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Weed Control in Lawns and Gardens

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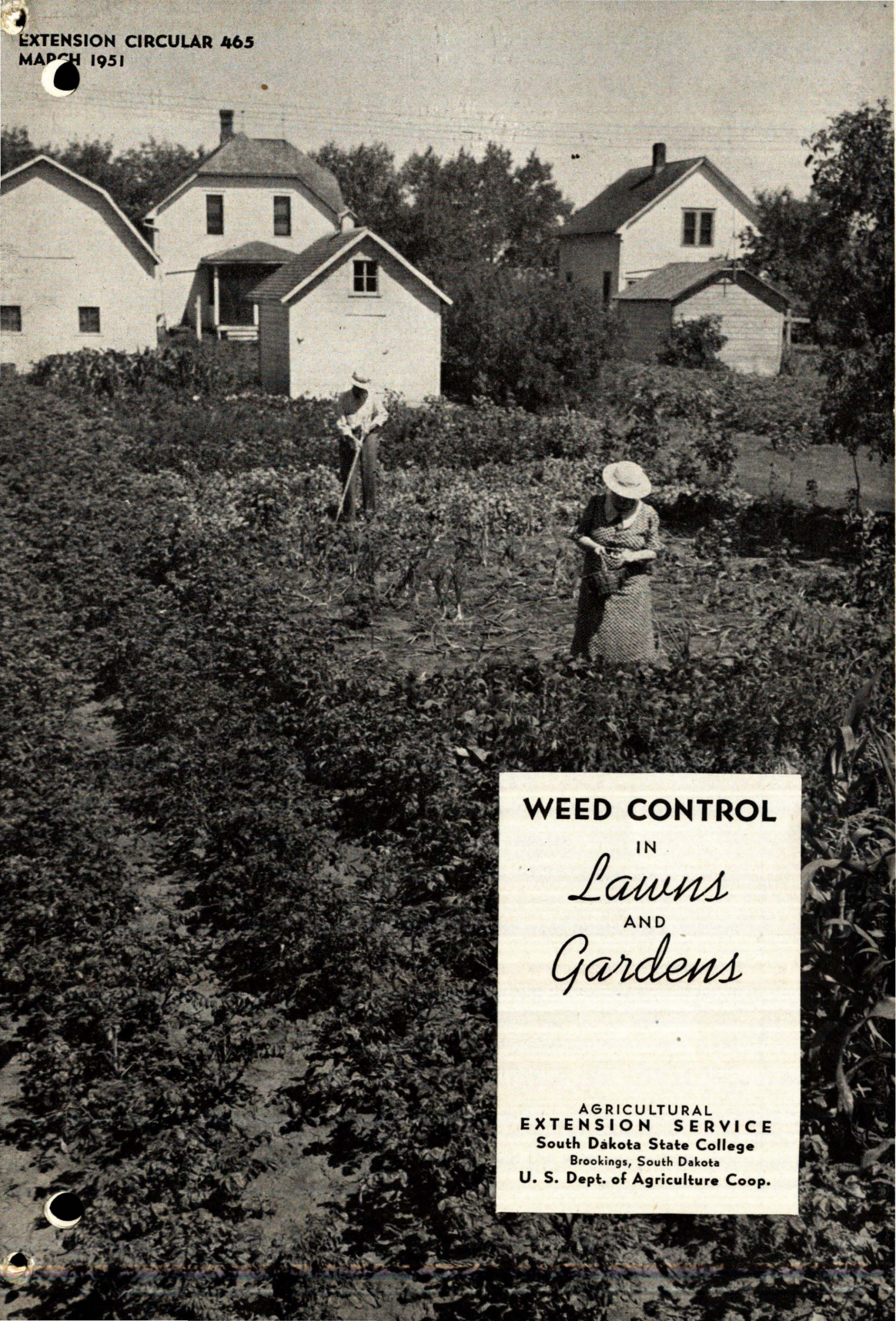

WEED CONTROL IN *Lawns* AND *Gardens*

AGRICULTURAL
EXTENSION SERVICE
South Dakota State College
Brookings, South Dakota
U. S. Dept. of Agriculture Coop.

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Precautions

If applied too heavily, most of the weed-killing chemicals will harm the grass and garden crops, in addition to the weeds.

Vapors from standard ester formulations of 2,4-D and 2,4,5-T may be carried a considerable distance by air movements. Watch wind direction and velocity so you do not damage sensitive trees, flower beds, hedges or garden crops.

Do not use the same sprayer for weed-killing chemicals and insecticides or fungicides **until** it has been cleaned thoroughly. It's best to clean the sprayer immediately after each use. Household ammonia is a good cleaning agent; soap and warm water will do fairly well—don't forget the hoses and nozzles.

Read the information on the container. It will give directions and precautions for using and the weeds for which the solution is intended.

If you live in Town, Here's what you can do . . .

Wherever weeds grow, they are a **group problem.** Since 1945, the people of South Dakota, through legislative action, have developed an effective weed control program, based on group participation. This program is set up to help achieve weed-free farms and weed-free towns.

As a resident of one of South Dakota's towns or cities, your participation in this program is important—just as essential as that of the farmers, railroads, highway department and other public officials concerned with weeds. We all have the same problem. We must work together. Weeds must be killed!

Many urban civic groups already have tackled the problem with success. As a result of their efforts, their communities are a safer, healthier and more beautiful place in which to live; and their gardens are more productive.

Weeds are a challenge to better living. **You** can meet this challenge by getting your organization to spearhead the drive against these costly pests. It is a worthy project for garden clubs, Boy Scouts, 4-H clubs, chambers of commerce, veteran's organizations, or almost any civic-minded group that wishes to cooperate with the state weed control program. Merely discussing the problem will not do the job—it will take action.

This circular is intended, primarily, to encourage and aid weed control projects in cities and towns. Discuss the problem at your meetings. Then act!

