Annuals and Perennials

Annuals and herbaceous perennials are popular because they have flowers and foliage that is valued for their ornamental value.

Annuals

- Annuals complete their life cycle in one growing season
- Annuals in Arizona are categorized by the time they flower. In the low and intermediate elevation desert in Arizona we distinguish summer and winter annuals. Summer annuals are planted after the last frost and will bloom throughout the summer, while winter annuals are planted in fall and will bloom into early spring. Winter annuals cannot tolerate the high temperatures in summer, while summer annuals cannot tolerate the low temperatures in winter.
- Annuals planted at higher elevations (4,000 feet and above) are generally all planted after the last frost and do not survive in winter.
- Annuals provide instant color and have a long season of bloom
- Bed preparation for annuals, similar to vegetable beds, is labor intensive.
- Some annuals have high maintenance requirements beyond the regular fertilizing and irrigation (e.g. dead heading)
- Important winter annuals:
  petunia, pansy, snapdragon, alyssum, geranium, lobelia
- Important summer annuals:
  vinca, pentas, angelonia, ipomoea, celosia, portulaca, and lantana, a perennial used as annual.

Perennials

- Last several years depending on species
- Provide seasonal color
- May die back during their off season (winter or summer)
- Require maintenance (deadheading, cutting back, fertilizing, mulching, dividing)
- Many perennials are used as annuals
- Grasses are low maintenance, low water use perennials that provide year-round interest.
- When planting perennials consider:
  light requirement, good soil drainage, time of bloom, plant height, flower color, foliage color and persistence

Selecting a good quality bedding plant

Selecting a good quality bedding plant is important to ensure successful transplanting, establishment, and good performance. Plants that are at the right stage for transplanting will be ready to grow vigorously in their new environment in the landscape. Those that are too small or overgrown will either establish very slowly or not at all.

Good quality plants should have:

- Large enough top for the size container they grow in
- Healthy green or appropriate color foliage
- Regular size leaves, and no damaged leaves, stems, or flowers
- Good number of flower buds and a few open flowers
- Roots visible throughout root ball with healthy white root tips
- No mat of circling roots at the base or sides of the root ball

If the top is too small, plants may be too young and not ready for transplanting. Sometimes those plants have not enough roots to hold the root ball together when it is taken out of the container. Often they also lack flower buds.

Overgrown plants that stayed too long in the container have a top that is too large for the size container it is growing in. Their foliage is often light green or yellow, they have few flowers, and few or no flower buds. Roots often form a thick mat at the bottom and outside the root ball.



The plants in the six-cell pack on the left are good quality with healthy foliage, flowers, and flower buds. They have an appropriate size for the size container they grow in. The root balls show healthy roots and are just starting to circle at the bottom (middle picture). Loosening the root with allow them to grow into the surrounding potting soil after planting (right picture).

Successful preparation, planting, and after-care of annual and perennial beds

Planting bed preparation

- Remove debris and weeds from the area to be planted
- If possible irrigate a day or two before starting bed preparation
- Evenly spread a layer 3-4 inches thick of organic material such as well cured compost on top of planting bed
- Evenly sprinkle a moderate amount of sulfur and fertilizer (see bag instructions) over the planting area
- Incorporate compost and fertilizer with a shovel or rototiller to a depth of 8-12 inches, rake planting bed to level and smooth surface

Planting

- Start planting in a corner with half the distance of on center distance from the edge
- Measure with a trowel in all directions how far you need to move
- Each planting hole should be about the size of the root ball
- Gently loosen root ball if necessary and set in planting hole
- Plant at crown level, not too high and not too deep, barely cover top of container media with soil
- Pinch off any damaged plant parts, spent flowers or yellow leaves
- Gently fill and tamp soil around plant, do not pack soil hard around the plant
- Water by hand every half hour or every section
- Do not leave tags from nursery container in the planted bed
- Mulch to a depth of 1” to 2” as appropriate for plant species
- When finished planting, water again
- Water every other day until plants can go on a regular schedule depending on weather

Follow-up care

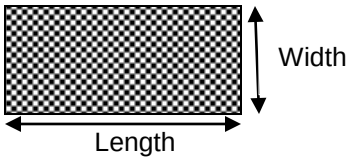
- Set irrigation to a schedule based on the local soil conditions and weather
- Fertilize every 3-6 weeks with a balanced fertilizer to stimulate growth and flowering
- Deadhead spent flowers down to a lower branch or leaf base
- Inspect plants for insects and disease, remove dying plants, and treat as appropriate
- Inspect bed for weeds and if present remove
- Inspect if mulch needs replacement

How to determine materials needed to install flower beds

1. Calculate area to be planted for each species.
2. Find out the species or cultivars to be used and their spacing.
3. Find out how many plants are in one flat (or what size container).
4. Calculate number of flats needed from table.

