Agricultural Extension Service
The University of Tennessee
PB1659

Weeds in Ornamental Plantings:

A Management Plan For Tennessee Homeowners







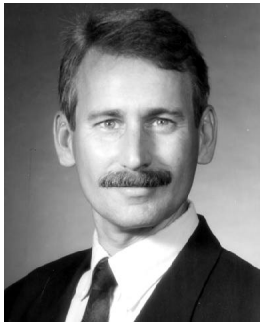


Weeds in Ornamental Plantings:
A Management Plan For Tennessee Homeowners

'Weeds in Ornamental Plantings: A Management Plan For Tennessee Homeowners' is provided by The University of Tennessee Agricultural Extension Service to assist you, the homeowner, with managing weeds in your ornamental plantings. This reference provides an integrated approach to minimizing weeds in which well-planned application of herbicides is just a part of the overall approach. This manual is meant as a reference and is not intended to replace reading and understanding the directions in the actual herbicide product label. The use of example brand names or trade names in this publication is intended to aid in clarity, and does not imply approval of the product to the exclusion of others of similar or suitable composition, nor does it guarantee or warrant the standard of the product. Should the registration of a herbicide be canceled prior to revision of this manual, it would no longer be recommended by The University of Tennessee.



Darren K. Robinson
Assistant Professor
Plant and Soil Science



This helpful information has been developed for use by Tennessee homeowners with direction on content and format from Joseph Neal, North Carolina State University, Department of Horticultural Science. Joe wrote a manual for professional landscape maintenance while at Cornell. It is published as ***WeedFacts No. 5***, a Cornell Cooperative Extension publication, Cornell University, Ithaca, NY.

Acknowledgments of Contributors: Although only primary contributors are listed, several key individuals contributed to the creation and completion of this manual. The primary contributors wish to express sincere gratitude for the efforts provided by the following individuals:

Kevin Rose, **Michael Smith**, **Jim Johnson**, **Bob Ary**, **Bill Wyatt**, **Doug Dalton**, **Hugh Conlon**, **David Vandergriff** and **Kevin Hensler** (Agricultural Extension agents with The University of Tennessee Agricultural Extension Service and Agricultural Extension agent with Tennessee State University, respectively) for expressing the need for this reference and insightfully reviewing the manuscript.

Lois Stinnett (senior secretary, Plant and Soil Sciences) for her patience and expertise in developing and formatting the text and tables for the manuscript.

Carol Reese, **Donna Fare**, **Bob Hayes**, **Bill Klingeman** and **Elmer Ashburn** (Area Specialist, The University of Tennessee — Ornamental Horticulture and Landscape Design; Research Horticulturalist, United States Department of Agriculture, Agricultural Research Service; Professor, The University of Tennessee — Plant and Soil Sciences; Assistant Professor, The University of Tennessee — Ornamental Horticulture and Landscape Design; and Professor and Extension Coordinator, The University of Tennessee — Plant and Soil Sciences, respectively) for their valuable time and expertise in review and insightful suggestions for improving this publication.

Gary Dagnan (communication specialist, The University of Tennessee — Agricultural Communications) for his patience, expertise and especially for his individual creativity in formatting this publication into its present form.

Table of Contents

Weeds in Ornamentals 6

Weed Management Plan 6
- Site Assessment 6
- Choice of Plant Type 6
- Species Selection 8
- Site Preparation and Establishment 8
- Minimizing Weeds After Establishment 9
- Herbicide Use in Ornamental Plantings 10
- Summary 10

Weed Types and Life Cycles 11
- Types 11
- Life Cycles 11

Weed Identification 12
- Broadleaf Weeds 12
- Grassy Weeds 13
- Sedges 14

Table 1. Summary of Weed Management Options: Dependent on Type of Ornamental Planting 15

