

*College of Agriculture & Life Sciences* **Installation and Maintenance of**  
**Department of Horticultural Science** **Landscape Bedding Plants**

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Use of bedding plant color beds continues to increase. A recent indicates that over 15% of the flowering bedding plants produced in this country are utilized by commercial landscapers. However, success with color beds requires planning, proper bed preparation, and an intensive maintenance program--all of which are outlined below.

**Plant Selection and Acclimation**

There are many varieties (cultivars) of bedding plants available. The All America Selections program evaluates bedding plants. Their winners usually perform well in most landscape situations. Visit trial gardens in your area to become familiar with the landscape performance and characteristics of bedding plants. Also, consult with your suppliers and seed company representatives for varieties especially adapted for the Southeast.

After deciding on the varieties to be used, select high quality plant material. In the client's eyes, instant color is a high priority. However, for successful long-standing color, choose plants that also have established root systems. Shoots and roots are a more important selection criteria than number of flowers at time of purchase.

Acclimating bedding plants to outdoor conditions prior to planting helps assure survival and rapid growth after transplanting. Most bedding plants are produced in a greenhouse under much less

stressful conditions than in the landscape. Ideally, bedding plants should be set outside for 7 to 10 days prior to transplanting. Partial shade during the first 3 to 4 days is beneficial, allowing the plants to acclimate to the outdoor environment. Acclimated plants recover from transplant shock more quickly than untreated plants, but acclimation requires time, space, and labor.

**Pre-Plant Bed Preparation**

The first stage in color bed planning to coordinate the design with the landscape architect. Color beds should blend in with or accent the existing landscape. Leave adequate "buffers" around established plants. Do not create beds under shallow-rooted trees or in areas where tilling would damage roots of plants already present in the landscape.

If the landscape site is a new account, try to acquire the "history" of the color beds. Past species grown may give an indication of potential disease problems. Find out which (if any) preemergence herbicides have been used that may affect plants you intend you use.

Follow proper soil preparation procedures before planting. Rake off any existing mulches before beds are tilled and/or amended. Do not incorporate organic mulches into the soil unless the material is composted. If needed, add amendments such as pine bark humus to improve drainage, water infiltration, and

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moisture retention. Take soil samples for testing after incorporating physical amendments and prior to adding chemical amendments. Add any needed fertilizer and lime based on soil test results.

Beds should be fumigated for weed control as well as suppression of insects and pathogens. Fumigation can be done prior to amending the beds, if the amendments are relatively weed- and pest-free.

Methyl bromide is commonly used for bed fumigation. It is a highly toxic liquid that volatilizes into a gas when the canister is opened. Beds should be covered with a polyethylene tarp before treatment, sealing all edges with soil. Follow label instructions for details on use. The tarps should cover the area for a minimum of 24 hours then removed for aeration. Do not plant for 7 to 10 days after the tarp has been removed. Some species of bedding plants including dianthus, carnations, snapdragons, and salvia are sensitive to methyl bromide and should not be planted in beds treated with methyl bromide.

Diazomet (Basamid™) is a granular soil fumigant that can be broadcast with a spreader. Diazomet is less toxic than methyl bromide and does not require special application equipment. After application, till the granules into the soil and seal the soil surface either by compacting the soil surface with a roller, by watering to seal surface cracks, or by covering with plastic. The soil should be moist for best results. The recommended soil temperature at application is 54 to 64 °F. To ensure the soil is safe for planting, conduct the following bioassay to test for fumigant activity beginning 7 to 14 days after treatment: ❶ Half-fill individual jars with soil samples taken from the treated area. One sample should be taken from a non-treated area to serve as a check. Take samples from a 3 to 4 inch depth in the beds. Replace the jar lids immediately after sample collection to prevent any chemical loss from volatilization. ❷ Moisten cotton balls with water until they are saturated. ❸ Dip the moistened balls in lettuce seed and place one ball, seed side up, in each jar with the soil sample. Quickly replace the lid to minimize the escape of any volatilized fumes from the jar. ❹ Place the jars in a warm, sunny location. Lettuce seeds usually germinate in 2 to 3 days under these conditions. ❺ Compare the germination of seeds placed in treated and untreated soil. Reduced or delayed germination

of the seed in the treated soil sample jar indicates that chemical residues are still in the soil and it is **unsafe** for planting. ❻ Repeat the procedure at 5 to 7 day intervals until the bioassay indicates it is safe to plant.

