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IRRIGATION DIVISION

EXPOSED LOCATIONS REQUIRE HARDIER VARIETIES

By Gary A. Anderson, Chairman, Horticultural Industries Technologies Div., Agricultural Technical Institute, Ohio State University, Wooster, OH

The groundskeeper who desires to brighten the landscape with flowering plants often finds areas exposed to full sun and drying winds a special challenge. Newly constructed residential and public building sites are often without protection and shade. Bright sun and windy conditions work together to lower humidity around the plants and increase water loss from them. Windy conditions cause mechanical damage to delicate flower petals and foliage. However, selection and conditioning of annual and perennial plants can provide color for even these apparently harsh locations.

Planting in exposed locations

Select dwarf varieties which generally withstand windy conditions better than taller varieties of the same species.

Set out larger, more developed plants that have been grown in large cell packs or singly. Smaller plants may dry out before they become established.

Avoid setting out spindling plants that will be slow to establish and which may suffer from mechanical damage due to wind.

Condition plants to outside environment before planting. Withhold water to firm plant tissue and prepare for water stress conditions.

A number of annual and perennial plants will perform well in windy and dry conditions. One of the most tolerant plants for bedding work is *Vinca* or Periwinkle. The glossy green foliage grows eight to 16 in. tall and fills in rapidly. Five-petaled pink, white, or rose blossoms are produced throughout the summer and fall, even when temperatures become very hot.

Wax begonias are colorful, compact plants that withstand windy conditions well. Bright sun may cause some damage to the foliage but this is often covered with a profusion of red, white or pink

blossoms and is therefore not conspicuous. There is very little maintenance with the plant and few insects and diseases attack it.

*Gazania*s grow well in hot, windy places. The brightly colored daisy-like flowers have distinctive dark around the center. Flowers rise six to 12 inches above the ground. Blossoms close in cloudy weather and at night.

Perennials

Perennials bloom over a shorter period of time than annuals, but once established, will persist for many years. *Asclepias* or butterfly weed is a showy, brilliant orange perennial that will tolerate dry windy locations and poor, dry soil. It has almost no insect or disease problems and once established requires little attention. The plant is two to three feet tall and blooms for about two weeks in mid-summer. Another plant that sports a bright orange cluster of flowers two to three feet above the ground is Maltese Cross (*Lychnis*). Strong stems support flowers even during driving rains.

Achillea or yarrow will withstand drought in open, sunny locations. The flat golden heads are produced in midsummer, even if the plants are neglected. Wind passes through the fern-like foliage with little effect on the plant.

Other annuals and perennials listed in the chart have characteristics that make them good candidates for exposed planting. Nursery or seed catalogs and gardening books should be used to check out heights, blooming times and colors. When purchasing plants or seeds, pay attention to the attributes of the particular cultivar to make sure it is what you think you are getting. The introduction of many dwarf cultivars on the market has increased the choice of flowering plants for exposed locations.

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Plants Suitable for Exposed Locations

Annuals

Arctotis (African Daisy)
Begonia (Wax Begonia)
Catharanthus (Vinca or Periwinkle)
Celosia
Coreopsis (Calliopsis)
Dimorphotheca (Cape Marigold)
Eschscholzia (California Poppy)
Gaillardia
Gazania
Gomphrena (Globe Amaranth)
Helichrysum (Strawflower)
Mesembryanthemum (Livingston Daisy)
Pelargonium (Geranium)
Portulacca (Moss Rose)
Sanvitalia (Creeping Zinnia)
Tagetes (French Marigold)
Verbena

Perennials

Achillea (Yarrow)
Armeria (Sea-Pink)
Artemisia
Asclepias (Butterfly Weed)
Aster (Michaelmas Daisy)
Coreopsis
Echinops (Globe Thistle)
Gaillardia
Hemerocallis (Day Lily)
Kniphofia (Red-Hot-Poker)
Liatris (Gayfeather)
Lychnis (Maltese Cross)
Monarda (Beebalm)
Physostegia (False Dragonhead)
Rudbeckia
Sedum
Veronica

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Dave Portz
Grounds Superintendent
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WEED AND GRASS CONTROL IS A PREPLANT CONSIDERATION

By Thomas A. Fretz, Professor and Head, Department of Horticulture, Kansas State University, Manhattan, KS

The control of annual grass and broadleaf weeds in and around annual bedding plant displays is a serious problem for those involved in landscape maintenance. The solution to this problem is most often accomplished by the laborious and costly process of manual weeding, however it should be remembered that several herbicides are available and labelled for use on annual bedding plants.

