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CONTROLLING LAWN WEEDS WITH HERBICIDES

Home and Garden Bulletin No. 79

U.S. DEPARTMENT OF AGRICULTURE

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►Some of the lawn weeds that are most widespread or difficult to identify are illustrated on pages 7 to 15.

►Reaction of widespread lawn weeds to commonly used herbicides is given on page 16.

COMMON AND CHEMICAL NAMES OF HERBICIDES MENTIONED IN THIS BULLETIN

Common name	*Chemical name*
2,4-D	2,4-dichlorophenoxyacetic acid
2,4,5-T	2,4,5-trichlorophenoxyacetic acid
Silvex	2-(2,4,5-trichlorophenoxy) propionic acid
PMA	Phenylmercuric acetate
DMA	Disodium monomethylarsonate
Dalapon	2,2-dichloropropionic acid
SMDC	Sodium N-methyldithiocarbamate
DMTT	3,5-dimethyltetrahydro-1,3,5,2H-thiadiazine-2-thione
DCPA	Dimethyl 2,3,5,6-tetrachloroterephthalate
DMPA	0-(2,4-dichlorophenyl) O-methyl isopropyl phosphoramidothioate
Calcium arsenate	Tri-calcium arsenate
Methyl bromide	Methyl bromide
MCPA	2-methyl-4-chlorophenoxyacetic acid

PRECAUTIONS

Some herbicides are hazardous to man and animals. Use them only when needed and handle them with care. Follow the directions and heed all precautions on the labels.

Keep herbicides in closed, well-labeled containers in a dry place. Store them where they will not contaminate food or feed, and where children and pets cannot reach them.

Avoid spilling herbicide on your skin, and keep it out of your eyes, nose, and mouth. If you spill any on your skin, wash it off with soap and water.

Do not inhale herbicide dusts or mists.

Do not contaminate lakes, streams, or ponds with herbicide. Do not clean spraying equipment or dump excess spray material near such water.

Avoid drift of herbicide to nearby crops.

Dispose of empty herbicide containers at a sanitary land-fill dump, or bury them at least 18 inches deep in a level, isolated place where they will not contaminate water supplies. Wrap small containers in heavy layers of newspapers and place them in the trash can.

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CONTROLLING LAWN WEEDS WITH HERBICIDES

Information for this publication was furnished by the Crops Research Division, Agricultural Research Service

Herbicides are available for killing most of the weeds that infest lawns. If properly used, they do not damage desirable plants.

Don't depend solely on herbicides to keep your lawn free of weeds. Use them only when necessary, as part of your lawn-management program, which should also include mowing at the correct height, fertilizing, watering, disease and insect control, and other proven management practices.

Herbicides differ in ease of application and in effectiveness. They also differ in selectivity (for example, one herbicide may remove weeds without injuring the turf; another herbicide may temporarily, or even permanently, injure the turf).

BUYING HERBICIDES

Herbicides are sold in liquid, powder, and granular forms. Most of them have common names that are derived from their chemical names. The herbicides commonly used for lawn weed control are listed on page 2.

The plant-killing strength of 2,4-D, MCPA, and silvex may be stated on labels either as pounds-per-gallon acid equivalent or as percent of active ingredient. Methyl bromide, a gas, is 100 percent basic chemical. The plant-killing strength of the other herbicides listed on page 2 is stated on the label as percent of active ingredient.

Methyl bromide, SMDC, and DMTT are fumigants. Complete reseeding is required after their use.

TREATING INFESTATIONS

Following are recommendations for treating infestations of several of the most troublesome lawn weeds.

Weed Grasses

Crabgrass

The two types of crabgrass treatment are—

- Pre-emergence treatment—the herbicide is applied in the spring, before crabgrass germinates.
- Post-emergence treatment—the herbicide is applied after crabgrass emerges.

DCPA, calcium arsenate, and DMPA are pre-emergence herbicides. Apply them only on established lawns. Do not apply them on soil that is to be seeded or that has recently been seeded to lawn grasses.

Apply DCPA at 10 pounds per acre in March or April, before crabgrass germinates. It gives excellent control with little injury to established bluegrass, red fescue, and other common lawn grasses.

Apply calcium arsenate according to directions on the label. Turf

Herbicides are sold under various trade names but the active chemical ingredient is always included on the label.

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grasses may be slightly thinned and stunted by the treatment, but their appearance is acceptable if correct rates are applied. In subsequent years, reduced rates must be applied because the arsenic persists in the soil.

Apply DMPA at 15 to 20 pounds per acre early in the spring, before crabgrass has germinated. It gives excellent control with little injury to established bluegrass, red fescue, and other common lawn grasses.

DMA, other arsonate materials similar to DMA, and PMA give good post-emergence control of crabgrass. Make three applications of one of these herbicides at 7- to 10-day intervals. Make the first soon after the crabgrass emerges.

For putting greens, and in other areas where grass is cut short, use PMA at half the usual rate. Merion bluegrass is sometimes injured by PMA.

Apply herbicides according to instructions on container labels.

