

CHAPTER XV

WEEDS

Why Weeds Grow—The Difference between Grass and Weed Seeds—Seeds of Grasses commonly found in Turf—Weeding Young Grass—Weeding Turf—System A, The Destruction of Daisies and other Creeping Weeds—System B, Clumps of Creeping Weeds—System C, Plantains, etc.—System D, Weeds with Long Tap Roots—System E, Coarse Grasses—System F, A Hopeless Case—The Identification of Weeds—Dove's-foot—Shepherd's Purse—Sorrel—Daisy—Yarrow—Self-Heal—Chickweed—Mouse-ear Hawkweed—Pearlwort—Crowsfoot—Sea Pink—Common Plantain—Buckshorn Plantain—Rib Grass—Sea Plantain—Cat's-ear—Dandelion—Sow Thistle—Couch Grass—Yorkshire Fog—Cocksfoot—Poa Annuæ—Clover—Other Weeds—The Distribution of Weed Seeds.

Why Weeds Grow

According to Biblical history weeds were sent to vex mankind, and, undoubtedly, they act their part with the utmost persistence and success. They continue to vex not only those interested in turf, but also all who till the earth for profit or pleasure. Some people, chiefly city dwellers, are under the impression that because soil or turf looks clean it is clean; this is probably because their opportunity for direct observation has been insufficient for them to appreciate and understand one of the commonest occurrences of nature. The air and the earth are both full of seeds, and the foulest piece of ground when freshly dug or ploughed looks quite clean, but I can state definitely that I have not seen in the course of my experience of twenty odd years a piece of ground free of these pests, and, furthermore, I never expect to.

Turning to turf, it does not matter where it comes from or what is paid for it, even though it may appear to be perfectly free, it will contain weeds either in the form of dormant seeds or perennial root stocks; a notable example of the latter is the common plantain, perhaps the worst pest of its class, which loses its foliage in the Autumn, and consequently may be present in abundance and yet be invisible.

A lawn just dug and prepared for sowing looks so beautifully clean that it seems incredible that it can contain any objectionable seeds of weeds or coarse grasses that will come up and spoil or damage the crop.

They are there and, as sure as the sun rises in the East, they will come up—few or many as the case may be—come up they certainly will and sorely vex us, more particularly should the season be bad.

It seems strange that weeds should grow so freely and robustly during a season in which even grass has a struggle to keep alive, let alone thrive. The explanation is fairly simple. Many of the weed seeds have been lying dormant for the want of one of the three factors needful for germination to proceed. These essential conditions are air, sufficient moisture and a suitable temperature.

Seeds buried deeply in the soil are frequently deprived of air until the soil is loosened and turned over as would occur in the preparation of the site for a new lawn or green.

The seeds sown are handicapped in a dry season for want of the necessary moisture, whereas the weed seeds have been swollen with moisture a long while. Access to fresh air (oxygen) starts in them, at once, the full machinery of growth and thus they get a start and the ground is for a time occupied by a crowd of undesirable inhabitants. But if, at the time of sowing, the grass seeds can at once get the three conditions necessary they, by being as it were "on top," can get so useful a start that by their growth and crowding they very effectually colonise the newly laid ground to render the weeds more or less impotent to do serious harm. In such a congenial season the weeds will show, sooner or later, but they can be more easily dealt with when the grass has made good progress in advance.

Weed seeds are distributed at random, so they may come up more or less regularly or in isolated colonies.

The Difference Between Grass and Weed Seeds

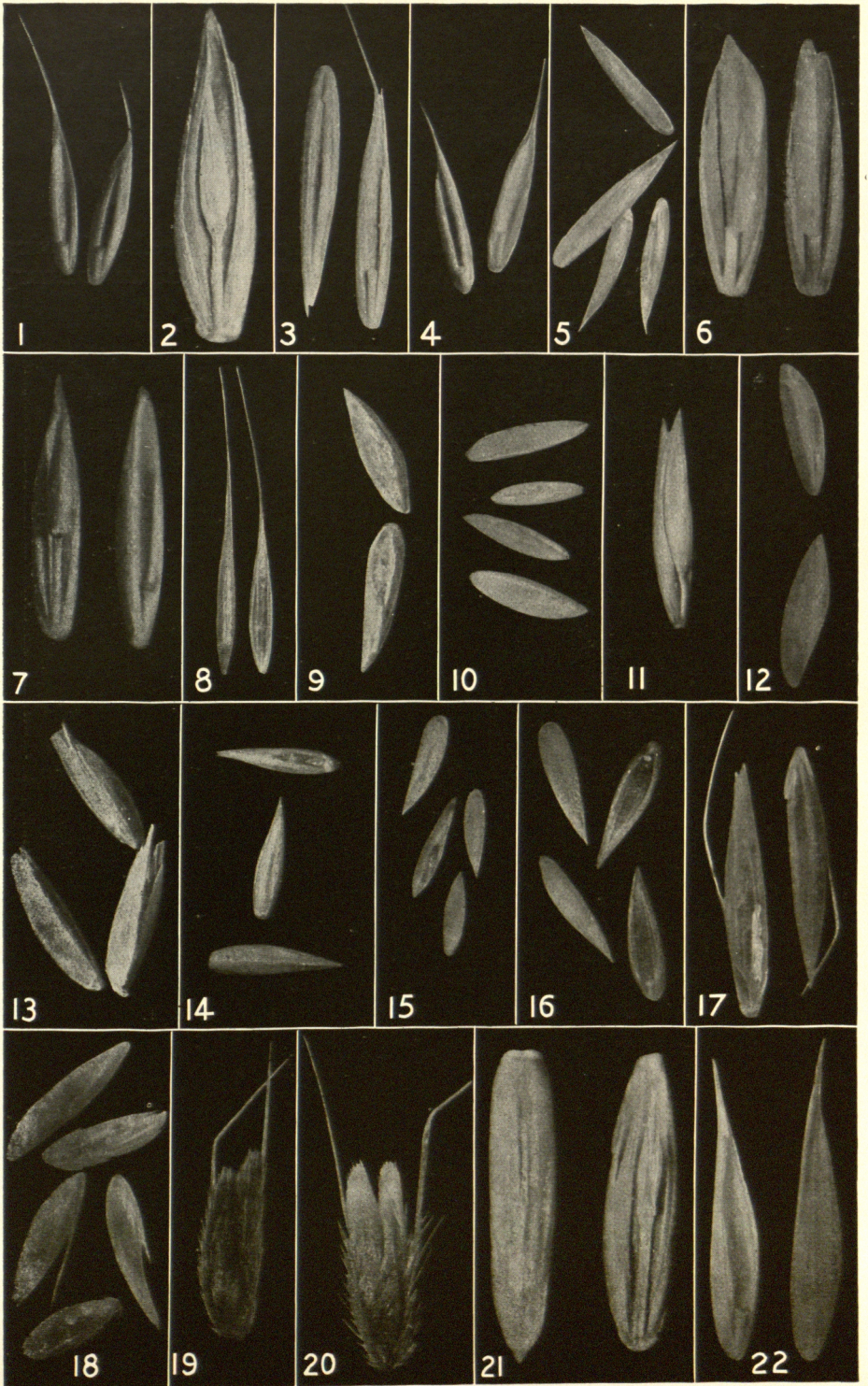
It is just as impossible to find weed seeds in soil, without a proper outfit and the necessary knowledge, as it is to detect typhoid germs in crystal clear water, but the seeds when isolated are very easily identified. There is no similarity between the seeds of weeds and grasses, they all differ in size, shape, weight and colour, and can just as easily be distinguished one from another as a Rolls-Royce from a Ford.