Prior to selecting one of the herbicides labelled for use on annuals, it is important to review a few of the principles of weed control. Initially, it must be remembered that in order to achieve success with a weed control program on annuals, it will be necessary to have a good idea of the weed species which are going to be present. While this is not always possible, it will be a great help in finally selecting the proper herbicide to do the job. In general, the herbicides which are labelled for use on annuals will control annual grass and annual broadleaf weeds.

Secondly, the herbicides which are labelled for use on bedding plants are pre-emergent herbicides, thus they need to be applied prior to weed seed germination in order to be effective.

Thirdly, herbicides to be used on annual bedding plants can be applied at 2 times, prior to planting of the annuals (pre-plant) or prior to the emergence of the weeds but after transplanting of the annuals (pre-emergent). Except for an occasional spot treatment, the post emergent herbicides would rarely be used around annual bedding plants. In our research, we have generally applied the herbicides pre-emergent to weed seed germination, that is following transplanting and establishment of the annual flowers.

Also, it will generally be easier to use a granular formulation of the herbicide than either a wettable powder or emulsifiable concentrate. Our research observations have indicated that in general, less phytotoxicity occurs with granular when compared to the other formulations, however weed control is not always as satisfactory with the granules.

Well, what about specific herbicides for use on annual bedding plants? Of all of the materials labelled for this use, DCPA (Dacthal) which is available in either a 75% wettable powder or a 5% granular formulation has the broadest spectrum in terms of plant safety. Dacthal is labelled for use on alyssum, petunia, chrysanthemum, coleus, dahlia, geranium, salvia, snapdragon, and zinnia to name a few. Applied after transplanting on clean, weed-free soil at a rate of 8-10 pounds of active ingredient per acre, Dacthal will control annual grass and broadleaf weeds including large crabgrass, annual bluegrass, speedwell, witchgrass, carpetweed, common chickweed, lambsquarter, purslane and others. Irrigation immediately after application with 1/2 inch of water will enhance and improve the weed control. Dacthal will cause injury to carnation, pansy, phlox, and sweet william and for this reason should not be used on these crops. A single application should control weed growth for ap-

proximately 6 weeks, after which there should be sufficient coverage of the area by the annuals to prevent or severely restrict further weed growth.

The second material which can be successfully used in annual plant beds in diphenamid (Enide). Available as a 50% wettable powder, this herbicide is recommended for use on a wide diversity of annual crops including aster, chrysanthemum, dahlia, marigold, petunia, phlox, salvia, shasta daisy, snapdragon, sweet william and zinnia at a rate of 5 pounds of active material per acre. Pre-emergent control of large crabgrass, annual bluegrass, yellow foxtail, goosegrass, ryegrass, pigweed, lambsquarter, smartweed, purslane, common chickweed, knotweed, pepperweed and shepherdspurse can be expected. As with Dacthal, irrigation immediately after application is recommended if maximum weed control is to be achieved. Also, if Enide is to be used on lighter, sandy soils, a lower application rate should be considered.

Trefluralin (Treflan) also has a broad, general purpose label which includes a great number of annuals and established flower crops. Available in either a 5% granular or a 4 pound emulsifiable concentrate formulation, Treflan in generally recommended for use as a pre-plant treatment at a rate of 1 pound of active ingredient per acre followed by mechanical incorporation to a depth of 1 inch. Treflan is safe for application on ageratum, allysum, aster, carnation, chrysanthemum, dahlia, marigold, periwinkle, petunia, phlox, portulaca, salvia, shasta daisy, snapdragon, sweet pea, sweet william and zinnia to cite a few of the more than 40 flower crops on the label.