Table 2. Commonly Used Mulches: Advantages and Disadvantages 16

Table 3. Herbicide Options for Homeowner Use in Ornamental Plantings 17

Table 4. Herbicide Rates, Application Methods, Use Directions and Precautions 19

Table 5. Herbicide Activity Towards Common Weeds of Ornamental Plantings 24

Table 6. Problem Weeds in Ornamental Plantings: Control Recommendations 26

Weeds in Ornamental Plantings: A Management Plan For Tennessee Homeowners

Weeds in Ornamentals



This publication provides helpful suggestions to assist you as a homeowner in managing weeds in your ornamental plantings. For assistance with managing weeds in your lawn, refer to The University of Tennessee Agricultural Extension Service publication, PB956, *'Managing Lawn Weeds: A Guide For Tennessee Homeowners,'* which is available at your county Agricultural Extension Service office, or via the Internet at **www.utextension.utk.edu/pubs.htm**

Weed Management Plan



The overall objective of a weed management program for ornamental plantings is to minimize the need for hand-weeding or physical removal of weeds. The following five-step process should assist you in minimizing weeds in your ornamental plantings:

1. **Site Assessment**: Avoid a problem where you can.
2. **Choice of Plant Type**: Dictates control options.
3. **Species Selection**: Dictates herbicide options.
4. **Site Preparation and Establishment**: Gaining control of perennial weeds.
5. **Minimizing Weeds After Establishment**: Mulches and/or herbicides.

Site Assessment:



Site with Purple Nutsedge (an aggressive perennial weed)



Purple Nutsedge, seedhead

Site assessment for landscape plantings is usually not based on weeds but functional use and aesthetics. However, avoid a problem where you can; assess the site for presence of perennial weeds. Perennial weeds may influence your choice of plant type. In certain annual or herbaceous perennial plantings, weed control options are limited, especially for perennial weeds. Ideally, perennial weeds should be controlled prior to establishing an ornamental planting. Controlling perennial weeds after planting may be very difficult and frustrating. Hand removal may be your only option. Control of perennial weeds prior to planting is discussed in the 'Site Preparation and Establishment' phase.

Choice of Plant Type:

Your choice of plant type will dictate or limit your options for minimizing weeds after establishment of the ornamental planting.

Types of Plantings:

- *Woody Trees and Shrubs*
- *Woody Ground Covers*
- *Annual Flower Beds*
- *Herbaceous Perennial Beds*
- *Mixed Plantings*

Woody Trees and Shrubs — Plantings of woody trees and shrubs have the most weed management options, including the use of non-selective herbicides to spot-treat weeds.

Control options include:



- A landscape fabric or weed barrier if the planting is going to be in place for an extended period (generally four or more years). Landscape fabric acts as a barrier to weed emergence but allows passage of water and air. Landscape fabric should be covered with mulch to prevent breakdown by exposure to sunlight and to improve attractiveness.



- Mulch, with or without landscape fabric, is essential. Without landscape fabric, the mulch layer should be 2 to 3 inches thick, with 3 inches being optimum. With landscape fabric, the thickness of the mulch layer can be 2 inches, but 3 is preferred. Mulch restricts light from reaching underlying soil and limits weed seed germination. The mulch, regardless of the type used, needs to be coarse-textured, allowing water and air to pass through freely.
- Non-selective herbicides can be used to control escaped weeds by directing the application under the ornamental foliage, not contacting young succulent stems. Planting should be uniformly mulched to prevent the herbicide from contacting exposed roots.
- Preemergence herbicides can be used with these plantings to prevent weed seedlings emergence. Preemergence herbicides do not control established weeds and have limited activity towards perennial weeds. For the control of annual weeds, preemergence herbicides should be applied prior to weed emergence or to weed-free surface after removal of established weeds.
- Control of perennial weeds prior to establishment is less critical but very beneficial in these types of plantings. Directed applications of a non-selective herbicide will aid in controlling escaped perennial weeds.

Woody Ground Covers — This type of planting allows limited use of non-selective herbicides. Once the planting begins to spread, access to emerged weeds under the foliage may be limited to physical removal.