If you do not believe that innocent-looking soil can harbour all sorts and conditions of seeds, just put a quantity in a seed pan, place it in the greenhouse, and note results.

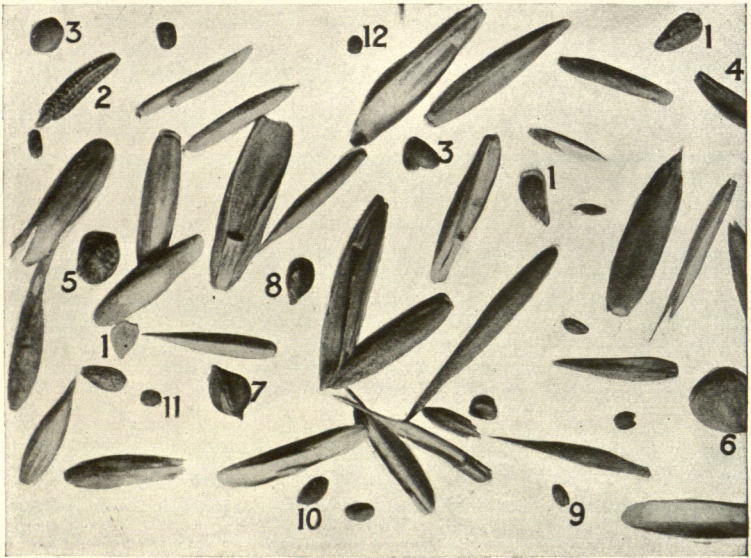
Micro-photographs of Seeds of grasses commonly found in turf.

Figures in brackets indicate magnification in diameters.

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|-----|---------------------------------|-------|----------------------------------|
| 1. | <i>Festuca duriuscula</i> | .. | Hard Fescue (5). |
| 2. | <i>Festuca elatior</i> | | Tall Fescue (10). |
| 3. | <i>Festuca heterophylla</i> | .. | Various leaved Fescue (5). |
| 4. | <i>Festuca ovina</i> | | Sheep's Fescue (5). |
| 5. | <i>Festuca ovina tenuifolia</i> | | Fine-leaved sheep's Fescue (5). |
| 6. | <i>Festuca pratensis</i> | .. | Meadow Fescue (5). |
| 7. | <i>Festuca rubra</i> | | Red Fescue (10). |
| 8. | <i>Festuca sciuroides</i> | .. | Hair grass (3). |
| 9. | <i>Poa annua</i> | | Annual poa (6). |
| 10. | <i>Poa compressa</i> | | Canadian blue grass (10). |
| 11. | <i>Poa nemoralis</i> | | Wood meadow grass (10). |
| 12. | <i>Poa pratensis</i> | | Smooth-stalk meadow grass (10). |
| 13. | <i>Poa trivialis</i> | | Rough-stalk meadow grass (5). |
| 14. | <i>Agrostis alba</i> | | Red top (Marsh Bent-grass) (10). |
| 15. | <i>Agrostis canina</i> | | Creeping Bent (Brown Bent) (10). |
| 16. | <i>Cynosurus cristatus</i> | .. | Crested Dogstail (5). |
| 17. | <i>Aira flexuosa</i> | | Wavy Hair Grass (6). |
| 18. | <i>Aira caespitosa</i> | | Hair Grass (Tufted) (10). |
| 19. | <i>Anthoxanthum odoratum</i> | | Sweet Vernal Grass (10). |
| 20. | <i>Anthoxanthum puellii</i> | | Puell's Vernal Grass (10). |
| 21. | <i>Lolium perenne</i> | | Perennial Rye Grass (10). |
| 22. | <i>Dactylis glomerata</i> | | Cocksfoot (5). |



A micro-photograph of Grass and Weed Seeds, showing how easily they can be identified by the use of an ordinary magnifying glass.



- | | |
|-----------------|--------------------------------|
| 1. Daisy. | 7. Dock. |
| 2. Dandelion. | 8. Prunella. |
| 3. Clover. | 9. Star of Buckshorn Plantain. |
| 4. Sow Thistle. | 10. Common Plantain. |
| 5. Spurrey. | 11. Shepherd's Purse. |
| 6. Buttercup. | 12. Chickweed. |

Weeding Young Grass

I have endeavoured to make it quite clear that a crop of weeds and coarse grasses must be expected every time the ground is broken, even with a rake, and it is no use grumbling at them. That is simply a waste of time. They have got to come out if a good lawn is required, and the sooner they are taken in hand the better and the easier it will be to eradicate them.

The best method to adopt is to place a plank along the edge of the lawn, and whilst standing on it remove all the weeds and coarse grasses within reach, then step off the plank, turn it over and proceed as before.

If the weeds are taken in hand when they are young and before they have had time to root deeply, and so get established, they will come out quite easily, often by just pulling them, without the use of a tool, and little or no damage will be done to the surface. The scars left by the weeds will in most cases heal up, but it is just as well to drop in each a little finely sifted soil mixed with the same mixture of grass seeds as originally used in the proportion of 4 lb. to a barrow-load, and finish off with a wooden roller.

Weeding Turf

This is a proposition which must be divided into several sub-headings owing to the different varieties and habit of the weeds likely to be encountered.

SYSTEMS "A" AND "B."

Creeping weeds with spreading stems such as daisies, self-heal, yarrow, chickweed, etc.

SYSTEM "C."

Small tap-rooted weeds, which at times grow in appalling numbers, such as the common plantain (*Plantago major*), so prevalent in inland lawns, and the Star plantain (*plantago coronopus*), the pest of the sea-side.

SYSTEM "D."

Large tap-rooted weeds, dandelions, docks, rib grass, and the like.

SYSTEM "E."

Coarse grasses, chiefly Yorkshire fog (*Holcus lanatus*), and cocksfoot (*Dactylis glomerata*), very similar in appearance with broad yellowish green leaves, the chief difference being that the former has hairy foliage.

Weeding is rather a heart-breaking job unless it is done systematically and thoroughly; it is no use meandering round with a spud, or worse still cutting them off with a knife, as most tap-rooters will respond by multiplying their crowns, and so increase the trouble.

If it is desired to determine the time required to clean a certain area, weed three average square yards against the clock, then it will be easy to calculate roughly the time required for cleaning the whole lawn.

The weeds will either assume the position of master, or else they will be mastered; and once they are reduced to the latter position it will be an easy matter to keep them in subjection, provided that the work is regarded as a normal part of the upkeep and done regularly, but if they be allowed to seed for even one season, then look out for trouble. The old saw, "One year's seeding means seven years' weeding," is very true.