Ask help from your newspaper editor, your county agent, your high school ag instructors and other enthusiastic weed fighters. Get the cooperation of every citizen in the community. Then, plan to kill weeds in every vacant lot, alley, roadside and "dead-beat border" in town. You won't get them all in a single year. But don't give up!

You can't argue with weeds; they must be killed.

Weed Control in Lawns & Gardens

By Leonard L. Schrader[1] and Solomon Cook[2]

Introduction

Weeds are a problem in the city, small town and around the farm home, just as they are a problem in pastures, hay lands and tilled fields. Wherever weeds grow, they are an unsightly and expensive nuisance.

In the vacant or untended lots in town, weeds become the source of seed that will spread to surrounding gardens, lawns and farm fields. Hampered vision at intersections, caused by rank-growing weeds, has contributed to many traffic accidents. In addition, they sap the soil's fertility, which probably is sent up in smoke when the weeds are burned in the fall. In gardens, they reduce crops yields and increase costs of production.

The alternative for weeds in that vacant lot is a well-kept turf of good lawn grass or alfalfa. If maintained properly, the area will not be a source of weed seed; it will not cause traffic accidents; it will not aggravate persons affected by hay-fever; and the soil's fertility will not be drained—actually, the soil will improve. If seeded to alfalfa, some person who can use the hay usually will agree to keep it cut.

Garden clubs and other civic-improvement organizations in many South Dakota towns have taken it upon themselves to clean up the unsightly and ugly weeds in their communities. As a result of their efforts, ugly weeds in vacant lots, streets, alleys and playgrounds are becoming fewer, year-by-year.

This bulletin is prepared, as a part of South Dakota's weed control program, to help these groups and other interested individuals in their commendable efforts. The Extension Service of South Dakota State College and the State Weed Board believe that weed control in cities and towns should go hand-in-hand with the weed control activities of South Dakota farmers, landowners, railroads and public lands.

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References: Exp. Sta. Circ. 69 (Rev.)—Chemical Control of Weeds in S. Dak.
SWB 5—South Dakota Weeds
Exp. Sta. Circ. 75—Cultural Methods of Noxious Weed Control in S. D.
Ext. Circ. 454—South Dakota's Noxious Weeds.

Caring For A Lawn

Weeds particularly troublesome to lawns are: crab grass, dandelion, plantain, low mallow, chickweed, kochia and knotweed. Different methods of killing these weeds have been employed with varied success.

General care of the lawn is important in controlling weeds. Proper mowing, rolling, fertilizing, and watering contribute to the vigorous growth of the grass which, in turn, helps to crowd out the weeds. Lawns can rarely be kept free of weeds because recontamination comes from a number of sources. The most common sources are: impure seed mixtures, weedy top soil or weed-infested manure, wind-blown seeds, and birds. Many persons spend hours digging and pulling their weeds, while others are beginning to use commercial weed killers more extensively.

Lawn Management Practices

Where weeds persist in lawns, it is quite evident that conditions are more suitable for them than the grass. Methods that stimulate the grass so it becomes so vigorous and thrifty that weeds cannot compete or survive are considered good lawn management practices.

Fertilization

Nitrogen fertilizers aid in forming a strong, dense turf which prevents weeds from becoming established. Phosphate fertilizers are less desirable for lawns since they stimulate the weeds rather than the grass. Completely decomposed farm manure is considered a desirable fertilizer for furnishing nitrogen. Complete decomposition of the manure prior to application destroys the viability of the weed seeds. Application of the manure should be made in the late fall months or very early spring.

Commercial nitrate fertilizers also are commonly used. The two main kinds are ammonium nitrate and ammonium sulphate. It is important to follow directions for applying such fertilizers because an over-application may burn the grass. Application preferably should be made in early spring. Use of a mechanical spreader will help spread it evenly.

Mowing

Close mowing often exposes the soil so weed seedlings may become established. Frequent close mowings also reduce the vigor of the grass. In order to maintain a dense growth of grass, allow it to make a good growth early in the spring, and late in the growing season. Clip the grass at about 2 inches so as to leave a dense growth of grass shoots which can produce food to keep the grass in a thrifty condition. Do not mow the grass during periods of drought and hot weather.

Watering

During hot and droughty weather, the lawns may require frequent artificial watering. Thorough waterings —so the ground is well soaked—several days apart are more desirable than light applications. The grass roots are found closer to the soil surface when light applications of water are made. The grass then will tend to dry out and burn during hot, droughty periods. When this happens, weed seeds will sprout and become established because the grass doesn't offer sufficient competition.

General Weed Control Methods

Lawns badly infested with weeds, should be turned under, the soil cultivated, packed and reseeded to a good grass mixture. Isolated plants or small patches of weeds should be dug out, the roots and shoots destroyed. Bare spots should be reseeded to grass.

Many people spend hours digging and pulling weeds out of the lawn. The results usually are discouraging, as new weed shoots soon reappear, the grass roots are disturbed, and bare spots appear in the place where the weeds were removed. In digging dandelions, many fail to dig deep enough to get all the roots.

Crab grass and chickweed may be controlled by hand weeding or spading of the infested areas and then reseeding to a good lawn grass. The best time to spray 2,4-D on chickweed is during the budding stage, which will give fairly good control. Raking also is effective. The weeds should be raked when they are recognized and before they scatter seeds. The grass turf is not so easily disturbed at this time either.

Weeds with deep tap roots or tough fibrous roots should be hand pulled in the early spring when the soil is loose and wet.

Chemicals

Many chemicals have been used on lawns, but only a few provide good results. It has been difficult to recommend a chemical that will not injure the lawn grass or susceptible plants bordering the lawn. Research workers are finding new chemicals that are recommended for controlling many troublesome lawn weeds.

2,4-D:

Pure 2,4-D is not soluble in water. It is made soluble by treating it with other chemicals. The main formulations are classified as esters, amines, and sodium salts. The ester formulations are more injurious to plants than the amine or sodium salt formulations. There also is more chance of injury to susceptible plants from fumes and spray drift when ester formulations are used.