Control options include:

- Landscape fabric may be used where the fabric will not restrict the spread and root growth of the woody ground cover.
- A mulch layer is the best defense towards minimizing weeds. A mulch layer, alone or in combination with landscape fabric, will minimize the germination of annual weeds.
- Selective post-emergence herbicides can be used to control grass weeds (without activity towards broadleaf weeds) with very low risk of injury to most ornamentals (that are not ornamental grasses). Application of a selective herbicide for grass weeds should be made when these weeds are small and newly emerged. For perennial grasses, repeat applications will likely be required. Control of emerged broadleaf weeds is limited to physical removal and you should freshen up or add to the mulch layer to limit further germination.
- Preemergence herbicides can be used in plantings of most species of woody ground covers.
- Pre-plant control of aggressive perennial weeds is essential, especially for perennial broadleaf weeds in this type of planting.

Annual Flower Beds — Options for minimizing weeds are most limited in this type of planting. Options are essentially limited to physical removal of escaped weeds, especially broadleaf weeds and an effective mulch layer (where growth of desired ornamentals is not restricted by mulch). Selective postemergence herbicides may be used to control newly emerged grasses. Preemergence herbicides cannot be used when establishing a planting from seed. Use may also be limited after seedlings have become established or after setting transplants (read the preemergence herbicide label carefully for species tolerance and timing of application).

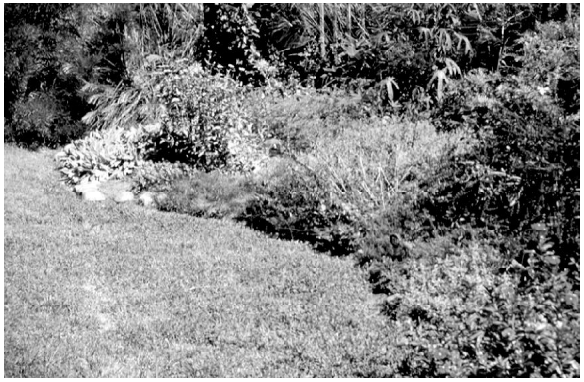


Herbaceous Perennial Beds — Options for minimizing weeds in this type of planting are similar to those for annual flower beds. However, control of perennial weeds prior to establishment is essential, because the planting will be in place for a longer period of time, favoring the development of perennial weeds. Control of perennial broadleaf weeds will be limited to hand removal. Newly emerged grass weeds may be controlled with a postemergence grass herbicide that selectively controls grass weeds without injury to the desired ornamental species (read the product label for species tolerance and timing of application).



Preemergence herbicides are limited for perennial beds; thus, check the product label for tolerance prior to application.

Mixed Plantings — Options for minimizing weeds in mixed plantings of woody and herbaceous annuals or perennials are the most limiting, due to the diversity of species present. Options are limited to an effective mulch layer, preemergence herbicides (where possible), postemergence herbicide selective for grass weeds and physical removal of escaped weeds (especially broadleaf weeds).



Species Selection (based on herbicide options):

If you plan to use preemergence herbicides, choose plant species that you know are tolerant to the herbicide or herbicides you intend to use (this will require you to review the herbicide product use label prior to establishment). All too often the decision to use preemergence herbicides is made after the fact and options are very limited. Preemergence herbicides are often a new tool for many homeowners and may require some experimentation to get a system with which you are comfortable.