SYSTEM "A."

The Destruction of Daisies and Other Creeping Weeds

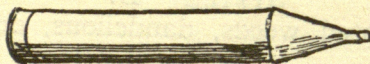
It may seem a terrible job to tackle turf containing multitudes of daisies, but I have particulars of a lawn 120 by 60 ft., which contained no less than an average of 540 daisies per square yard, or 432,000 in all, and it only took an average of $2\frac{1}{4}$ hours to treat a strip 120 by 1 ft., or 135 hours to clean the lawn.

How to Do the Work

The work should be done during still, dry, bright weather in the Autumn or Spring.

Divide the lawn into strips 2 ft. wide by means of pegs and string.

Give each worker a distributor, which is a conical tin having a lid at the larger end, at which it is filled, the smaller end having an opening $\frac{5}{8}$ in. in diameter.



TIN DISTRIBUTOR FILLED WITH "CARTERITE."

Instruct the worker to proceed as follows:—

Place the first finger of the right hand over the opening and fill the tin with "Carterite," see Supplement,

then allow the "Carterite" to escape from the tin by removing the finger for such an interval as will allow to escape, say, a saltspoonful for a small plant and larger in proportion.

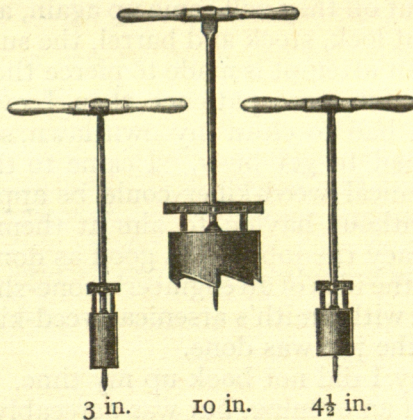
Allow the lawn to rest for a few days, so as to allow the "Carterite" to eat into the weed, then top-dress with sifted compost mixed with seed and work it well into the turf with a broom, in order to fill up all the little scars left by the dead weeds.

SYSTEM "B."

Clumps of Creeping Weeds

Large patches of daisies, self-heal, chickweed, clover, etc., should be removed bodily and replaced with clean turf. Small patches from $1\frac{1}{2}$ to 10 inches in diameter can be removed by the use of a turf renovator, see Supplement, a tool similar to a golf hole cutter, and repaired with plugs of clean turf cut with the same tool.

I do not recommend the use of turf renovators with a smaller diameter than $4\frac{1}{2}$ or over $8\frac{1}{2}$ inches, as the former are too small and the latter too difficult to use excepting on loamy soils.



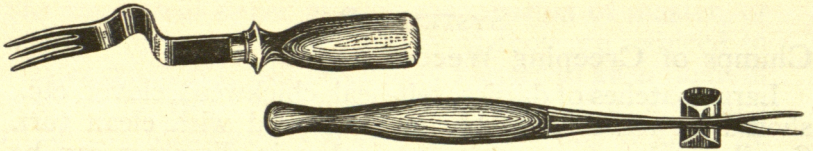
SYSTEM "C."

The Destruction of Plantains and Other Weeds of Similar Nature

The system adopted for the removal of these weeds is exactly the same as that recommended for the daisies, with the exception that they are bodily removed with a three-pronged fork instead of being killed in the ground. Great

care should be taken, however, in filling up the holes left in the turf by their removal, with sifted compost and seed, in the ratio of, say, a pailful of the former to a pound of the latter.

When deep cavities are made by the removal of large weeds or tufts of grass, tamp the filling in with the handle of the fork, until it is quite firm, otherwise it will settle and form cuppy depressions, fatal to the accurate run of a ball.



WEEDING FORKS

SYSTEM "D."

Weeds with Long Tap Roots

I think I have at last managed to hit on a scheme for the destruction of dandelions, hawkweed, etc., with long tap roots, with a minimum amount of trouble and expense. If the weeds are cut off they will come up again, and if they are actually dug out lock, stock and barrel, the surface is badly damaged. If an attempt is made to pierce them and inject poison, it calls for more patience than I ever possessed. Nevertheless, I had to clean my own lawn, some $1\frac{1}{2}$ acres in extent, so had to get busy. I came to the conclusion that if an arsenical weed-killer could be applied to them quickly and without having to aim at them with nerve-wrecking accuracy the job was as good as done. I immediately pirated the idea of an engineer's cone-shaped plunger oil feed, filled it with Smith's arsenical weed-killer, lined out the lawn, and the job was done.

Unfortunately I did not book up my time. I just spent an hour or so of an evening, but was agreeably surprised at the speed at which I got over the ground.

The Way to Do the Work

Divide up the lawn by means of pegs and string in strips about a yard wide.

Prepare a quantity of Smith's Arsenical Weedkiller at double the strength they recommend in their instructions. Fill up the ejector and screw in the plug.

Search out the weeds—they are easily seen, particularly in the Spring—and just squirt a little of the Weedkiller on to each, varying the quantity according to the size of the weed. Two or three days after treatment the foliage begins to wither, and within a week the whole weed from end to end will be found to have perished.

If the weeds have flowered and are carrying seed heads cut them off just below the surface of the ground, eject a little of the poison on to the stump, and see that the crown of the weed and its seeds are destroyed by burning. The holes left by the weeds should be filled up in the usual manner.

The ejectors, see Supplement, are made in various sizes up to 36 inches long, and can be used without bending the back or exerting any bodily effort, other than slowly walking over the turf and pressing the thumb.



As dandelions can be destroyed so easily it is obvious that plantains, etc., can be killed in the same way, provided that a smaller nozzle is used for the smaller weeds.

Arsenical Weedkillers have become rather notorious by their illegitimate use by degenerates, but there is no reason why the sane should not use them legitimately, but, of course, great care should be taken, the poison kept under lock and key, and all instruments thoroughly washed after use.

SYSTEM "E."

Coarse Grasses

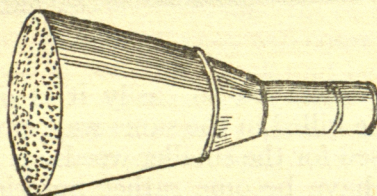
These should be cut out and replaced with good turf in the way recommended for creeping weeds, System "B," or removed individually, System "C," or if there are too many to be treated in this way, weaken them as much as possible by close cutting and slashing the hard, tufty plants across and across the crown with a knife.

SYSTEM "F."

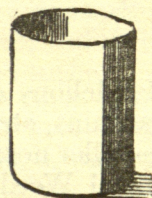
A Hopeless Case

In hopeless cases, where weeds are in such numbers and variety as to defy ordinary measures, dress the whole area with "Carterite" at the rate of four to eight ounces per square yard, applying the same by means of a dredger, see Supplement. The "Carterite" will scorch and burn everything, the turf included, but as a general rule the turf will quickly recover, and anything from 75 per cent. and upwards of the weeds will be killed.

The reason why the majority of the weeds are killed and the grass is only temporarily damaged can be understood. The "Carterite" falls between the blades of the grass to the earth, and so does only temporary damage, whereas when it falls on weeds their broad and sometimes hairy leaves catch and hold it readily, and in cases where they grow in the form of a rosette it collects in the centre and kills. I only recommend this method in cases that call for very drastic measures.