2,4-D will give satisfactory control of dandelions, plantain, kochia and low mallow when applied in the spring when the weeds are small and before they blossom.

New seedings of lawns should not be treated with 2,4-D until after the grass is well stooled. Care should be taken so that not more than ¼ to½ pound of 2,4-D acid per acre is applied. Old stands of grass sods also may be injured from high rates of application. Injury noticed will be burnt or fired areas.

The fumes arising from plants sprayed with standard 2,4-D will often injure plants that are susceptible. If it is necessary to spray 2,4-D near susceptible plants, low volatile formulations are safer to use. These formulations do not produce any damaging fumes. However, care should still be taken not to allow any spray drift to come in contact with such plants. 2,4-D is very difficult to remove from spraying equipment. If the sprayer is to be used later for the application of fungicides or insecticides, extreme care should be taken to clean the sprayer thoroughly.

Other chemicals used with fair results are iron sulfate, ammonium sulphate, sodium chlorate, kerosene, and sinox. These chemicals, unless used

very carefully, cause injury to the grass as well as the weeds and are quite difficult to handle.

Weeds Troublesome To Vacant Lots and Gardens

Vacant lots and gardens are often considered to be serious sources of weed infestations, because they are easily neglected by the owners. However, the picture has changed greatly in recent years because people are becoming more conscious of weeds and they realize the seriousness of allowing their further spread. Where such areas have been taken care of, the establishment of grass has reduced the number of many plants to which hay fever victims and others are allergic. Only people who have suffered from hay fever can appreciate the killing of such weeds as ragweed, kochia, and marsh elder.

Identification and Control Of Individual Weeds

Dandelion

(See illustration page 13)

Perennial. Reproduces by seed. Strong, fleshy taproot. Leaves 3 to 10 inches long, irregular margins. Flowers yellow, showy, compact, 1 to 2 inches in diameter. Seeds attached to fluffy parachutes and carried easily by the wind. **Control**—Seed prevention. 2,4-D. Mow grass at least 2½ inches high.

Chickweed

(See illustration page 14)

Annual or winter annual. Reproduces by seeds and creeping stems, which root at the nodes. Leaves opposite, fleshy, heart-shaped, smooth and bright green. Flowers star-shaped and white. Seed, small, reddish-brown, flat, rough, produced in a capsule. **Control**—Hoeing, raking, hand pulling, 2,4-D.

Crabgrass

(See illustration page 15)

Annual. Reproduces by seeds and creeping stems, which root at the nodes. Leaves 2 to 6 inches long. Seeds, yellow, produced on long, narrow spikes, branching out like fingers. Plant turns purple during cool weather. **Control**—Prevent seed production. Hand pulling, cultivation. Encourage lawn grass to grow by applying nitrogen fertilizer.

Kochia (Fireweed)

(See illustration page 16)

Annual. Reproduces by seed. Bushy. Seeds develop even though plant is closely mowed. Plants grow up to 7 feet high. Turns from a dark green to brownish red as it matures. Leaves, hairy, alternate, 1 to 2 inches long. Flowers, small, green, produced in small heads at base of leaves. Seeds dull, rough, flat, triangular, and grayish-black in color. Important hay fever weed. **Control**—Prevent seed production. Keep ground stirred. 2,4-D.

Ragweed

(See illustration page 17)

Annual. Reproduces by seed. Bushy, pale green. Important hay fever weed. Flowers small green in drooping heads. Seeds, egg-shaped, straw colored, ridged with short hooks. Plants grow 1—4 feet high. **Control**—Pre-

vent seed production. 2,4-D, mow, cultivate.

Marsh Elder

(See illustration page 18)

Annual. Reproduces by seed. Grows 3 to 8 feet high. Stem stout, woody, smooth. Leaves large, opposite. Flowers small green. An important hay fever weed. Seeds, dark-gray or black, triangular, somewhat flattened. **Control**—Prevent seed production by mowing, pulling, 2,4-D.

Foxtail (Pigeon Grass)

(See illustration page 19)

There are three common foxtails, namely green, yellow and bristly. Their growth habits are similar. The heads of bristly foxtail have hooks on the tip of each bristle which enables the head to stick to clothing, hair, fur or wool of animals. They are annuals, reproducing by seeds and growing mainly in cultivated soil. **Control**—Prevent seed production by hoeing and pulling.

Purslane

(See illustration page 20)

Annual. Reproduces by seed. Grows flat on the ground. Stems 4 to 12 inches long, fleshy, reddish. Leaves alternate, fleshy, with rounded tips. Flowers small yellow. Seeds tiny, black, shiny, flat, produced in small pods. **Control**—Hoe or pull out the plants when they are small.

Rough Pigweed

(See illustration page 21)

Annual, reproducing by seed. Grows 1 to 6 feet high. Stem woody, and branched. Leaves rough with prominent veins and ribs. Seed small, black, shiny and produced in bristly heads. The root is fleshy and reddish. **Control**—Spray with 2,4-D, prevent seed production by hoeing and pulling.

Ground Ivy

(See illustration page 22)

Perennial, reproducing by seed and creeping stems which root at the nodes. Leaves round with indented margins, bright green, ½ to 1½ inches in diameter. Flowers purple, funnel-shaped, clustered in small groups. **Control**—Hand weed frequently, cultivate, 2,4-D.

Low Mallow

(See illustration page 23)

Annual or short lived perennial, reproducing by seeds. Stems round smooth, growing mostly prostrate. Leaves bright green, nearly round, with toothed margins, 1 to 3 inches in diameter. Flowers small, pale blue or lavender, bell-shaped. Seed produced in round flat pods, resemble buttons. **Control**—Cultivate, hand weed, 2,4-D.

Major Plantain

(See illustration page 24)

Perennial, reproducing by seed. Leaves originate from the crown on long stems, are oval, 1 to 8 inches long, smooth, bright green. Flowers and seeds produced in long, round, compact, erect spikes. **Control**—Hoe or spade infested areas. 2,4-D.