Do not overdose; overdoses add to the cost of treatment and may damage desirable plants.

For best results, apply herbicidal sprays only when—

- Temperature is between 70° and 85° F.
- Little or no wind is blowing.
- No rain is expected for several hours.

Note particularly precautions in using poisonous chemicals such as the arsenicals, PMA, and methyl bromide.

Wash face and hands thoroughly with soap (or detergent) and water after mixing or applying herbicides. Washing is especially important before eating or smoking.

Make sure the soil is moist before you apply DMA. In hot, dry weather, water the soil thoroughly a few days before and a few days after each application.

Do not treat St. Augustine grass with DMA. If you have fine-leaved fescue, treat with the lower rates recommended by the manufacturer, and only in early spring.

If broadleaf weeds are also present, you can control them by adding 2,4-D or silvex to the DMA or PMA solution in the first application. Prepare the 2,4-D or silvex at the rate recommended on the labels for broadleaf weed control. After the first application make full-strength applications of DMA or PMA at normal intervals.

Bermudagrass

Methyl bromide, dalapon, SMDC and DMTT kill bermudagrass. Lawns treated with any of these herbicides must be reseeded.

Methyl bromide is recommended because it requires only one application and because the treated area may be reseeded in 2 or 3 days. Follow-up applications are always necessary to complete eradication with dalapon, SMDC, or DMTT, and the homeowner must wait longer before reseeding his lawn.

Methyl bromide.—Methyl bromide is available in kits which contain equipment needed for its application. It should be applied when soil and air temperatures are above 65° F. When temperatures are as low as 50°, the application rate must be doubled.

The application consists of (1) covering the area to be treated with a gas-proof covering sealed to the ground with soil, (2) releasing the methyl bromide under the covering at the rate recommended by the manufacturer, and (3) removing the covering after a 24-hour waiting period.

This technique can also be used to kill existing turf so that you can

reseed an area without having to spade it.

> Methyl bromide is a deadly poison. Take care to prevent children and pets from being exposed to it. Never release methyl bromide in a closed room.

Dalapon.—Mix dalapon with water—8 tablespoons (¼ pound) of dalapon with each gallon of water. Apply 1 gallon of the mixture to each 1,000 square feet of lawn to be treated. Make one application in July, and another 3 to 4 weeks later to kill surviving plants. Reseed 3 weeks after the second application if temperatures have been high and the area has been kept moist. Otherwise wait 6 weeks before reseeding.

SMDC and DMTT.—In applying SMDC or DMTT, follow the manufacturer's directions. Make one application in early August and another 4 to 6 weeks later to kill surviving bermudagrass plants. Reseed 3 to 4 weeks after the second application.

Spot Infestations

To treat spot infestations of weed grasses, use dalapon or petroleum naphtha.

If you use dalapon, mix 8 tablespoons (¼ pound) of the herbicide in a gallon of water. Apply the solution to the weeds at the ground level with a cane-type applicator, syringe, or other suitable means. Take care to keep the herbicide off the lawn grasses.

If you use petroleum naphtha, apply a coarse spray of it—full strength—on the weeds. It is effective on all annual weeds.

Broadleaf Weeds

To control broadleaf weeds such as chickweed, henbit, knotweed, ground-ivy, and oxalis, use silvex alone or together with an equal amount of 2,4-D, both mixed half-strength. Prepare the herbicide solutions at the rates recommended by the manufacturers.

On lawns where bentgrass and clover are to be maintained, apply 2,4-D or MCPA at ¼ to ½ the rate recommended for lawn weed control. Silvex will kill white clover and dichondra. Dichondra is also sensitive to 2,4-D. If you have St. Augustine grass, ask your State agricultural experiment station for recommendations before using either of these herbicides on it.

Apply the herbicides in spring or fall. In most regions fall treatment is more satisfactory; lawn grasses fill in bare spots after fall treatment, but crabgrass is more likely to fill them in after spring treatment.

Unless broadleaf weeds are an acute problem on new lawns, do not apply herbicide until 4 to 6 weeks after grass seedlings emerge. If broadleaf weeds are an acute problem in new seedlings, 2,4-D and silvex, or MCPA may be used at one-fourth the rate normally recommended. After the second or third mowing, 2,4-D and silvex may be applied if needed, at the rate recommended by the manufacturer for perennial weeds.

To control wild onion or wild garlic, spray with a low volatile ester or an amine salt of 2,4-D.

Mix the herbicide you select according to the manufacturer's directions. Usually about twice as much 2,4-D is required to control wild onion or wild garlic as to control other broadleaf weeds. The 2,4-D is more effective if a small amount of household detergent is added to the solution.

Make the treatment every year in March or early April and in October or November until desired control is achieved.

When dandelions or other broadleaf weeds occur in scattered stands, apply the solution with a small sponge attached to the end of a stick, or with other applicators designed for spot treatments. If you use a sponge, wet it in the solution and press it against the base of each weed. Other plants touched with the sponge or applicator may be affected.