Aerated steam is an alternative soil fumigant. It is very safe, but requires a steam generator, an aerator, a steam injecting system such as canvas tubes, and a tarp for covering the bed during steaming. Aerated steam is not used much in the landscape, but steam may be used more in the future as we lose soil fumigants. Heat beds to 180 °F, and maintain this temperature for 30 minutes. This treatment is sufficient to kill most plant pathogens, insects, and weeds; some weed seed will survive.

### **Installation of Plants**

Plants should be placed in the bed at the same depth as they are in the pot. Planting too deep can increase disease problems, and planting too shallow results in weak, poorly anchored plants. Plant in soil, do not plant in mulch. Mulches do not supply sufficient nutrients and moisture for bedding plants. Preformed planting holes are beneficial for assuring proper plant spacing and in reducing damage to roots during transplanting. Finally, water plants well soon after planting to reduce transplant stress.

Plants should be spaced so beds will be full but not crowded. Placing plants too close together is expensive, and crowded plants increases the chance for disease problems in the landscape. Spacing depends mainly on the plant variety and the mature size of plants (Table 1). Initial size of the transplants and customer patience in waiting for plants to fill in the beds also affect spacing. For more uniform beds, use triangular (equilateral) spacing rather than square (row) space (Table 2). With triangular spacing, plants in rows are staggered. Spacing is equal between plants which means that in-row spacing of plants is greater than the space between rows, as shown in Table 2. Although triangular spacing requires more plants per square foot, the resulting mass planting effect is more attractive than plants placed in rows.

### **Mulching Color Beds**

Mulches retain moisture, suppress weed growth, keep soil from splattering on plants, and are aesthetically more attractive than bare soil. Use a 2

to 3 inch depth between bedding plants but apply only about 1/2 inch around the collars of plants; excess mulch against the plants can increase disease problems. Many materials can be used as a mulch--bark nuggets, pine straw, bark chips, and composted leaf mold are all acceptable. If organic mulches are used, the effectiveness (efficacy) of preemergence herbicides can be greatly reduced. Many herbicides adhere to organic material and are deactivated.

### “Dead Heading” Bedding Plants

“Dead heading” is the removal of dead or faded inflorescences from bedding plants. Dead heading increases the attractiveness of plants, reduces the chances for diseases such as *Botrytis*, and stimulates flowering in many species. Bedding plants that benefit from dead heading include celosia, coleus, dahlias, geraniums, gloriosa daisy, marigolds, salvia, and zinnias (varieties of *Z. elegans*). Beds should be checked at least every week for dead and faded inflorescences.

### Pruning


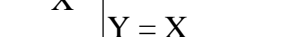





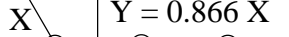




Some bedding plants such as hypoestes and impatiens may require pruning back for size control. Others such as gomphrena can be pruned or sheared into shapes. Pruning can also stimulate greater flowering, as with some varieties of petunias. Cut

**Table 1. Suggested spacing for bedding plants in the landscape.**

| Plant species   | Inches between plants |
|---|-----------------------|
| African daisy, ageratum, browallia, dwarf celosia, dwarf hypoestes, lisianthus, lobelia, dwarf french marigolds, pansies, sweet allyssum, dwarf zinnias   | 6"                    |
| asters, begonias, candytuft, coleus, cornflower, dahlberg daisy, dianthus, dusty miller, gloriosa daisy, nicotiana, petunias, phlox, portulaca, medium-sized marigolds, dwarf salvia, sanvitalia, dwarf snapdragons, treasure flower, and upright vinca | 8"                    |
| blanket flower, calendula, celosia, coreopsis, cosmos, dahlia, geraniums, gomphrena, hypoestes, impatiens, large marigolds, ornamental peppers, large petunias, large salvia, large snapdragons, verbena, trailing vinca, and large zinnias             | 10"                   |
| large geraniums   | 12"                   |
| melampodium, spiderflower   | 14"                   |

back plants as needed. Leave approximately 1/2 of the shoot length on shoots to be pruned. For petunias that require pruning, use “stagger pruning,” to allow some color to remain while pruned plants grow out and begin to flower again. Stagger pruning consists of pruning 1/3 of a petunia bed (every third plant) each