Shepherd's Purse

(See illustration page 25)

Annual or winter annual. Reproduces by seeds. Grows 6 to 20 inches high. Lower leaves form a ring of flat leaves, with irregular margins, on the ground. Upper leaves narrow, smooth with base extending around the stem. Flowers white, small. Pods flat, triangular or heart-shaped. **Control**—Plow or cultivate infested areas, pull or hoe scattered plants. 2,4-D.

Knotweed

(See illustration page 26)

Annual, reproducing by seed. Withstands heavy trampling. Grows flat on the ground. Stems leafy, wiry, 4 inches to 2 feet long. Each joint on the stem covered with a thin papery scale. Erect knotweed grows erect 8 to 24 inches in height. Plants often covered with a white mildew. Flowers small, yellow or white. **Control**—Spade up or pull infested areas and reseed to grass.

Wild Lettuce

(See illustration page 27)

Annual or winter annual, reproducing by seed. Grows 2 to 7 feet high. Stems stout, leafy, scattered spines. Leaves alternate, irregular or toothed margins, spines on underside of middle vein and along margin. Flowers yellow. White bristles produced on ends of each seed allow it to be carried by the wind. **Control**—Prevent seed production by mowing, plowing, 2,4-D.

Chemical Weed Control in Vegetable Crops

The cost of weeding many vegetable crops can be reduced greatly by using chemicals wisely. Weed control with chemicals must not be considered as a substitute for cultivation but rather as a supplement to standard practices. In other words we will need to do some hand weeding and some cultivation, but, not so often.

It is unfortunate that no one chemical can be used to weed all vegetables. Therefore, it is most important to use the proper material for the crop concerned. Soil, weather and crop conditions greatly influence the usefulness and effectiveness of these chemicals. There is much more to be learned about controlling weeds with these various chemicals.

Chemical weed control methods have proved satisfactory for the following crops: asparagus, beans, beets, carrots, celery, dill, parsnips, parsley, onions, peas, potatoes and sweet corn. The methods listed and described on the following pages are considered the most promising in the North Central and Plains areas.

The rates of of application listed for 2,4-D and TCA refer to pounds of acid equivalent per acre. Where a range in the rate of application of 2,4-D is given, the lower rate applies to the esters and the higher rate to the amine or sodium salt formulations. All rates are based on over-all coverage. If we treat only a narrow strip over the row, the application should be reduced accordingly. Herbicide treatments suggested should be used only once during the season.

* * *

Peas

Dinitro sprays have given excellent control of wild mustard. The peas should be from 4 to 8 inches tall when sprayed and must not be wet with dew or rain.

Beets

Where annual grasses are a problem, TCA at 8 to 10 pounds per acre applied at least 2 days before any beets have emerged, is recommended.

Asparagus

Where broadleafed weeds are more troublesome than grasses, 2,4-D has been used with success as a selective herbicide. **Recommendation:** Apply 2,4-D at 1 to 2 pounds per acre on established beds before the cutting season in the spring (following disking) or immediately following the last cutting.

Little injury will be noticed on the spears, if 2,4-D is applied before asparagus spears come to the surface in the spring. Twisting or curling may result when 2,4-D is applied directly on the spears. When the crop has "leafed out" apply the spray directly at the base of the stalks.

Beans

A residual pre-emergence application of 6 to 8 pounds per acre of dinitrophenols will control most annual weeds in beans. The treatment should be applied within 2 days after planting snap beans and within 5 days after planting lima beans.

Carrots, Celery Dill, Parsnips and Parsley

Stoddard Solvent applied, undiluted, on the crop in the field at 80 to 100 gallons per acre gives good control of annual weeds in these crops. Apply as soon as most weeds have emerged, but before any are over 2 inches high. Do not spray carrots or parsnips after the tap root is more than ¼ inch in diameter. Later applications may result in an oily flavor of the product. Celery should be sprayed only in the seedbed. Do not spray during very hot, dry, windy days.

Onions

To control weeds that have emerged before the onions, use Stoddard Solvent at 40 to 80 gallons per acre as a pre-emergence spray. 2,4-D used as a pre-emergence spray has been effective in some areas.

Post-emergence sprays of 2 to 3 percent of sulfuric acid at 100 gallons per acre, applied when the onions have at least one true leaf, will control many small annual weeds. Purslane is controlled only in the cotyledon stage. Lamb's quarters and grasses are usually not killed.

Potatoes

While mechanical pre-emergence weed control is preferred, chemical sprays during wet weather may be desirable. 2,4-D at 1 to 2 pounds, dinitrophenols at 6 to 8 pounds and pentachlorophenol at 15 to 20 pounds per

Applying Chemicals on Small Areas

In this circular, rates of applying chemicals are given on the basis of "so much **pure chemical per acre.**" If smaller areas are to be sprayed, it will be necessary to determine the proper rate in smaller measurements. (43,560 sq. ft. equal 1 acre; 4,840 sq. yds. equal 1 acre.)

When buying the chemicals, it is important to notice the percentage of pure acid in the solution. The rates given in this circular apply to the **pure, undiluated acid.**

In all cases, it is safe to follow the directions on the container! They will give specific instructions for mixing and applying on small areas.

acre have all given good results as pre-emergence treatment.

Post-emergence sprays with 2,4-D is not recommended, even though potatoes are known to be highly tolerant to 2,4-D. It is known to alter the growth of tops and tubers and may even effect the color of tubers.

Sweet Corn

Spraying with 2,4-D can be used to reduce the number of cultivations needed and to control some weeds in the row or hill. It should not be expected to replace cultivation. Cultivation is needed regardless of weeds on some soil types.

Pre-emergence — pre - emergence treatments with 2,4-D will control annual grasses and some broad-leaved weeds, such as purslane which are not controlled in sprays. On loam soils and those of finer texture, pre-emergence use of 2,4-D is satisfactory if applied 5 to 7 days after planting, at rates of 1 to 2 pounds per acre.

Isopropyl and butyl ester formulations are less hazardous to the corn than amine or sodium salt formulations. Dry weather after pre-emergence treatments may make them ineffective and excessive rain may create a hazard to corn. Pre-emergence spraying is not recommended on sandy soils.