PREPLANTING TREATMENT

If you want to forestall weed infestations in new lawns, you can treat the soil in the prepared seedbed with methyl bromide.

Methyl bromide is a fumigant that kills weed seeds as well as established plants. The use of methyl bromide is discussed on page 5.

APPLYING SPRAYS

It is recommended that one sprayer be used for herbicides only. Choose a sprayer that can be adjusted to make a coarse spray at low pressure. On very small areas you may use a garden sprinkling can.

Even distribution of the spray on a small area is not difficult. When using a pressure sprayer on a large area, you can usually avoid leaving wide gaps or making overlaps by setting stakes or by placing objects on the ground and walking toward them while spraying. Or you can stretch guide strings across the lawn and follow them while spraying.

Keep the spray nozzles about 20 inches from the lawn surface. Point them down at the lawn so that spray hits only where desired.

CLEANING SPRAYERS

Clean your sprayer after each use.

Thorough washing with water and detergent is sufficient if the herbicide used was dalapon, PMA, DMA, SMDC, DMTT, DCPA, or DMPA. This cleaning method also is satisfactory after use of 2,4-D, 2,4,5-T, or silvex—if the sprayer will not be used later for spraying insecticide or fungicide on garden or ornamental plantings.

If the sprayer has contained 2,4-D, 2,4,5-T or silvex, and it may be used later for spraying fungicide or insecticide on desirable plants, clean it with activated charcoal or household ammonia. Activated charcoal is recommended because it cleans very rapidly, but household ammonia is satisfactory.

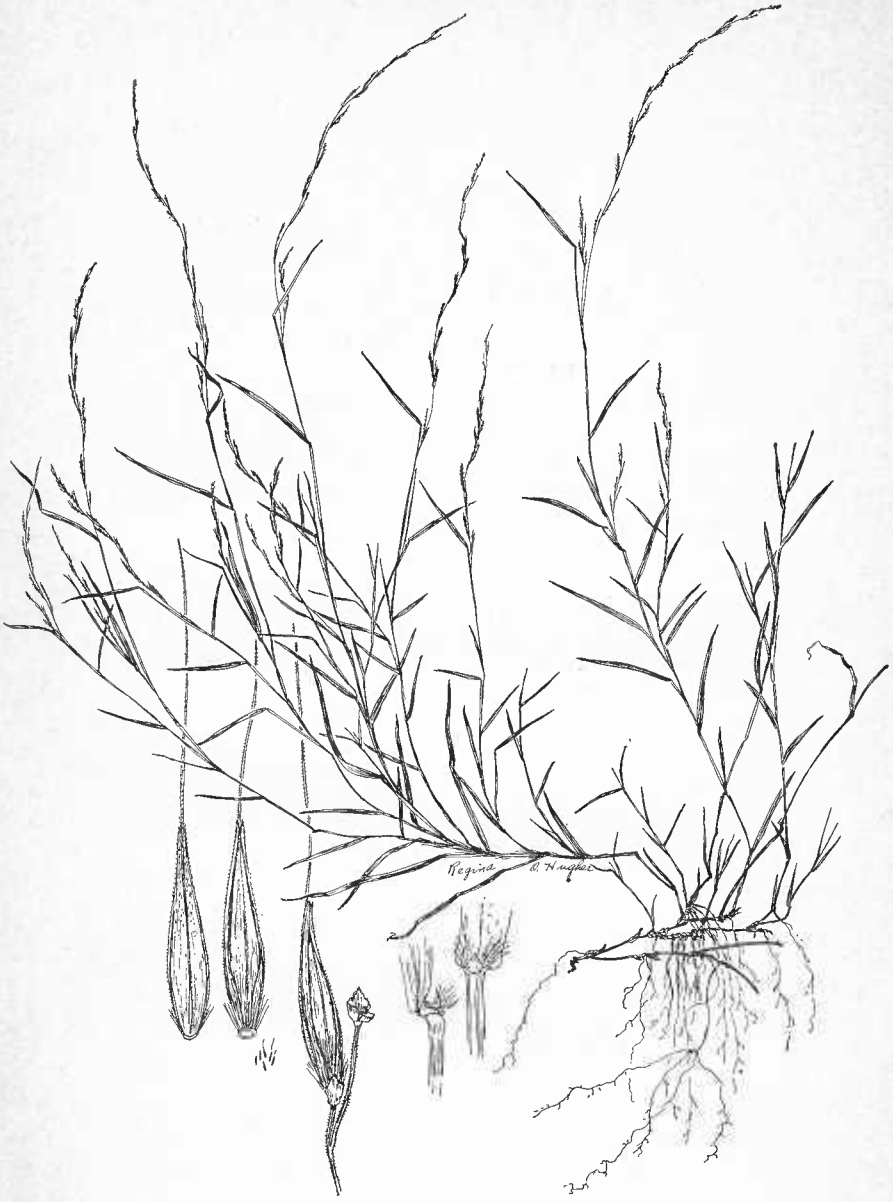
If you use activated charcoal, put 1 ounce of it, together with 1 to 2 ounces of household detergent, in 2½ gallons of water and agitate thoroughly. Operate the sprayer with this mixture in it for about 2 minutes and it will be clean.