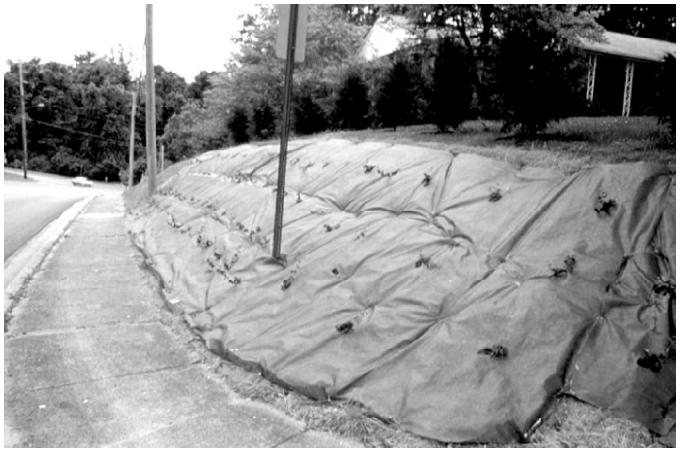
Site Preparation and Establishment:

During site preparation or prior to establishing an ornamental planting is the best time to control perennial weeds. Controlling perennial weeds after planting may be very difficult and frustrating. An aggressive lawngrass now becomes a perennial weed. Prior to planting, weeds can be controlled by hand weeding, repeat cultivation, repeat applications of a non-selective (controls both broadleaf and grass weeds) systemic (controls both above and below ground growth of perennial weeds) herbicide or a combination of these procedures, such as repeat cultivation and non-selective herbicide applications.



Perennial weeds are best controlled in the fall using these methods. Spring or fall is the best time to establish ornamental plantings. However, spring is the most popular time of year. Prior to establishing a new planting, allow enough time to make two applications of a non-selective herbicide. A good approach is to make an initial application and then repeat three weeks later to control regrowth of perennial weeds. Allow a week after the second herbicide application before tilling or working up the soil.

If the planting is going to be in place for an extended period of time (generally four or more years), a landscape fabric or weed barrier may be beneficial if the planting is of woody trees and shrubs or a woody groundcover (if the fabric will not impede rooting or spread). Landscape fabric will need to be covered with mulch (2 inches).



Do not use black plastic, as plastic impedes water and air movement to the root zone of the ornamental plants.



An effective mulch layer 2 to 3 inches thick is critical to minimizing the germination and emergence of annual weeds. Use a mulch that is coarse-textured (not fine) and does not hold water, providing conditions for weed seed germination on top of the mulch layer.





Edging of landscape beds with some sort of physical barrier, such as a small trench or landscape edging of rigid plastic, bricks or stones, may be helpful. Edging creates a physical barrier that serves to keep the mulch in the plant beds and separates the lawn from the bed, aiding in preventing the lawngrass encroachment into the landscape beds. To minimize the need for the weed trimmer, establish the edging to give you smooth lines (curves, not right angles); with stones or bricks, minimize cracks that are hard to reach with the mower.

In addition, choose plant material that is weed free. Don't bring problem weeds home with you.

Minimizing Weeds After Establishment:

To minimize weeds after establishment, your key tool is maintaining an effective mulch layer (spruce up in spring and fall, as required). Escaped weeds may be controlled with a non-selective herbicide, where possible. If a non-selective herbicide cannot be used, then you are limited to hand removal of emerged broadleaf weeds, followed by additional mulching where the weeds were removed. Emerged annual and perennial grass weeds can be controlled in most non-grass ornamental plantings with an herbicide that is selective for just grass weeds. Treat when grass weeds are small. Perennial grasses will likely require repeat applications. In addition to the mulch layer, certain preemergence herbicides can be used to prevent annual weeds from developing from seed. Where landscape fabric is used in combination with mulch, a preemergence herbicide may not needed.

Herbicide Use in Ornamental Plantings:

Adopting the use of herbicides is a personal choice requiring the expenditure of time, getting to know the products available, understanding what they will and won't do and following directions for use in gaining the best weed control without injury to your ornamentals.