TIN DREDGER FOR APPLYING
"CARTERITE" BROADCAST



1 LB. CAPACITY
MEASURE

The Identification of Weeds

Specimens of weeds found in turf are so frequently submitted for identification that it does not seem out of place to illustrate and describe the more common and troublesome varieties.

Weeds growing in mown turf frequently assume quite a different habit to those growing under natural conditions. They all lie closer to the ground than when growing undisturbed, and their growth and foliage may be stunted to such an extent that they are difficult to recognise.

As a matter of fact the only weeds that can persist in closely mown turf are those that can adapt themselves and grow so close to the ground as to elude the mowing machine,

which would otherwise destroy them by the constant removal of their foliage. For these reasons most of the examples photographed have been taken from mown turf, and in consequence must not be regarded as botanical specimens, but simply as illustrations of weeds as they are likely to be found growing in turf.

No consideration has been given to size as the variations are so enormous, but they are all more or less complete specimens, and show their habit of growth, roots, flowers and seeds, the latter being highly magnified.



GERANIUM MOLLE. ANNUAL

Dove's-foot, Crane's-bill

- Foliage* First shows a rosette of long-stalked, roundish, hairy leaves, deeply cut into lobes.
- Type* Erect at first, but its long weak branches tend to lie prostrate.
- Peculiarities* Feels velvety soft. Flowers rosy pink, in pairs. Thrives in dry sunny places, and forms very considerable mats.
- Distribution* Fairly common generally, but most conspicuous on dry heaths and light sands.
- Eradication* It will die out if the turf is fed and kept in good heart, or it can be removed by hand. System C.



CAPSELLA BURSA-PASTORIS. ANNUAL

Shepherd's Purse, Fool's Purse (Pods open at bottom)

- Foliage* At first forms a dense rosette of long leaves usually much segmented.
- Type* Erect at first, each branch bearing numerous small white flowers 6 to 18 inches high.
- Peculiarities* Growth rapid. Very prolific in seeds that germinate at once, and so produce a succession of plants in one season. Although an annual will persist to an extent in mown turf.
- Distribution* Everywhere.
- Eradication* Easily killed under System "A" or "C."



RUMEX ACETOSA. COMMON SORREL. PERENNIAL.

RUMEX ACETOSELLA. SHEEP'S SORREL. PERENNIAL.

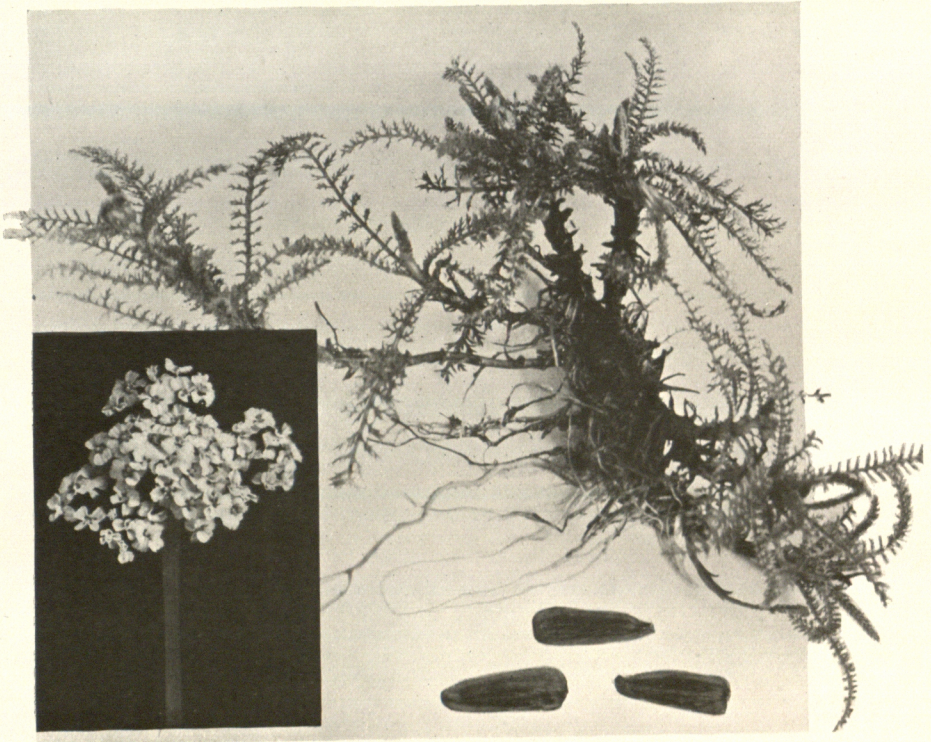
- Foliage* The leaves of the Acetosa are arrow-shaped, with two points which point backwards along the stalk, whilst those of the Acetosella are halberd-shaped, with two outspreading points at the base.
- Type* They both form strong clumps of thickly clustered leaves.
- Peculiarities* They are usually found on spent soils, deficient in lime.
- Distribution* R. Acetosa is common to damp grass lands, and its relative to dry pastures and heath.
- Eradication* They can be cultivated out by the application of chalk and fertilisers.



BELLIS PERENNIS. PERENNIAL

Common Daisy

- Foliage* Rosettes of spoon-shaped evergreen leaves.
- Type* Forms a dense mat.
- Peculiarities* Each plant, produced by a wind-carried seed, forms underground a wide-spreading system of thick horizontal stems, every branch of which forms independent roots and terminates in a rosette of leaves at the surface.
- Distribution* General, but flourishes best in heavy, worm-infested soils.
- Eradication* Individual treatment, System "A," or Broadcast treatment, System "F," or by Patching System "B."



ACHILLEA MILLEFOLIUM. PERENNIAL

✓ *Yarrow, Milfoil*

Foliage Leaves, which die off in the winter, are very much cut up, so as to look like clusters of leaves.

Type Creeps above and below the surface, and soon colonises large patches of ground.

Peculiarities Foliage has a pungent odour when bruised.

Distribution General. This weed is not very objectionable on light soils, which stunt its growth, or when growing intermingled with grasses, but is very objectionable on heavy soils, upon which it thrives to the exclusion of the grasses, and forms dense clumps.

Eradication See System "B." It can be weakened by raking, close cutting, and also by dressing the clumps with sand or breeze.



PRUNELLA VULGARIS. PERENNIAL

Self-heal

- Foliage Type* Stalked egg-shaped evergreen leaves. Creeping root-stock forming aerial shoots some few inches high. Forms low-lying dense mats.
- Peculiarities* Very flourishing on heavy, worm-infested soils. Varies much in size.
- Distribution* General, especially troublesome in moist areas.
- Eradication* Small clumps System "A," larger clumps System "B."