If you use ammonia, make a solution of 2 tablespoons of ammonia in a quart of water. Fill the sprayer with the solution and spray a small amount through the nozzle. Let the rest of the solution stand in the sprayer overnight. Then pour out the solution and rinse the sprayer twice with clean water. Spray part of each rinse through the nozzle.

Minute quantities of herbicide may remain in spray equipment even after cleaning. Therefore, you may wish to have a sprayer for herbicides only, and another one for other chemicals.

FOLLOWING ARE ILLUSTRATIONS AND DESCRIPTIONS OF 10 LAWN WEEDS THAT ARE MOST WIDESPREAD OR DIFFICULT TO IDENTIFY

NIMBLEWILL



BN-12832-X

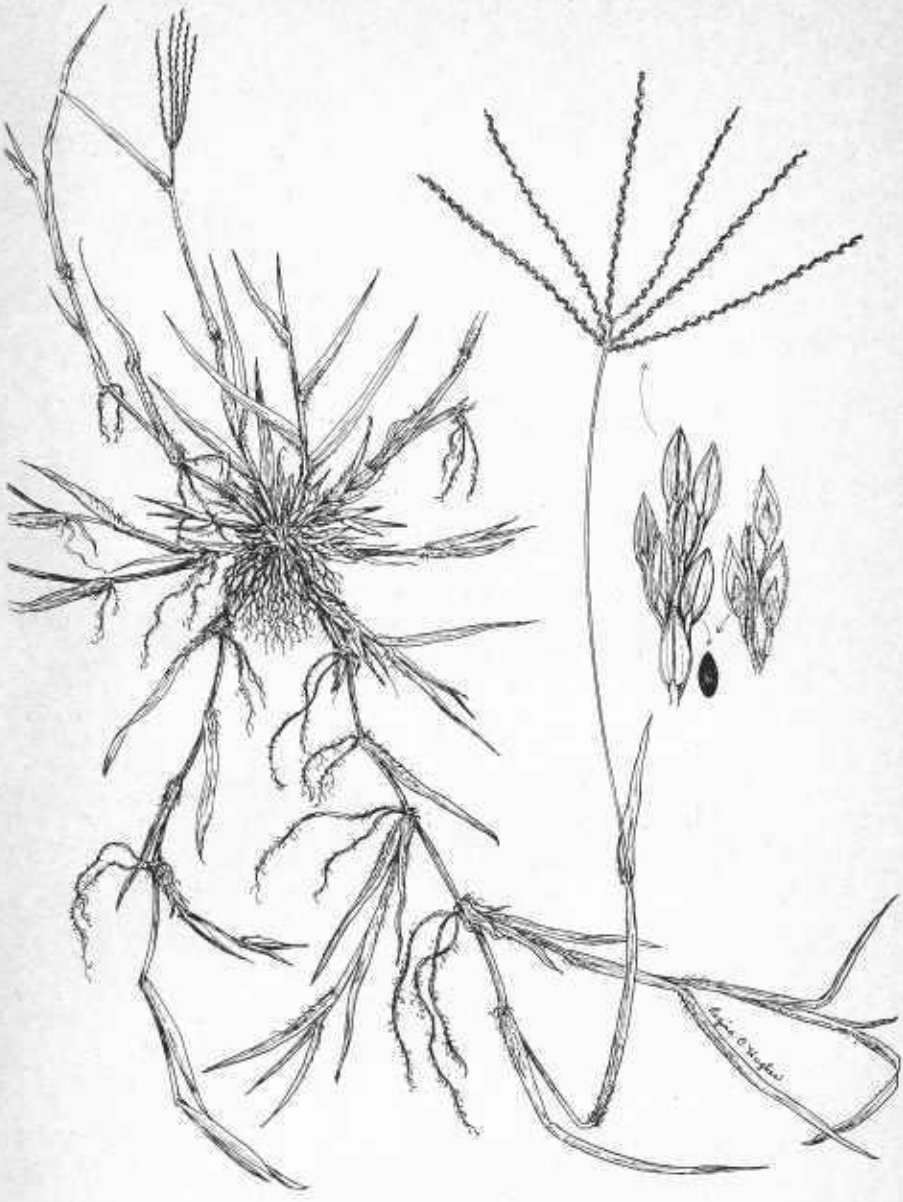
Nimblewill is a perennial that reproduces by seeds and by stems that root at the lower joints. Growth that develops from rooting stems will form dense patches 10 inches or more in diameter. The lower part of the stems are semiprostrate; upper parts curve upwards. The slender, branching stems are not hairy. Leaf blades are short and flat and without hairs. The stems that bear the seeds are branching and 2 to 6 inches long. Seeds are very fine, and borne singly.