At the 1 pound per acre rate, long lasting control of a wide variety of annual grass and broadleaf weeds including crabgrass, foxtail, goosegrass, annual bluegrass, pigweed, lambsquarter, purslane, chickweed and knotweed can be expected. In addition, if the annual beds have large amounts of organic matter present, it may be necessary to increase the rate of Treflan application in order to achieve the desired weed control.

Bensulide (Prefar or Betasan) is another pre-emergent herbicide registered for use on annual flowers, including alyssum, aster, dahlia, marigold, pansy, sweet pea, and zinnia. In addition, Betasan is labelled for use on several bulbous crops including daffodil, gladiolus, ranunculus, and tulip. Applied following transplanting and pre-emergent to weed seed germination, Betasan, in either the 12.5% granular or the 4% emulsifiable formulation, is used at the rate of 10 pounds of active ingredient per acre. Excellent control of annual grasses including, annual bluegrass, barnyardgrass, large crabgrass, foxtail, fall panicum and goosegrass can be achieved, however control of broadleaf weeds with Betasan is limited.

EPTC (Eptam) also has a label for use on several annual flowering crops, however it must be applied prior to transplanting and incorporated to a depth of 2-3 inches in the soil to be effective.



(Photo by T. A. Fretz)

Available as either a 7% emulsifiable concentrate, 5 or 10% granular, Eptam can be used safely on alyssum, ageratum, aster, begonia, chrysanthemum, dahlia, marigold, pansy, petunia and zinnia at a rate of 3 pounds of active material per acre. Control of a wide selection of annual and perennial grasses and broadleaf weeds including bermudagrass, ryegrass, purple and yellow nutsedge, quackgrass, foxtail, mugwort, purslane, lambsquarter and shepherds purse.

Lastly Chloramben (Ornamental Weeder) can be used in annual beds, however it is not recommended for use on plantings unless they have been established a minimum of 6 weeks. Applications of 4% Ornamental Weeder at 4 pounds of active ingredient per acre will control a wide assortment of weeds including chickweed, crabgrass, foxtail, lambsquarter, pigweed, smartweed and velvetleaf. Crops tolerant to Ornamental Weeder include celosia, chrysanthemum, dahlia, marigold, snapdragon and zinnia. Because plants need to be fully established for a 6 week period prior to the application of Ornamental Weeder, its usefulness is limited.

Lastly, one might consider a mulch in order to help reduce weed competition in annual plant beds. A 2 to 3 inch layer of organic mulch alone will help suppress weed growth, but it can also be applied after herbicide application. The mulch applied after herbicide application will help reduce herbicide losses due to volatility, but will also extend the period of useful weed control.

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IRRIGATION MAINTENANCE HOLDS PROMISE FOR CONTRACTORS

One possible stumbling block to an otherwise rosy future for irrigation systems is maintenance and the apparent fear of property maintenance personnel to tamper with a complex and carefully balanced network of pipes, wires and controls.

In an effort to dispel some of the fear and to point out very good potential for irrigation maintenance as a business for contractors, the Associated Landscape Contractors of America's Maintenance Committee organized and presented a program at ALCA's recent annual meeting in San Diego.

For three hours representatives from Rain Bird, Buckner and Toro provided basic instruction on controls, pipes and heads. Rod Bailey of Evergreen Services Corp., Bellevue, WA, chairman of the Maintenance Committee for 1979, suggested that irrigation installers don't want to do maintenance. Manufacturers try to help managers of large systems with training programs and do send representatives to diagnose problems where practical. But the owners or managers of medium- or small-size systems depend almost entirely on the installer at present. The maintenance contractor, especially if he already performs a service to the account, can provide irrigation maintenance service, according to Bailey.

Ron Smith, Evergreen Landscape and Maintenance of Lubbock, TX, moderated the session from a position of experience since he has made the move into the area of irrigation maintenance successfully. He outlined some of the problems of irrigation maintenance today as inexperienced personnel, lack of standard installation procedures, missing 'as built' plans to assist in location of components, and the need for alteration of landscapes to improve irrigation design, system efficiency and maintenance. Smith stressed the need to flush out a newly installed system before placing valves and heads.