Pre-emergence treatments of dinitro-phenols at 6 to 8 pounds or pentachlorophenol at 15 to 20 pounds per acre also can be used.

Post-emergence—very early post-emergence treatments at 1 to 2 pounds of 2,4-D per acre may be superior to strictly pre-emergence spraying. Spraying should be done as early as possible to control weeds.

If spraying is necessary and the corn is large enough, apply the spray under the top leaves by means of dropped nozzles unless the weeds are taller than the corn. The spray must reach the top of the weeds to be most effective. A rate of ¼ to ½ pound per acre is satisfactory.

Some injury is to be expected at any time. Brittleness and bending is most serious. High temperatures at time of treatment increase corn injury.

Precautions: Do not spray 2,4-D near plants (such as tomatoes and lettuce) that are subject to injury. Extreme caution must be used to prevent the material from drifting. Do not spray on hot, dry, windy days.

Strawberries

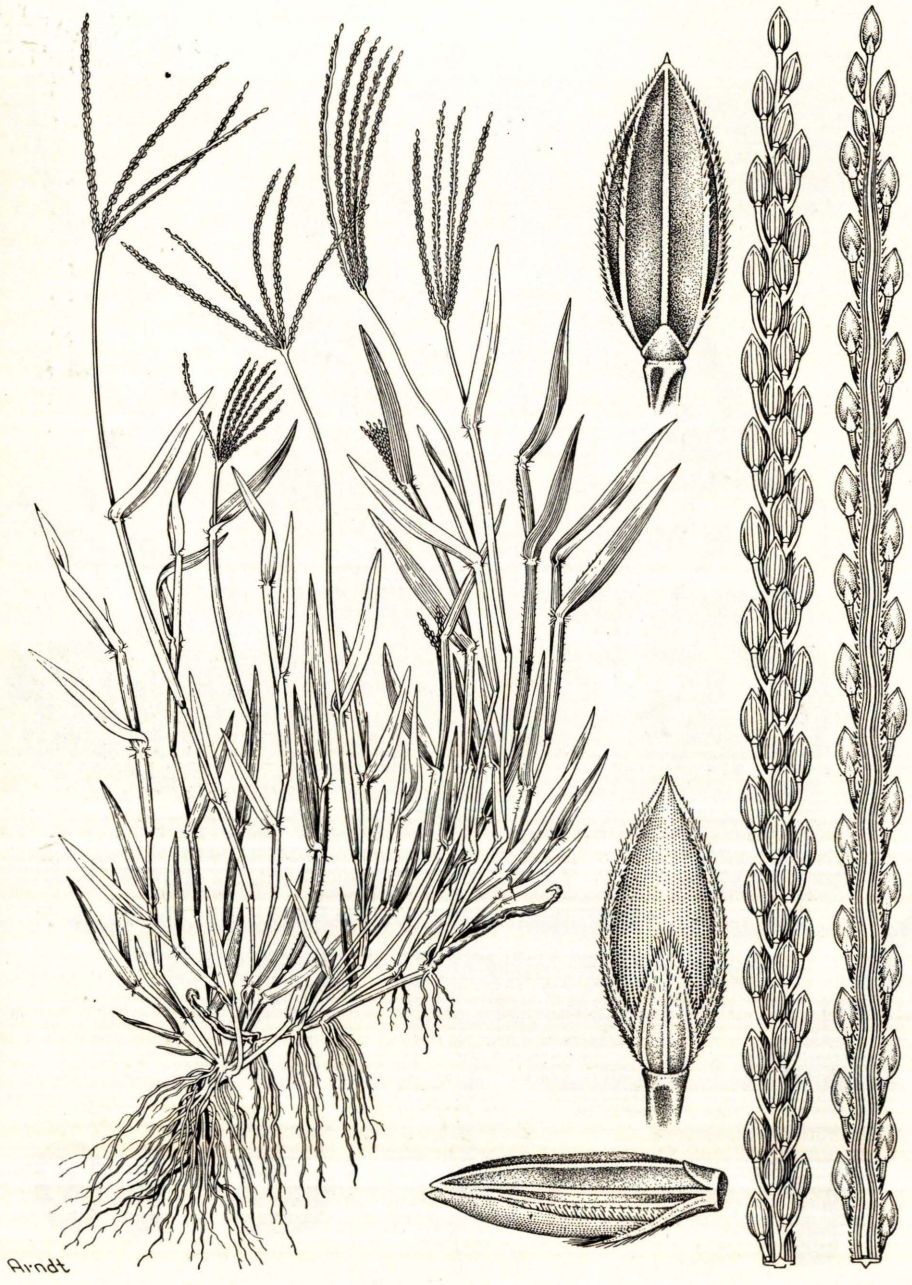
The use of 1 pound of 2,4-D per acre is suggested for the control of weeds in first-year strawberry beds and in non-fruiting older plantings. 2,4-D should not be used on flowering or fruiting strawberries. Newly set strawberry plants should not be sprayed until such plants are well established in the soil.

Raspberries

Where broad-leaved weeds are a problem in raspberries, they can be controlled with 2,4-D and dinitros. Use ½ to 1 pound per acre of 2,4-D early in spring when weeds are small —not over 1 inch tall.