Preemergence herbicides act by preventing weeds from establishing or emerging from seed. Preemergence herbicides are applied after planting or to established beds prior to weed seed germination or after removal of any established weeds. Preemergence herbicides do not control weeds once they have become established. Preemergence herbicides may provide control of broadleaf and grass weeds. Not all weeds will be controlled. Read the label for specific weeds controlled. For the homeowner, preemergence herbicides are often formulated as granules to be broadcast over the surface of the ornamental bed. Rainfall or irrigation after application is required to dissolve the granules and move the herbicide throughout the mulch and the underlying soil where it contacts weed seeds or seedlings, preventing them from becoming established. Optimum weed control requires uniform application and one-half inch of rainfall or irrigation soon after application. Preemergence herbicides provide residual control, acting over an extended period of time. Over time, the herbicide breaks down or loses effectiveness, requiring timely re-treatment throughout the growing season to prevent weeds from escaping. Length of residual control or timing of re-treatment is product-dependent (refer to the product label). Generally, preemergence herbicides fail due to non-uniform application, lack of timely rainfall or irrigation and untimely re-treatment.



Postemergence herbicides control weeds after they have emerged or become established. These herbicides are formulated to be mixed with water and applied as liquid spray to the weed foliage using a garden sprayer (hand-held or back-pack type). Postemergence herbicides act by contacting the foliage. Systemic postemergence herbicides are absorbed into the foliage and move throughout the plant. Herbicides are available that will selectively control emerged annual and perennial grasses in most ornamental plantings (not for use around ornamental grasses). Non-selective herbicides control both grass and broadleaf weeds. Obviously, use of this type of herbicide may not be an option in certain plantings or limited to spot treatment or directed application (avoiding contact with foliage and young stems of desired ornamentals).



Summary of Weed Management Plan

In summary, weeds in ornamental beds can be perpetual problems. Certain steps can be taken to minimize the need for frustrating physical removal of weeds from your ornamental plantings. Plan before you plant and gain control of perennial weeds prior to planting. After establishment, your best defense for minimizing weeds is to maintain an effective mulch layer that is 2 to 3 inches thick (3 inches being optimum when landscape fabric is not used); use a coarse-textured mulch that does not hold water and is from a weed-free source. Landscape fabric covered with mulch may be beneficial in plantings of woody trees and shrubs and woody ground covers (where the landscape fabric will not limit rooting and spread). Use a fabric that will provide a barrier to weed emergence and still allow water and air to move through to the underlying roots of desired ornamentals. Where possible, a non-selective herbicide may be directed for spot treatment under desired ornamentals to gain control of

established weeds. If a non-selective herbicide cannot be used, then established broadleaf weeds will have to be physically removed. Established grass weeds can be controlled with a selective herbicide in most ornamentals. Plan before you plant. Gain control of perennial weeds prior to planting.

Weed Types and Life Cycles:

Weeds of ornamental plantings can be divided into three types: broadleaf weeds, grassy weeds and sedges. Within each type, weeds may have one of three basic life cycles: summer annual, winter annual or perennial.

Types:

Broadleaf weeds — Broadleaf weeds are generally easiest to identify. Broadleaf weeds (like dandelion and clover) have leaves that are broad, and are generally produced in pairs or multiples. Leaves are detached from the main stem by a sub-stem or petiole. Leaves may be simple (having one leaflet, like dandelion) or compound (having more than one leaflet, like clover). Veins within the leaf give a netted appearance in most cases.





Grass weeds — Identifying individual grasses is more difficult. All grasses are similar in appearance, especially when seed heads are not present. Leaves of grasses are not detached from the main stem. Leaves of grasses are narrow with a blade-like appearance. Leaves are produced one at a time in two vertical rows. Veins within leaves run parallel. Stems are usually round or flat.



Sedges — Sedges (like yellow nutsedge) are not grasses but have leaves that are similar in appearance and are thus often mistaken for grasses. Since herbicides used to control grass weeds are generally not effective on sedges, it is important to distinguish between the two types. Sedges have two key identifying characteristics: leaves arranged in three vertical rows and a triangular stem. Stems of grasses are commonly round or flat with leaves in two vertical rows.

Life Cycles:

Summer annuals — Annuals complete their life cycle within 12 months. Summer annuals generally germinate in the spring, grow or develop during the summer, produce seed and die by the fall or after the first hard frost.