SMOOTH CRABGRASS

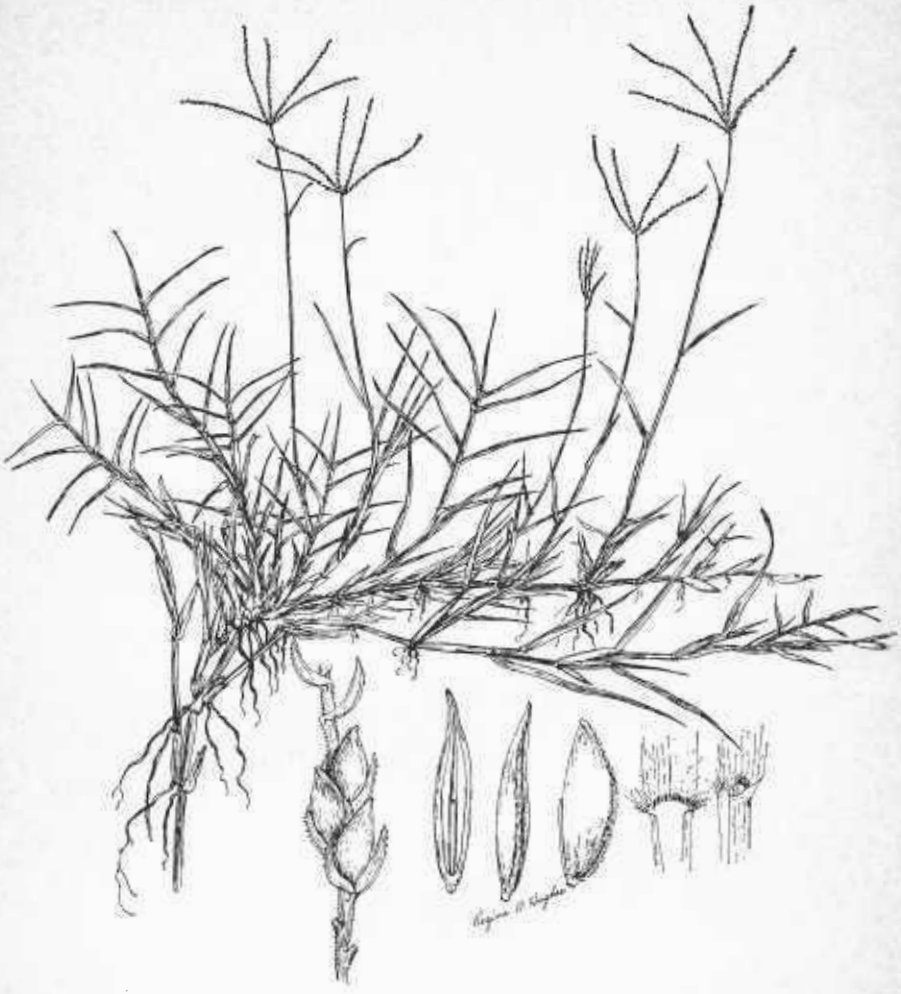
BN-12841-X, BN-12840-X

Crabgrass is an annual that reproduces by seeds. The stems are stout and vigorous; those that are prostrate root at the joints. Stems are not hairy. The leaf blade and the lower part of the leaf (sheath), which encloses the stem, are hairy on large crabgrass; leaves and sheaths on smooth crabgrass do not have hairs. Most leaf blades of large crabgrass are 1/4 to 1/3 inch wide. Smooth crabgrass is not as coarse and tall as large crabgrass. Seeds are borne on 3 to 10 branches that radiate from the top of upright stems. The two rows of seeds are on opposite sides of the branch.