Dandelion

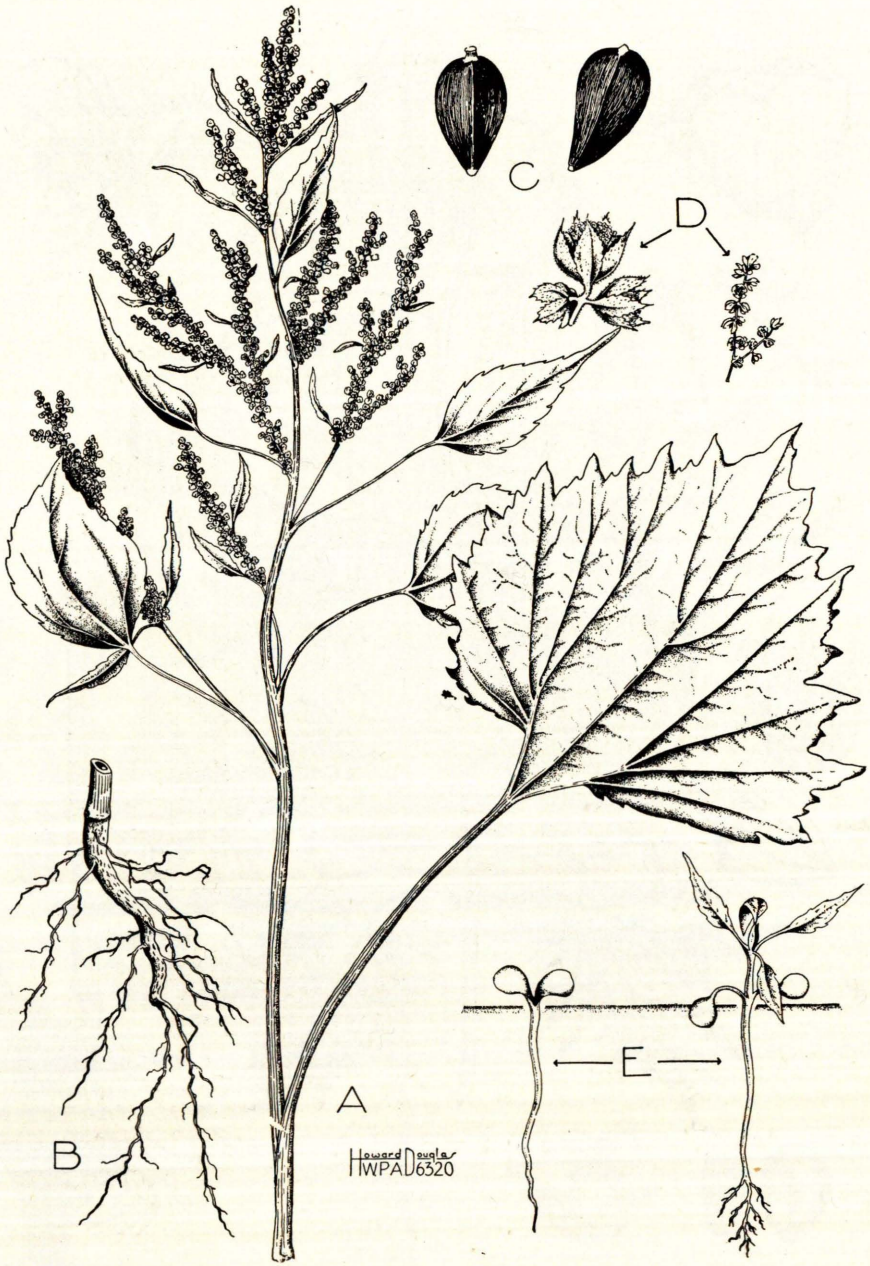
Chickweed



Crabgrass

Kochia (Fireweed)