CERASTIUM ARVENSE. MOUSE-EARED CHICKWEED.
PERENNIAL

CERASTIUM VULGATUM. COMMON MOUSE-EAR CHICK-
WEED. PERENNIAL

- Foliage* They both bear hairy, evergreen leaves in pairs, in arvense they are narrow and in vulgatum they are broader.
- Type* Both are much branched and semi-prostrate in habit, with fairly long, flowering stems.
- Peculiarities* C. arvense has smooth stems, whilst those of C. vulgatum are sticky and hairy.
- Distribution* C. arvense is usually found on sandy and calcareous soils, the other being general to all soils, and if left undisturbed forms dense mats by the end of the season.
- Eradication* They are both easily destroyed under System "A" or "B."



HIERACIUM PILOSELLA. PERENNIAL

Mouse-ear Hawkweed

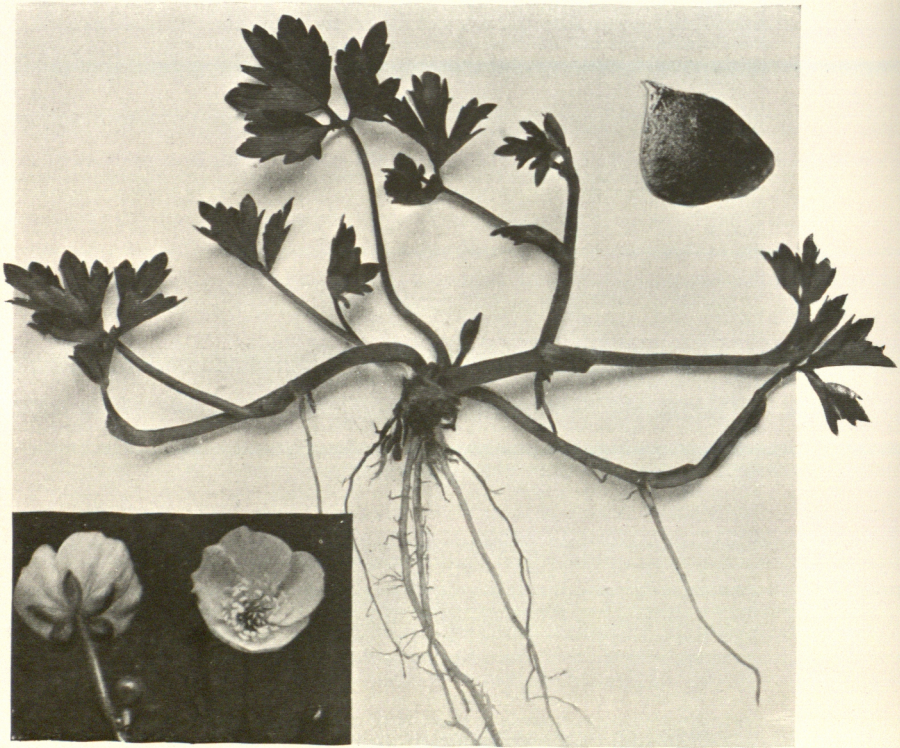
- Foliage* Small, oval, hairy, evergreen.
Type A creeping weed which spreads strawberry fashion over large areas.
Peculiarities Its flowers are borne singly, and it is the only British Hawkweed with "runners."
Distribution More or less general, but is most frequently found on dry soils.
Eradication System "B" or "C."



SAGINA PROCUMBENS. PERENNIAL

✓ *Pearlwort*

- Foliage* Very fine, velvety, moss-like and evergreen.
- Type* Much branched, prostrate in habit, and forms large dense clumps.
- Peculiarities* It bears a multitude of minute white star-shaped flowers so close to the ground as to escape the mower, and in consequence spreads very rapidly.
- Distribution* General to all soils, but perhaps is most in evidence on those of a light nature.
- Eradication* Difficult, if present in any quantity, owing to its prolific habit, but if taken in time will yield to System "A" or "B."



RANUNCULUS REPENS. PERENNIAL

Creeping Crowfoot, Creeping Buttercup

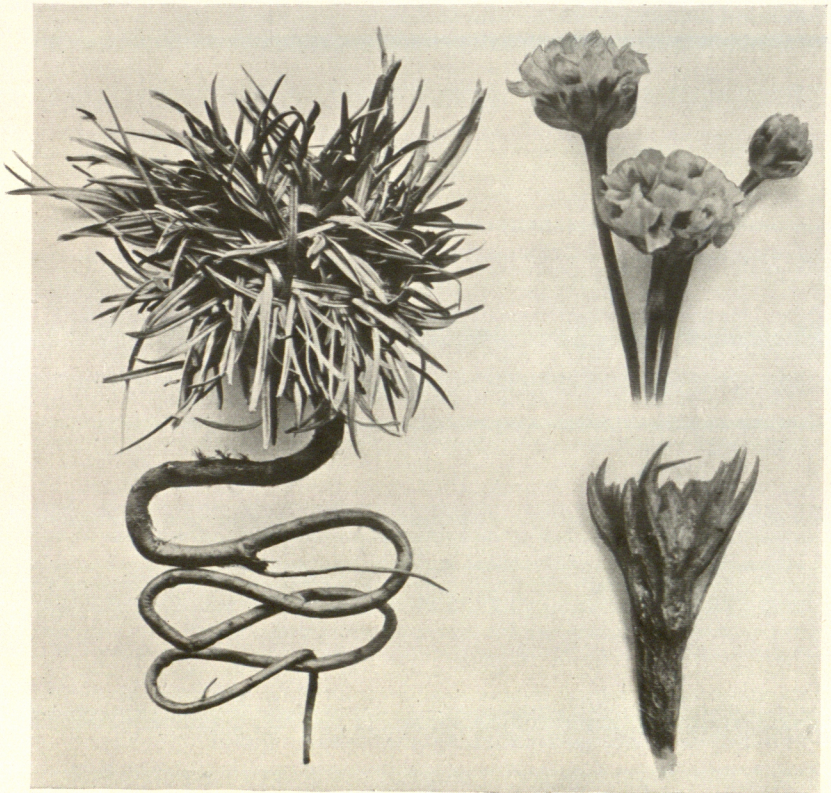
- Foliage* Evergreen leaves somewhat resemble those of buttercup, but the segments are larger, more stalked, and more hairy.
- Type* A much branched creeper forming roots at every node, and fresh rosettes.
- Peculiarities* Needs much water, and therefore occupies the damp hollows of grass-lands.
- Distribution* General in heavy, wet soils.
- Eradication* Small patches System "C." Large patches System "B."



RANUNCULUS BULBOSUS. PERENNIAL

Buttercup, Bulbous Crowfoot

- Foliage* Evergreen leaves divided into three deeply lobed segments. Hairy.
- Type* A rosette of leaves springing from a bulb-like root-stock.
- Peculiarities* The sepals are bent back under the petals.
- Distribution* General. Prefers the drier parts of grasslands.
- Eradication* The only way is to dig them up. See System "C."



STATICE MARITIMA OR ARMERIA MARITIMA. PERENNIAL
Thrift, Sea Pink

- Foliage* Leaves narrow, one-nerved, grass-like, ever-green.
- Type* Strong, branching perennial root-stock forming each season dense tufts of leaves.
- Peculiarities* Common in Cumberland turf.
- Distribution* Native to sea shores and mountains. Flourishes in muddy and sandy soils.
- Eradication* Best removed before laying the turf, otherwise System "C."