Vincent Noletti of Buckner began the program with controller troubleshooting. He likened electricity to hydraulics, saying amps are similar to gallons per minute and volts are similar to pounds per square inch. Resistance relates to both systems and is measured in ohms for electricity. An understanding of electricity is necessary to figure out problems with controllers and to insure against shock hazards.

Trial and error is too time consuming and too costly Noletti stressed. There are key indicators which direct the maintenance technician to the real problem and make trial and error unnecessary.

There should be three wires to the controller: one hot wire, one common wire, and one ground. Controllers today are either electromechanical or solid state. They are interchangeable. The solid state controller requires more thoughtful programming. A record of the program should be kept in a secure but accessible place for reference. The solid state controller will be cheaper in the future, is more precise from a time standpoint, and is more difficult to change programs.

A maintenance technician should keep an extra control panel for each controller under his care. He should also have a wire cutter, wire stripper, amp meter, volt/ohm meter, water tight connectors, solenoid wrenches, valve wrenches, a fault locator, and a two-way radio.

Noletti presented three problem situations and what to check.

No valves operate by controller

1. check time of day on controller clock
2. check start wheel for times
3. check day wheel for right day
4. check start wheel adjustment
5. check on/off switch
6. check fuse or circuit breaker
7. check reset
8. check power supply with meter
9. check transformer, should reduce 120 volts to 24-30 volts
10. check fuse on transformer
11. check common wire connections
12. check common wires to valves
13. check wire splices by using as built plans
14. note any wire damage
15. check water pressure
16. check gate valve to system or back flow preventer
17. does controller cycle properly, if not replace panel

Continues on page 60



As-built plans are made after installation to record any variations from the original plans.

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Irrigation from page 59

One valve doesn't operate

1. try to turn on valve manually at controller
2. check power at terminal, at bad valve, and at controller connection board. If output is at connection board in the controller, then the problem is probably in the valve or the hot wire to the valve.
3. check valve wire connection
4. check resistance of circuit; should be between 15 to 25 ohms depending upon the manufacturer.

Valve won't close

1. advance control to off
2. check output to see if it is off; if not, replace panel

The best advice is always good checkout following installation to see that all circuits have .25 to .4 amps depending upon the manufacturer.

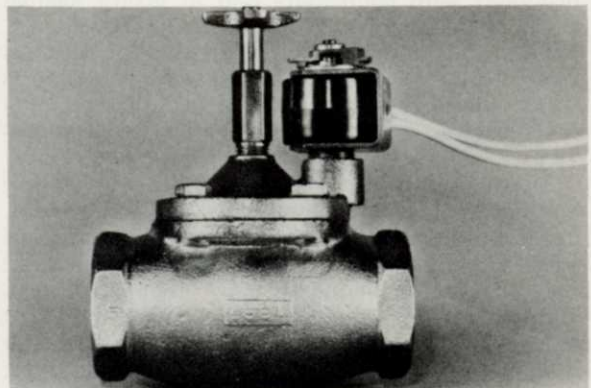
Rain Bird's Keith Kirby covered valve troubleshooting. He too stressed the need for as built plans, good water tight connection, and valve boxes.

Kirby narrowed valve problems down to four areas; no water in the system, low voltage, dirt clogging valve ports, and incorrect initial installation. There are basically two types of valves, electric or hydraulic. Hydraulic valves are usually found in warm climates only.

An electric valve is operated by current which causes the solenoid to open a port which bleeds water holding the diaphragm shut. It is a very delicate arrangement in which dirt can cause havoc. Any damage to the rubber diaphragm or blockage of ports hinders valve operation. A flow valve intended to regulate the flow of water through the valve can be closed by accident or by vandals. A closed flow valve would prevent the valve from opening even though current reached the valve as designed. A hole in the diaphragm or dirt in ports would keep the valve from shutting off. Solenoid failure would keep the valve from opening.

Kirby said there should be 40 to 50 psi in the main line for the valves to function properly. Flushing the lines twice before installing valves is recommended. When taking valves apart or putting back together care should be taken not to overtighten or strip threads.

Continues on page 62



Electric valve with solenoid and flow valve.