Ragweed



Marsh Elder

Foxtail (Pigeon Grass)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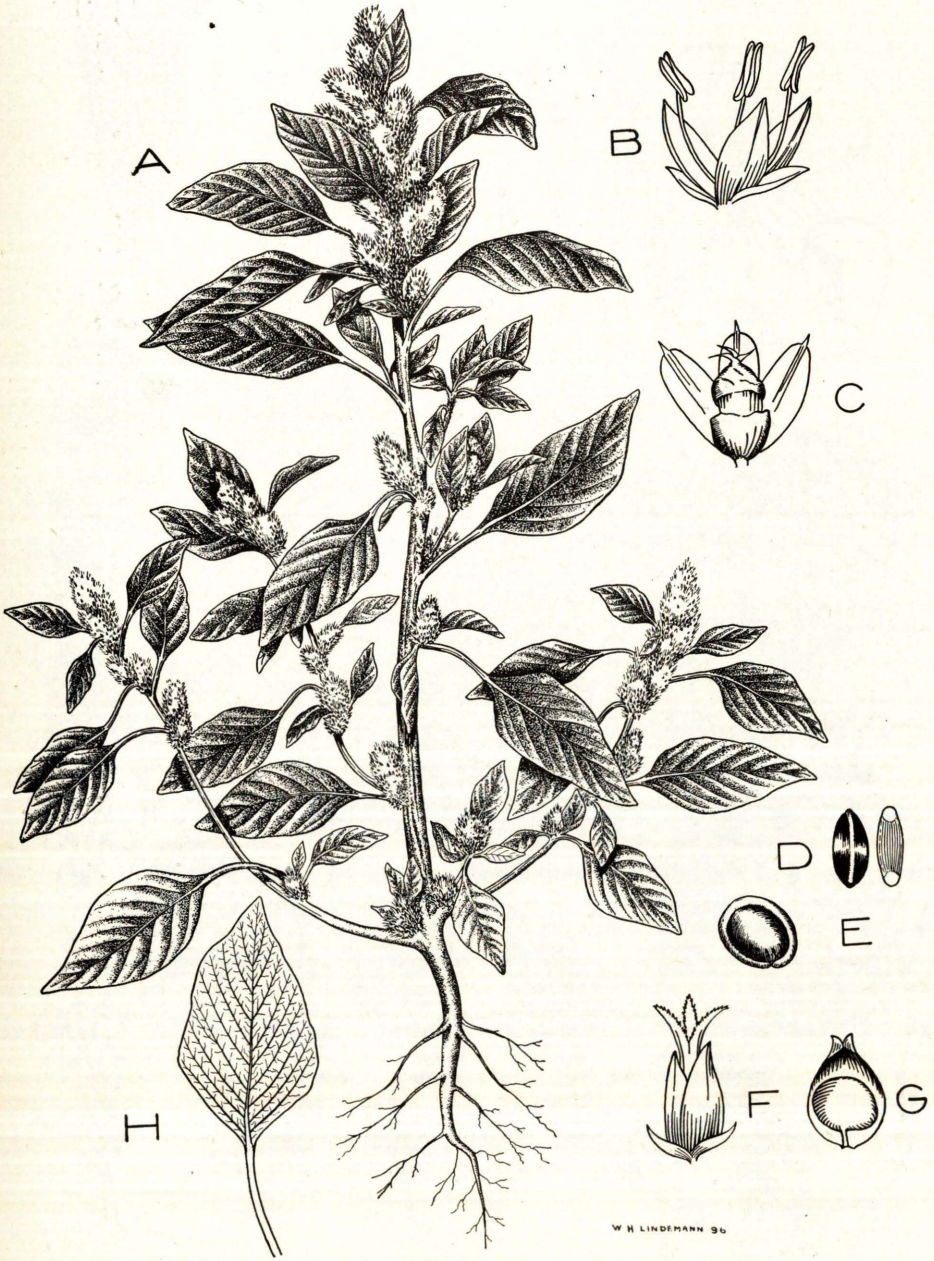
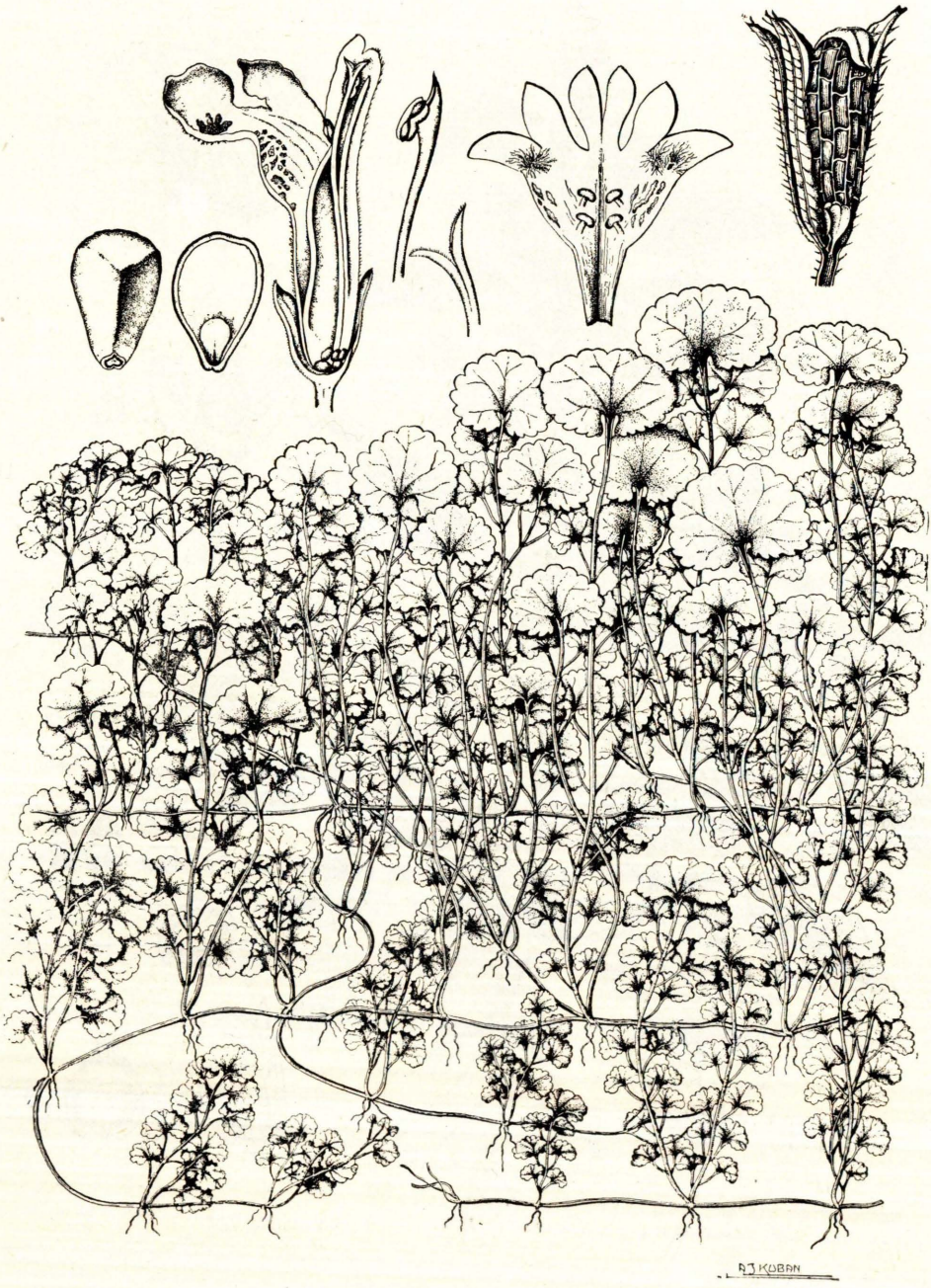
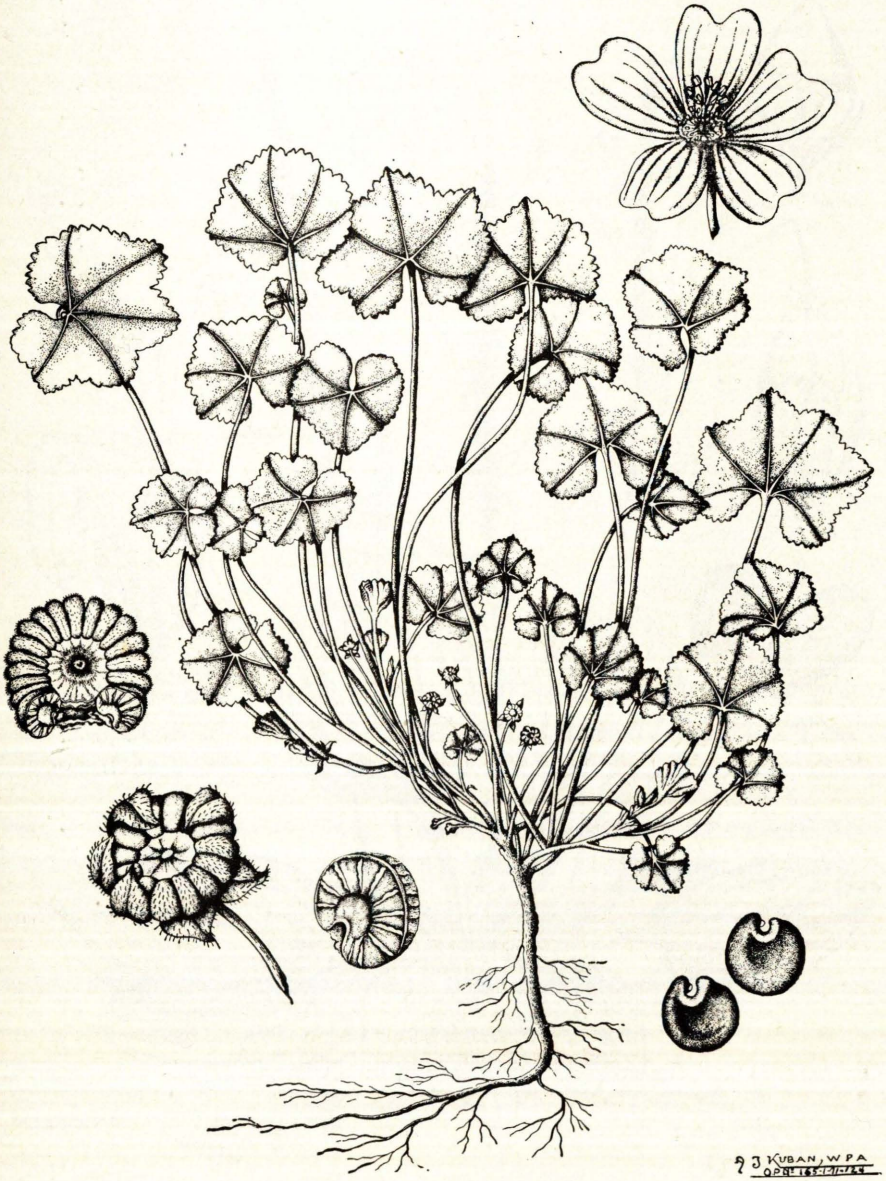
Purslane