PLANTAGO MAJOR. PERENNIAL

Common Plantain, Great Plantain

- Foliage* Broad oval leaves, which die off in the winter.
- Type* Single rosette on strongly rooted short stems.
- Peculiarities* Fruiting stems very wiry, which on rolled ground lie so flat as to escape the lawn mower. Seeds are kicked out and spread by pedestrians.
- Distribution* General, but thrives best on heavy soils. Worms pull the seed heads under the ground.
- Eradication* The best way is to fork them out before the flowering season. See System "C." Large bold plants should be treated with weedkiller, System "D." System "F" may be best where the ground is infested with large numbers of small plants.



PLANTAGO CORONOPUS. ANNUAL OR BIENNIAL

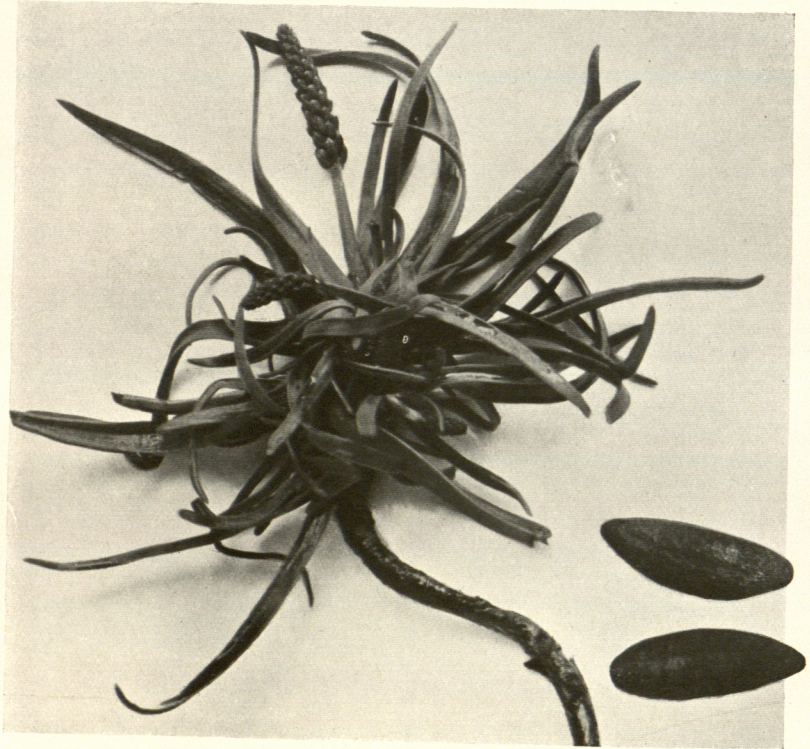
Buckshorn or Star Plantain

- Foliage* Narrow leaves which die down in the winter, very deeply cut along the margins into several lobes.
- Type* A flat rosette one to six inches in diameter, with long tap root.
- Peculiarities* The only plantain with cut leaves. It is so prolific and grows so quickly that it gives one the impression that it is a perennial.
- Distribution* A lover of dry sandy soils.
- Eradication* The only way is to fork them out before the flowering season, see System "C," or if they are large, bold plants destroy them with weed-killer, System "D." When they occur in such multitudes of small ones that it is impossible to adopt either of the above methods, try System "F."



PLANTAGO LANCEOLATA. PERENNIAL
Ribwort Plantain, Rib Grass, Hardheads

- Foliage* Long lanceolate evergreen leaves with five prominent ribs.
- Type* A prominent cluster of uplifted leaves stands at ground level borne by a short root stock. Six inches to a foot in diameter.
- Peculiarities* Unlike the other plantain, its leaves and fruiting stalks stand more or less erect, and are therefore more at the mercy of the mowing machine.
- Distribution* Grasslands, general. All kinds of soil.
- Eradication* A very tough weed, which will break out again if the crown is cut off. It is best dealt with under Systems "C" and "D."



PLANTAGO MARITIMA. PERENNIAL

Sea Plantain

- Foliage* Narrow fleshy leaves closely resembling those of Thrift. Leaves die off as winter comes.
- Type* Rosettes at ends of branching underground stems. Average four inches in diameter.
- Peculiarities* Its perennating root-stocks and its grass-like leaves often enable it to get a big hold on Cumberland turf greens before it is noticed.
- Distribution* Shores and wet places subject to occasional inundations by high tides.
- Eradication* The larger root-stocks should be removed before laying the turf, and those that escape, see System "C."



HYPCHÆRIS RADICATA. PERENNIAL

Cat's-ear

- Foliage* Leaves very like those of a dandelion in outline, die off in the winter.
- Type* A dense flat rosette surmounting a strong upright root-stock.
- Peculiarities* In habit, growth and seed dispersal very similar to the dandelion and common hawkweed. Flowering stems branched. The root-stocks contain dormant buds.
- Distribution* General to all kinds of soil.
- Eradication* System "D."



TARAXACUM OFFICINALE. PERENNIAL

Dandelion

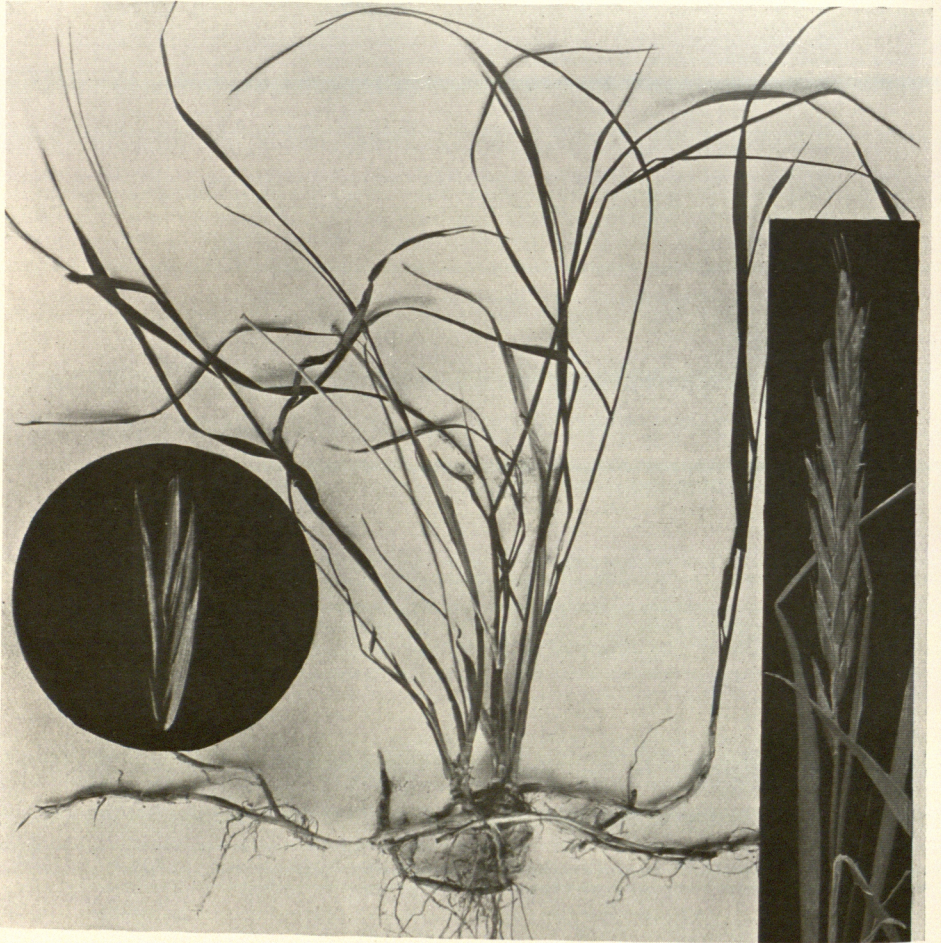
- Foliage* Leaves, which die off in the winter, have margins cut into large teeth, hence its name "Lion's tooth."
- Type* A flat rosette.
- Peculiarities* The long tap root is contractile, a device which keeps each succeeding rosette of leaves level with the surface of the ground. Seed well adapted to aerial transport.
- Distribution* Found everywhere and in all kinds of soil.
- Eradication* It is almost impossible to dig them out. They can be killed with greatest ease by treating them individually with weedkiller. See System "D."