**Table 2. Estimated number of plants to fill 100 ft<sup>2</sup> of bed area for square (row) and triangular (equilateral) planting patterns using 4 to 14 inch spacing distances.**

| Planting pattern   | Inches between rows of plants (Y)   | Inches between plants (X) within rows | Estimated number of plants per 100 square feet |      |
|--|---|---------------------------------------|--|------|
| <u>Square</u>  |   |                                       |  |      |
| FOR SQUARE SPACING, THE DISTANCE BETWEEN PLANTS WITHIN ROWS (X) EQUALS THE DISTANCE BETWEEN ROWS (Y).  |  | 4                                     | 4  | 900  |
|  |  | 6                                     | 6  | 400  |
|  |  | 8                                     | 8  | 225  |
|  |  | 10                                    | 10   | 144  |
|  |  | 12                                    | 12   | 100  |
|  |  | 14                                    | 14   | 74   |
| <u>Triangular</u>  |   |                                       |  |      |
| FOR TRIANGULAR SPACING, THE DISTANCE BETWEEN PLANTS WITHIN ROWS AND BETWEEN ROWS BOTH EQUAL X, AND THE DISTANCE BETWEEN ROWS (Y) EQUALS 0.866 X. |  | 3.46                                  | 4  | 1039 |
|  |  | 5.20                                  | 6  | 462  |
|  |  | 6.93                                  | 8  | 260  |
|  |  | 8.66                                  | 10   | 166  |
|  |  | 10.39                                 | 12   | 115  |
|  |  | 12.12                                 | 14   | 85   |

week for 3 weeks. By week 3, the first plants pruned will be in flower once again, assuring some color during the entire pruning period.

### **Watering Bedding Plants**

Color beds should not be on the same watering system or schedule as turf or foundation shrubs. Turf requires more and shrubs less supplemental irrigation than do bedding plants. Many types of water delivery systems can be used for bedding plants. Drip emitters, ooze tubes, pop up sprinklers, or overhead sprinklers are all effective. However, systems that do not wet foliage and flowers are preferable. Wet foliage and flowers increase the chance for diseases. If water is applied overhead, refrain from irrigating during the heat of the day or plants could be damaged from sun scald. The best time to irrigate is early in the morning.

### **Weed Control in Color Beds**

Weeds can be controlled by hand pulling, hoeing, fumigation or herbicides. Due to the large number of flower species used in landscapes, no one herbicide can be used for general weed control in color beds. Preplant fumigation in combination with hand weeding is the most feasible method of weed control for bedding plants.

There are preemergence herbicides labeled for many of the more common bedding plants. When using any herbicide, read and follow the label carefully. Apply only to species on the label, and apply only as recommended. For example, some preemergence herbicides are labeled only for established bedding plants and would damage plants if used too soon after transplanting. Some widely used preemergence herbicides include bensulide (Betasan™), DCPA (Dacthal™), EPTC (Eptam™), metolachlor (Pennant™), napropamide (Devrinol™), and trifluralin (Treflan™). As mentioned previously, many preemergence herbicides bind to and are inactivated by organic material. If beds are amended or mulched with organic matter, herbicide effectiveness may be reduced. Make sure you know

the rotation of the bed prior to using a preemergence herbicide. For example, if spring bulbs such as daffodils or tulips will be planted in the same bed during the fall, it would not be wise to treat the bed with EPTC.

Some post-emergence herbicides are also labeled for bedding plants. Widely used post-emergence herbicides include fluaziflop 2000 (Ornamec™), glyphosate (Roundup™), potassium salts of fatty acids (DeMoss™ and Sharpshooter™), and sethoxydim (Poast™). Read and follow the label carefully. Many of these materials are labeled only as a directed spray and are not safe to apply overhead to bedding plants. Check with the Extension Service Center in your county for specific weed control recommendations.

### **For Further Information:**

*Bed Preparation and Fertilization Recommendations for Bedding Plants in the Landscape.* Horticulture Information Leaflet No. 551. 1994. Dept. of Hort. Sci., North Carolina State University.

*Mulches.* Horticulture Information Leaflet No. 608. 1989. Dept. of Hort. Sci., North Carolina State University.

*Selection and Use of Stress-Tolerant Bedding Plants for the Landscape.* Horticulture Information Leaflet No. 552. 1994. Dept. of Hort. Sci., North Carolina State University.

*Using Compost in Landscape Beds and Nursery Substrates.* AG-473-14 (WQWM-121). 1993. North Carolina Cooperative Extension Service, North Carolina State University.

*Weed Control in Flower Beds.* Horticulture Information Leaflet No. 644. 1991. Dept. of Hort. Sci., North Carolina State University.

*Weed Control Suggestions for Christmas Trees, Woody Ornamentals, and Flowers.* AG-427. 1992. North Carolina Cooperative Extension Service, North Carolina State University. (\$4.00)