Winter annuals — Winter annuals complete their life cycle in 12 months but generally overlap two calendar years. Winter annuals germinate in late summer to early fall and begin to develop. Winter annuals are dormant or semi-dormant through the winter, and flower the following spring. Winter annuals mature and die in late spring or early summer.

Summer and winter annuals reproduce and spread by prolific seed production, serving as a ready source of infestation and establishment when conditions are favorable.

Perennials — Perennials live for more than two years and may regenerate indefinitely. A simple perennial, like dandelion, may germinate from seed, but produces a tap root that, when severed, can produce a new plant. A complex perennial can spread by seed in addition to creeping above- or below-ground vegetative structures (such as stolons, rhizomes or nutlets) capable of initiating a new plant. Perennial weeds are often the most difficult to control. Usually you are trying to control an established plant that has already produced considerable vegetative reproductive structures that may require repeat control measures. Removal of the above-ground shoot growth does little towards long-term control. Long-term control usually requires herbicide treatments that act on the above- and below-ground structures.

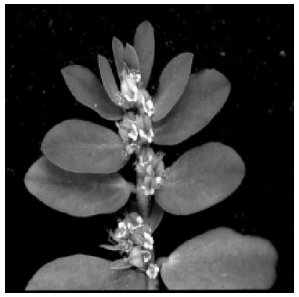
WEED IDENTIFICATION

Broadleaf Weeds

Summer Annuals



Prostrate knotweed[1]



Prostrate spurge[1]



Spotted spurge[1]



Common Groundsel

Winter Annuals



Henbit[1]



Deadnettle



Common chickweed[1]



Mouse-ear chickweed[1]
(can be perennial)



Carolina geranium
(can be perennial)

[1] Photo Credit to Arlyn W. Evans

Perennials



Wild onion/Wild garlic[1]



Dandelion



White clover



Hop clover



Ground ivy



Oxalis[1]



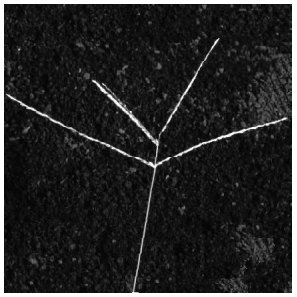
Wild strawberry



Wild violet

Grass Weeds

Summer Annuals



Large crabgrass[1]



Smooth crabgrass[1]



Goosegrass



Yellow foxtail[1]



Green foxtail[1]

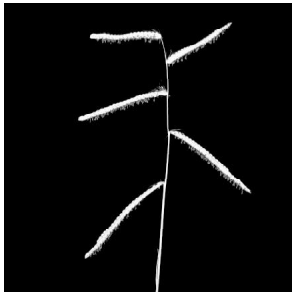
[1] Photo Credit to Arlyn W. Evans

Winter Annuals



Annual bluegrass

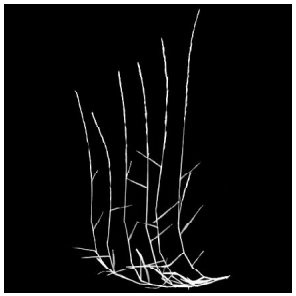
Perennials



Dallisgrass[1]



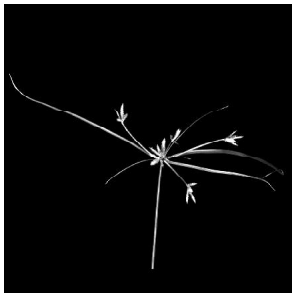
Bermudagrass



Nimblewill[1]

Sedges

Summer Annuals



Annual sedge[1]

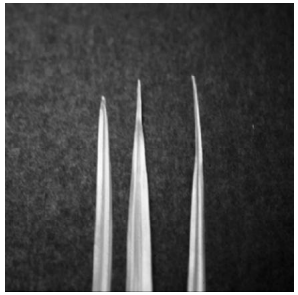
Perennials



Yellow nutsedge[2]