SONCHUS OLERACEUS. ANNUAL

Sow Thistle

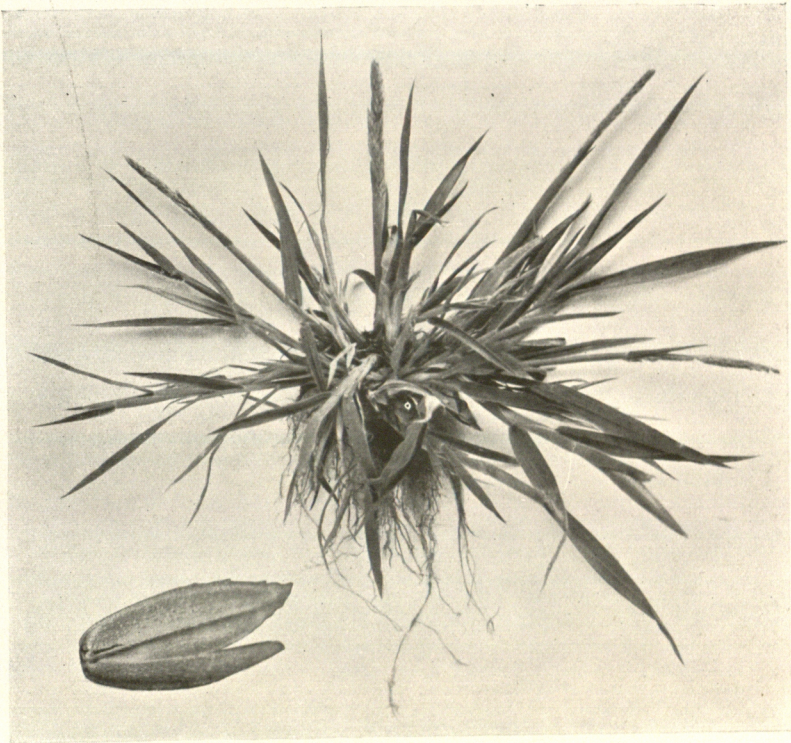
- Foliage* Toothed, hairy, evergreen.
- Type* A flat rosette similar to the dandelion.
- Peculiarities* A tall-growing weed which is able to adapt itself and live in mown turf. Seed well adapted to aerial transport.
- Distribution* General, but does best on medium to heavy soils.
- Eradication* Treat individually with weedkiller, System "D."



TRITICUM REPENS (AGROPYRON). PERENNIAL

Couch, Twitch or Quick Grass

- Foliage Type* Evergreen, coarse and rough
Spreads by long, slender, creeping much branched root-stocks, which produce stiff, upright, leaf-bearing stems.
- Peculiarities* Owing to the rapid penetration of soil by the root-stocks it quickly gains mastery over large areas. Digging spreads it because every piece of root-stock forms a new centre of development.
- Distribution* Chiefly troublesome on arable lands. Usually absent in well-managed grass. All kinds of soil.
- Eradication* Keep it closely mown and it will die out.



HOLCUS LANATUS. PERENNIAL

Yorkshire Fog, Meadow Soft Grass

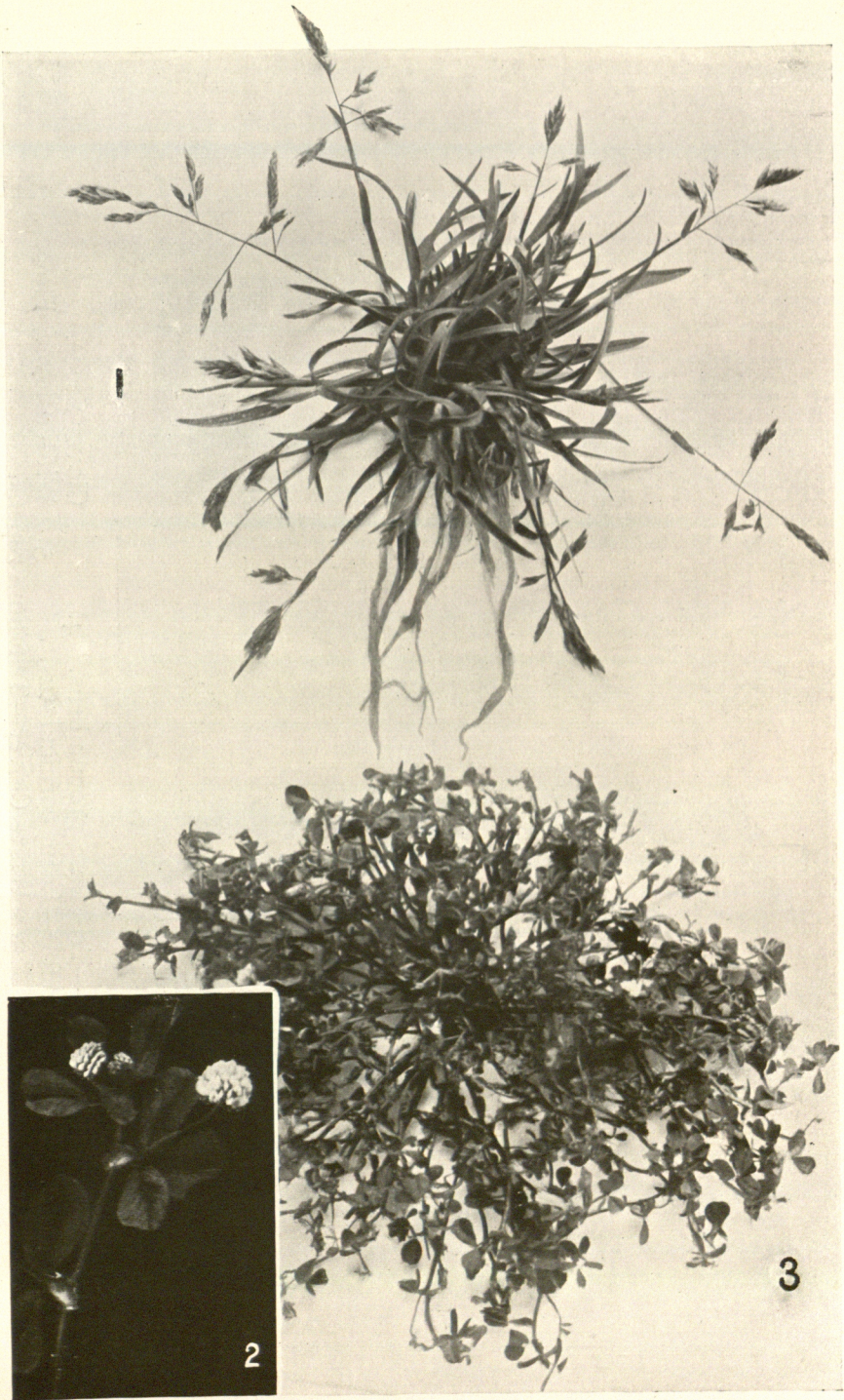
- Foliage* Light in colour, evergreen, broad, flat and very woolly.
- Type* Creeping with surface and underground stems forming greyish patches.
- Peculiarities* Sap has a bitter flavour distasteful to all kinds of herbivorous animals, hence its powers of spreading are greatly multiplied.
- Distribution* Common in all pasture lands. Thrives best on heavy to medium soils.
- Eradication* Cut it out, System "B," or slash it, System "E."



