where these pests can survive and proliferate.

- 12) Purchase needed pesticides and fertilizers now when you know that you can get them!

Consumer preference in garden chrysanthemum colors has changed. During the 1960-1970's gold and bronze colors were quite popular. Currently, garden mums sales can be broken down into the following color groups: yellow (26%), pink/lavender (22%), white (14%), bronze (14%), red (14%), coral/salmon (6%), and orange (4%).

Garden Mum Production

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Introduction:

Garden chrysanthemum production has changed dramatically with the introduction of many new types of chrysanthemums. Most notably, the 'Belgian' types of chrysanthemums have increased in popularity and are now prevalent throughout the industry. New problems have occurred. Most commonly, chrysanthemums are not reaching the size growers would like and/or cuttings or plants have buds too early. This review will summarize how to grow a fall mum crop outdoors and avoid these problems. In addition, most problems with a garden mum crop are a result of 'non-optimal' conditions during the first month. Therefore, I will spend

more time reviewing what should be done during that month to insure a successful crop.

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Emphasis on hardiness is coming back! Over the last 10 years, what cultivars have been grown have been based mostly on crop size and flower form or color with little regard to hardiness. Consumers have finally realized this and are

Table 1. List of the hardiest chrysanthemums for Minnesota and the year they were introduced.

Cultivar	Year
Sesquicentennial Sun	2001
Peach Centerpiece	2001
Betty Lou Maxi-Mum	1996
Inca	1996
Snowscape	1996
Rose Blush	1993
Maroon Pride	1989
Mingopher	1977
Burnt Copper	1988
Grape Glow	1988
Lemonsota	1988
Rosy Glow	1987
Centennial Sun	1985
Gold Country	1983
Mellow Moon	1983
Centerpiece	1982
Minnqueen	1979
Royal Knight	1979
Autumn Fire	1977
Golden Star	1977
Minnruby	1974
Minnyellow	1972
Minnwhite	1968
Zonta	1964
Minnautumn	1962
Wayzata	1961
Minnpink	1957