Purple nutsedge



Leaftips,
Far Left - Purple Nutsedge,
Two Right - Yellow Nutsedge

[1] Photo Credit to Arlyn W. Evans
[2] Photo Credit to Jimmy R. Summerlin

a UT Extension Reminder…

Common Weights and Measures

Length

Inch = 1/12 or 0.083 foot = 2.54 centimeters = 25.4 millimeters
Foot = 12 inches = 0.3048 meters = 30.48 centimeters
Yard = 36 inches = 3 feet = 0.9144 meters
Rod =16.5 feet = 5.5 yards = 5.03 meters
Furlong = 220 yards
Mile = 1,760 yards = 5,280 feet =1.61 kilometers = 8 furlongs = 80 chains

Area

Square inch = 0.007 square foot = 6.45 square centimeters
Square foot = 144 square inches = 929.03 square centimeters
Square yard = 9 square feet = 0.836 square meters
Square rod = 30.25 square yards
Acre = 4,840 square yards = 43,560 square feet = 160 square rods = 4,047 square meters = 0.405 hectare
Hectare =10,000 square meters = 2.47 acres
Square mile = 640 acres = 2.59 square kilometers = 1 section
Section =1 square mile = 640 acres = 2.59 square kilometers

Liquid Measures

Teaspoon = 0.1667 fluid ounce = 80 drops = 4.93 milliliters
Tablespoons = 3 teaspoons = 0.5 fluid ounce = 14.8 milliliters
Fluid ounce = 2 tablespoons = 29.58 milliliters
Cup = 8 fluid ounces =16 tablespoons = 236.6 milliliters
Pint = 2 cups =16 fluid ounces = 473.2 milliliters
Quart = 4 cups = 2 pints = 32 fluid ounces = 0.946 liters
Liter = 2.113 pints = 1,000 milliliters =1.057 quarts
Gallon = 4 quarts = 8 pints =128 fluid ounces = 3.785 liters
Cubic foot of water = 7.5 gallons = 62.4 pounds = 28.3 liters
Acre inch of water = 27,154 gallons = 3,630 cubic feet

Dry Measures

Teaspoon (level) = 0.35 cubic inch = 5.74 cubic centimeters
Tablespoon (level) = 1.05 cubic inch = 3 level teaspoons = 17.21 cubic centimeters
Cup = 16 level tablespoons 16.8 cubic inches = 275.3 cubic centimeters
Pint = 2 cups = 32 level tablespoons = 33.6 cubic inches = 550.6 cubic centimeters
Quart = 2 pints = 64 tablespoons = 67.2 cubic inches = 1.101 liters
Peck = 8 quarts =16 pints =538 cubic inches = 8.8 liters
Bushel = 4 pecks = 2,150 cubic inches = 32 quarts = 3 liters

Volumes

Cubic inch = 0.00058 cubic foot = 16.4 cubic centimeters
Cubic foot = 1,728 cubic inches = 0.037 cubic yard = 0.028 cubic meter
Cubic yard = 27 cubic feet = 0.765 cubic meters

Weights

Gram = 15.43 grains = 1,000 milligrams
Ounce = 28.35 grams = 437.5 grains
Pound = 16 ounces = 7,000 grains = 454 grams
Kilogram = 1,000 grams = 2.205 pounds
Ton (short) = 2,000 pounds = 0.907 metric tons

Visit the Agricultural Extension Service Web site at:
http://www.utextension.utk.edu/

PB1659-5M-10/00 E12-5215-00-007-01

The Agricultural Extension Service offers its programs to all eligible persons regardless of race, color, national origin, sex, age, disability, religion or veteran status and is an Equal Opportunity Employer.
COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS
The University of Tennessee Institute of Agriculture, U.S. Department of Agriculture, and county governments cooperating in furtherance of Acts of May 8 and June 30, 1914.
Agricultural Extension Service
Charles L. Norman, Dean