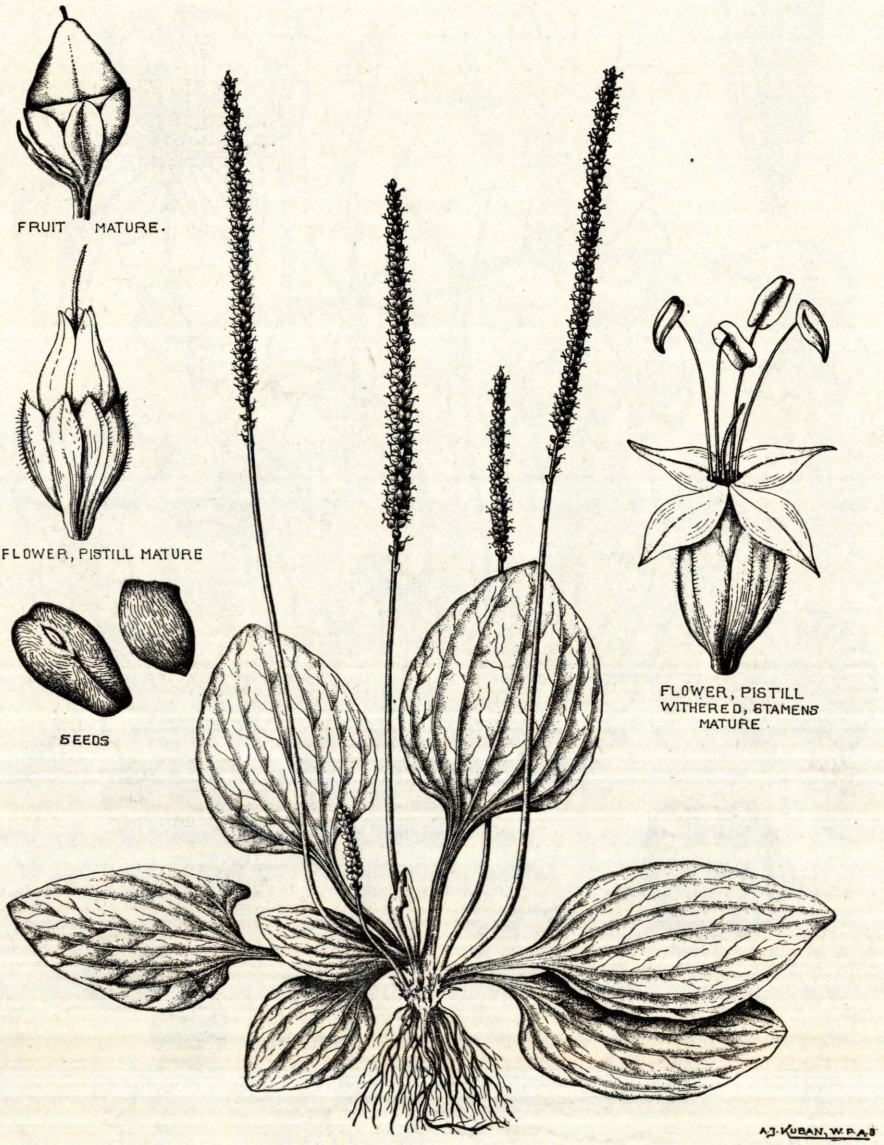
Rough Pigweed



Ground Ivy



Low Mallow



Major Plantain

Shepherd's Purse

Knotweed (Prostrate, above; **Erect,** below)

Wild Lettuce

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George I. Gilbertson, Director of Extension