LARGE CRABGRASS



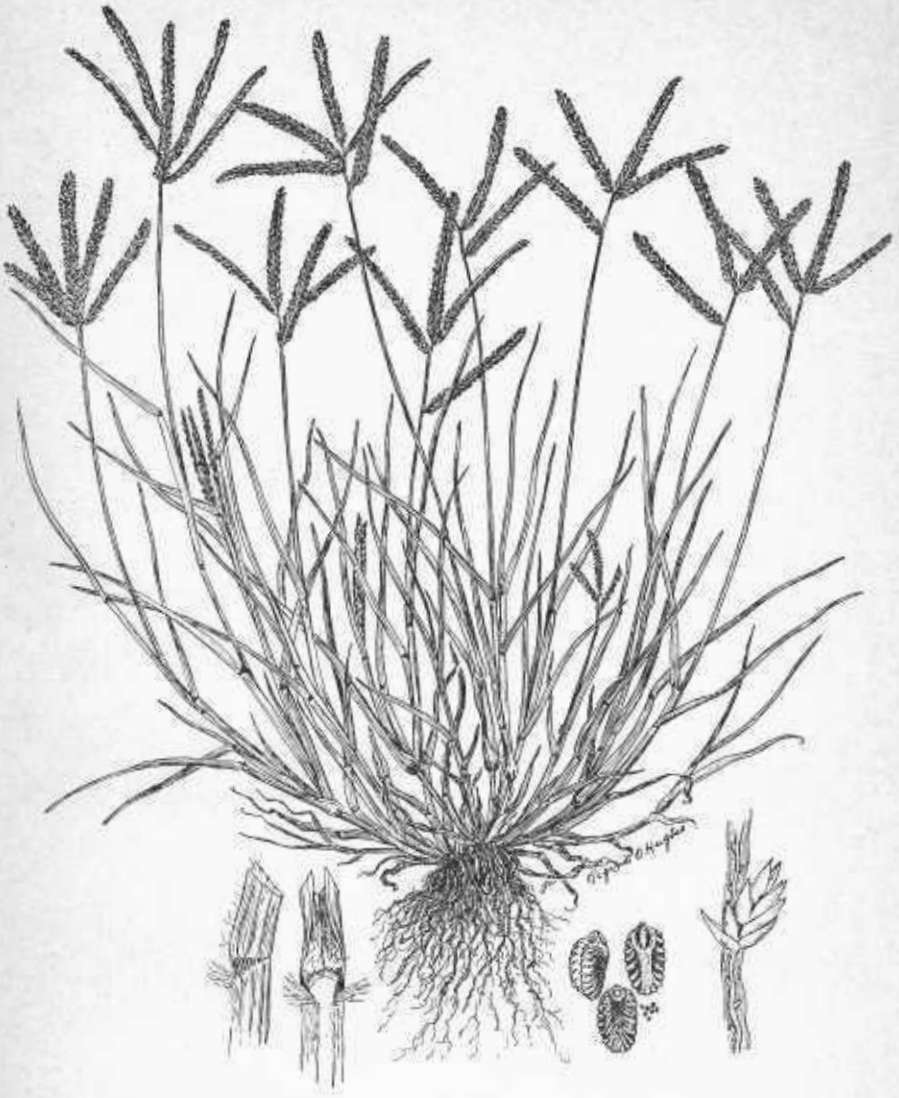
BERMUDAGRASS



BN-12839-X

Bermudagrass is an aggressive perennial grass that forms a dense, heavy sod. It reproduces by prostrate stems (both above and below ground) that root at the joints, and by seeds. Below-ground stems are hard, scaly, and sharp pointed. Above-ground stems are gray green and most of their surface is hairless. There are long hairs at the edges just above the junction of the sheath (the part of the leaf that encloses the stem) and leaf blade. Seeds are borne on three to five branches that radiate from the end of a flattened stem; the two rows of seeds on each branch are pressed closely against one side of the branch.