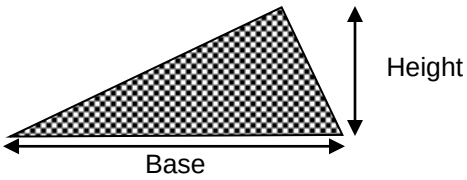
Calculating area

Rectangle



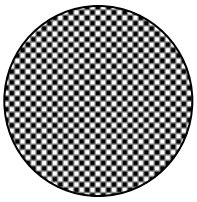
Area = Length x Width

Triangle



Area = Base x Height/2

Circle



Area =
3 x Diam. x Diam./4
(approximately)

Planting on center (OC)
Refers to the distance between plants: 6 inches OC
Each plant occupies 36 square inches

6 in.

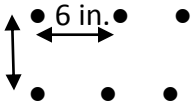


Table to determine the area one flat of plants covers at different plant spacings.

Distance between plants (inches)	Plants per square foot	Plants per flat												
		4	9	16	25	36	42	48	49	60	64	72	81	90
		Area covered (square feet)												
4	9.00	0	1	2	3	4	5	5	5	7	7	8	9	10
6	4.00	1	2	4	6	9	11	12	12	15	16	18	20	23
8	2.25	2	4	7	11	16	19	21	22	27	28	32	36	40
10	1.44	3	6	11	17	25	29	33	34	42	44	50	56	63
12	1.00	4	9	16	25	36	42	48	49	60	64	72	81	90
15	0.64	6	14	25	39	56	66	75	77	94	100	113	127	141
18	0.44	9	20	36	56	81	95	108	110	135	144	162	182	203
24	0.25	16	36	64	100	144	168	192	196	240	256	288	324	360

Example 1.
The bed to be planted is 10 feet wide and 21.5 feet long which makes an area of 215 square feet.
The plants will be spaced 6" on center. They are available at the nursery with 36 plants per flat.
Using the table above, we know that plants planted 6 inches on center will require 4 plants per square foot. Since you know that your plants are available in 36 plants per flat you also know that at this spacing one flat of plants will cover 9 square feet. Therefore, calculate 215 (area to be covered) / 9 (area covered by one flat) = 23.88 flats required, round up to 24 flats.

Number of plants required per 100 square feet at various plant spacing
(OC = on center and refers to the distance from one plant to the next).

Spacing (inches OC)	Plants per 100 sq ft	Spacing (inches OC)	Plants per 100 sq ft
4	900	18	44
6	400	24	25
8	225	30	16
9	178	36	11
10	144	48	6
12	100	72	3
16	56		

Example 1.
The bed to be planted is 10 feet wide and 21.5 feet long which makes an area of 215 square feet.
The plants will be spaced 6" on center, They are available at the nursery with 36 plants per flat.
At 6" OC 100 sq ft requires 400 plants (see chart above)
400 plants/100 sq ft x 215 sq ft = 860 plants needed
860 plants needed / 36 plants per flat = 23.88 flats = 24 flats needed

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Mulch or amendment requirements

How many cubic feet or cubic yards are needed? (1 cubic yard = 27 cubic feet)

Area Square feet	**Cubic feet needed to cover area to a depth of:**			**Cubic yards needed to cover area to a depth of:**		
	1"	**2"**	**3"**	**2"**	**3"**	**4"**
25	2	4	6			
50	4	8	13			
75	6	13	19			0.9
100	8	17	25	0.6	0.9	1.2
200	17	33	50	1.2	1.9	2.5
300				1.9	2.8	3.7
400				2.5	3.7	4.9
500				3.1	4.6	6.2
600				3.7	5.6	7.4
700				4.3	6.5	8.7
800				4.9	7.4	9.9
900				5.6	8.3	11.2
1000				6.2	9.3	12.4

Mulch refers to material that is added on top of the soil and remains there to conserve soil moisture, moderate soil temperature, and prevent weed establishment. Mulch can be organic such as compost or pine bark or inorganic such as gravel.
Organic amendments such as compost refer to material that is evenly spread over the top of the soil and then incorporated to a depth of 8-12 inches before planting annuals or herbaceous perennials.