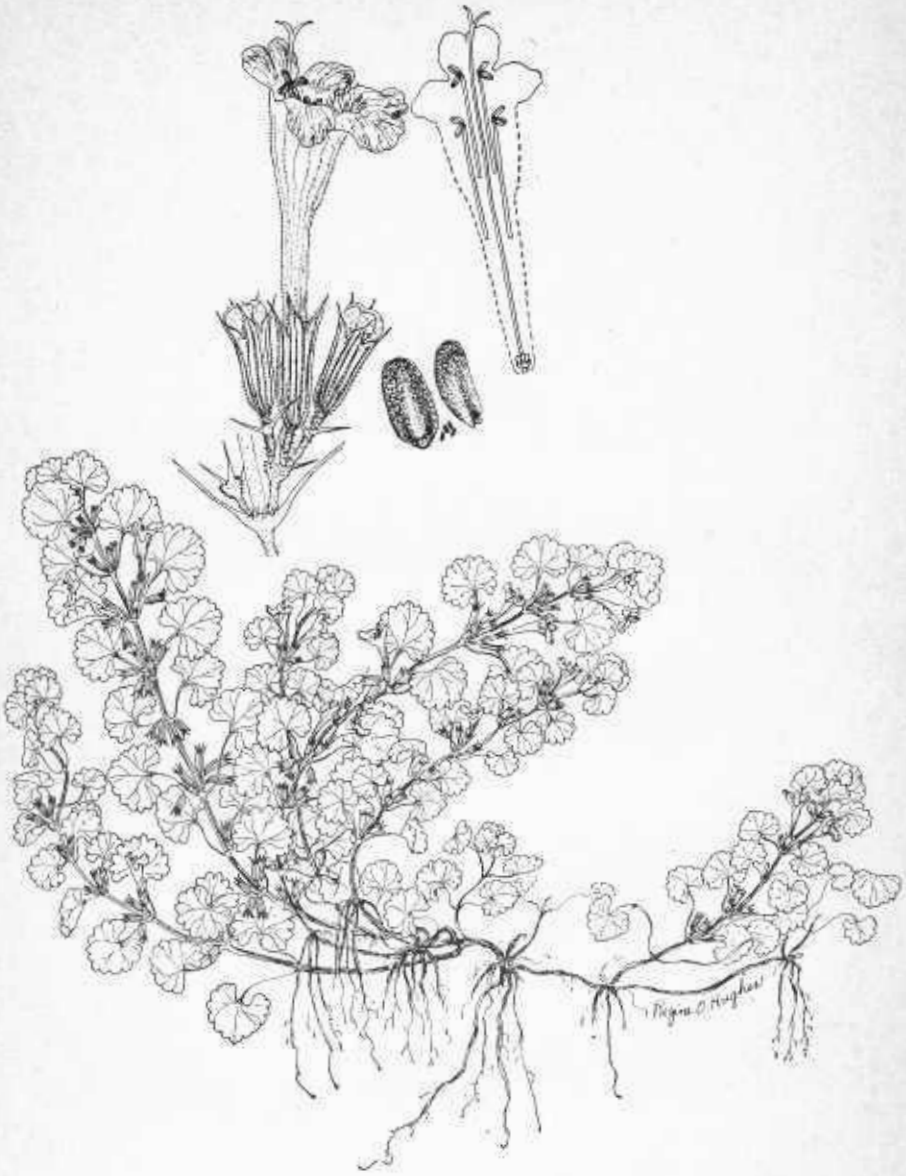
GOOSEGRASS



BN-12838-X

Goosegrass is an annual that reproduces by seeds. In general appearance, it has some resemblance to crabgrass. Stems are prostrate and without hairs, like those of smooth crabgrass. Crabgrass stems root at the joints; goosegrass stems do not. The pale-green leaf blades usually are without hairs and are 3 to 12 inches long; they may be folded. Seeds are borne on 2 to 10 branches that radiate from near the top of the stem. There are two rows of seeds, both of which are on one side of the branch.

GROUND-IVY



BN-12837-X

Ground-ivy, a perennial, reproduces by seeds and by creeping stems. Stems that are prostrate root at the joints; those that are upright give rise to long leaf stalks. Stems have four sides. The bright green leaves are almost round with round-toothed edges, and ½ to 1½ inches in diameter. Flowers are small, bluish purple, funnel-shaped, and borne in small clusters in the axils of the leaves.

HENBIT

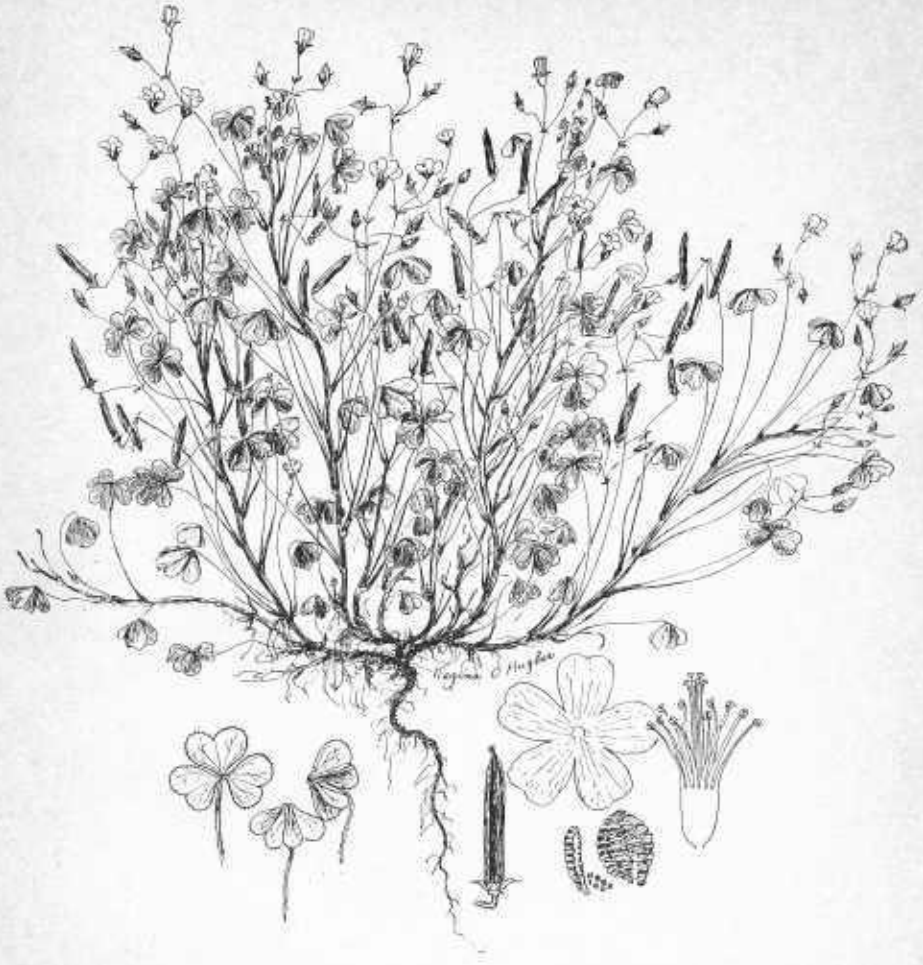
BN-12836-X

Henbit is a winter annual that reproduces by seeds and, occasionally, by rooting at the joints where stems touch the ground. Stems, 4 to 16 inches tall, are slender, not hairy, and four-sided. Leaves are opposite each other on the stems, and are hairy with rounded teeth. Lower leaves are borne on leaf stalks; upper leaves are attached directly to the stem and clasp the stem. Flowers are pinkish to purple.

COMMON CHICKWEED

MOUSE-EAR CHICKWEED

YELLOW WOODSORREL



BN-12833-X

Yellow woodsorrel is a perennial that reproduces by seeds. It is a low-growing plant, between 4 and 12 inches tall. The weak stems branch at the base and may root at the joints. Leaves are divided into three folded, heart-shaped leaflets that radiate from the end of a long, slender leaf stalk. Leaves are sour tasting. The yellow flowers have five petals and occur in clusters.

BN-12835-X, BN-12834-X

Common chickweed and mouse-ear chickweed are similar in habit of growth. Common chickweed is a low spreading plant, and mouse-ear chickweed is partly spreading to erect. Leaves on both plants are small, single, and opposite each other on the stems. Flowers on both are small; the petals are white and fine. But there are distinct differences: (1) Leaves of common chickweed are broadly oval, pointed at the tip, not hairy, and are borne on short leaf stalks; leaves of mouse-ear chickweed are very hairy, more elongated than round, and attached directly to the stem. (2) Flower petals are slightly notched on mouse-ear chickweed; flower petals are deeply notched on common chickweed. Common chickweed is an annual or winter annual that reproduces by seed and by creeping stems that root at the joints. Mouse-ear chickweed is a perennial that normally reproduces by seeds; occasionally it reproduces by root development on lower branches.

Effectiveness of herbicides for control of common lawn weeds

Weed	Type of plant	Control [1]			
		2,4-D	MCPA	2,4,5-T	Silvex
Bindweed, field (*Convolvulus arvensis*).	Perennial	Good	Good	Good	Good.
Buttercup, creeping (*Ranunculus repens*).	Perennial	Very good.	Excellent	Excellent	Excellent.
Chickweed, common (*Stellaria media*).	Annual	Good	Fair	Very good.	Excellent.
Chickweed, mouse-ear (*Cerastium vulgatum*).	Perennial	Good	Fair	Very good.	Excellent.
Cinquefoil, Canada (*Potentilla canadensis*).	Perennial	Very good.	Good	Good	Good.
Cinquefoil, sulphur (*Potentilla recta*).	Perennial	Very good.	Good	Very good.	Good.
Dandelion (*Taraxacum officinale*).	Perennial	Excellent	Excellent	Excellent	Excellent.
Dock, curly (*Rumex crispus*).	Perennial	Very good.	Good	Very good.	Fair.
Garlic, wild (*Allium vineale*)	Perennial	Good	Fair	Fair	Poor.
Goosegrass (*Eleusine indica*).	Annual	Poor	Poor	Poor	Poor.
Ground-ivy (*Glecoma hederacea*).	Perennial	Good	Fair	Good	Very good.
Henbit (*Lamium amplexicaule*).	Annual	Fair	Fair	Good	Very good.
Ivy, English (*Hedera helix*)	Perennial			Excellent	
Knawel, annual (*Scleranthus annuus*).	Annual	Poor	Poor		Good.
Knotweed (*Polygonum aviculare*).	Annual	Good	Fair	Good	Good.
Medic, black (*Medicago lupulina*).	Annual	Good	Good	Good	Very good.
Moneywort (*Lysimachia nummularia*).	Perennial	Excellent			
Nutgrass, purple (*Cyperus rotundus*).	Perennial	Fair	Poor	Poor	Poor.
Nutgrass, yellow (*Cyperus esculentus*).	Perennial	Fair	Poor	Poor	Poor.
Pennywort, lawn (*Hydrocotyle rotundifolia*).	Perennial	Very good.		Excellent	Excellent.
Plantain, broadleaf (*Plantago major*).	Perennial	Excellent	Excellent	Excellent	Very good.
Plantain, buckhorn (*Plantago lanceolata*).	Perennial	Excellent	Very good.	Excellent	Very good.
Plantain, rugel (*Plantago rugelii*).	Perennial	Excellent	Excellent	Excellent	Very good.
Poison-ivy (*Rhus radicans*)	Woody	Good	Good	Excellent	Excellent.
Poison-oak (*Rhus diversiloba*).	Woody	Good	Fair	Excellent	Excellent.
Puncturevine (*Tribulus terrestris*).	Annual	Very good.	Fair	Good	
Sorrel, red (*Rumex acetosella*).	Perennial	Poor	Poor	Poor	Fair.
Speedwell, corn (*Veronica arvensis*).	Annual	Fair	Poor	Poor	Fair.
Speedwell purslane (*Veronica peregrina*).	Annual	Good	Poor	Good	
Spurge, spotted (*Euphorbia maculata*).	Annual	Fair		Fair	Good.
Strawberry, wild (*Fragaria*)	Perennial	Fair	Poor	Fair	Good.
Thistle, Canada (*Cirsium arvense*).	Perennial	Good	Good	Good	Good.
Violet (*Viola*)	Perennial	Fair	Poor		Good.
Woodsorrel, yellow (*Oxalis stricta*).	Perennial	Fair	Poor		Very good.

[1] Omission of a term indicates effectiveness is not known.

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