DACTYLIS GLOMERATA. PERENNIAL

Cocksfoot Grass

- Foliage* Light in colour, evergreen, broad flat and smooth.
- Type* Creeping with surface and underground stems forming rough coarse patches.
- Peculiarities* Very similar in appearance to *Holcus lanatus*, with which it is frequently confused.
- Distribution* Common to all pasture lands. Thrives best on medium to heavy soils.
- Eradication* Cut it out, System "B," or slash, System "E."



1. *Poa Annua*. 2. Suckling Clover. 3. *Trifolium minus*.



1. Hop Clover—*Trifolium procumbens*. 4. Clover Seeds.
 2. Birdsfoot Trefoil—*Lotus corniculatus*. 5. White Clover, Flower.
 3. White Clover—*Trifolium repens*.

Poa Annua

The annual poa can best be described as a robber grass. Its seeds are produced more or less all the year round, but chiefly in May and June. They are very light and well adapted to aerial transport, and it is the only grass that has the power of shortening its fruiting stems, and so escapes the closest mowing.

It will grow anywhere it can find lodgment, from the gutters of houses to gravel paths, and as it is able to reach maturity, ripen and shed its seeds in six weeks, it is not surprising that it is found in great abundance in most turf.

It starts in growth before and grows quicker than any other grass, its foliage in the Spring is soft, velvety and vivid green, changing to a whitey yellow when in full flower, when the ripening seed heads make the herbage harsh.

It is very noticeable when it begins to take possession of Cumberland turf or lawns sown with fine grasses by its colour, tufty growth and seed head, and if it is not removed, see System "C," as soon as it is noticed it will in a very short time crowd out and master the finer, slow-growing grasses.

It is the first to feel the effects of drought, and the first to respond to rain or fertilisers, particularly those rich in nitrogen, so if it is present in such quantity as to form an integral part of the turf, feed and water regularly.

Amongst other peculiarities it ripens and sheds its seeds individually, consequently they cannot be harvested and are not generally in commerce.

Clover

There are many different species of the *Trifolium* family which are found on all soils from the lightest sands to the heaviest clays, but the following are the greatest trouble to the groundsman:—Suckling Clover, *Trifolium minus*, grows with a single tap root, and is easily eradicated, see System "C," but White Clover, *Trifolium repens*, Birdsfoot Trefoil, *Lotus corniculatus*, also Hop Clover *Trifolium procumbens*, creep above and below the surface and form large clumps.

They grow poorly on light soils and robustly on good soils, and send out strong surface runners which root at each joint, and their foliage keeps its colour during a

drought long after the grass is burnt yellow. They condense and hold the dew longer than grass, are soft, pulp and wear badly under foot, go off during the Winter and leave a naked network of runners on the surface. White Clover is sometimes included in mixtures and is useful in special cases, but in general practice it can only be regarded as a weed.

In common with all other members of the Leguminous family their roots bear wart-like tubercles, which are produced by and become the homes of friendly bacteria. These organisms have the power of extracting free nitrogen from the air and forming nitrogenous compounds within the tubercles which the host-plants are able to utilise for their own nourishment. They are, however, hungry for phosphatic fertilisers such as Bone Meal, Basic Slag, etc. When they grow so close as entirely to choke out the grasses, they are very objectionable, but they are not such a nuisance when they intermingle with the grasses.

The creeping varieties are difficult to eliminate, but they can be checked by the use of Carters Anticlover Grass Fertiliser No. 2, see Supplement, weakened by raking and close cutting, and on heavy soft soils by the use of sand and charcoal. It is claimed that, if cut as close as possible by an expert scytheman or by the use of horse clippers under a hot sun, it can be weakened to the point of extinction. Large isolated clumps should be removed, System "B," and replaced with clean turf.

Other Weeds

There are many other weeds. Annuals should complete their cycle of life in one season and die as soon as they have ripened their seeds. Biennials take two seasons to achieve the same object, but, if either of them is prevented in doing this, some close-growing varieties will struggle on and persist, and this explains why annual weeds, other than those that can produce seed in spite of the closest mowing, are occasionally troublesome in the turf.

Perennials have a long life, and are the only really troublesome class, some retain their foliage all the year round, others lose it in the winter, and they all multiply very rapidly.

Fortunately for the Greenkeeper and the Groundsman the great majority of weeds cannot live in mown turf, for

the reasons that I will now explain in language which I can understand, in the hope that others may.

The leaves of plants have many important functions to perform, and they may, in fact, be described as a factory where all soil water containing inorganic salts such as Nitrates, absorbed by the root system, is used for the manufacture of food materials. The bulk of the absorbed water is discharged into the atmosphere in the form of invisible vapour, the rest being split up into its component parts, Hydrogen and Oxygen. Simultaneously, the air is passing through the tissues of the leaves and is cleaned of its Carbon-dioxide gas, which is retained, to be at once separated into Carbon and Oxygen. The three elements, carbon, hydrogen and oxygen, thus obtained are then utilised to make starch. In the process of manufacture, all the carbon and hydrogen are used up, but only a portion of the oxygen. The remainder of the oxygen is then discharged into the air, thus purifying it.

The elements retained are the raw materials of the factory, the finished articles being Carbo-hydrates (Starch and Sugar), oil, fat and proteid substances, or in other words, the food of the plant.

The roots do not directly have anything to do with the manufacture of the food, but they do take a considerable part in supplying the factory requirements.

All of the food when made is not immediately consumed, except in annuals; biennials and perennials store the surplus in the tissues of the stem and root stock for future use.

If the leaves are removed from a plant well stocked with food, it quickly grows a fresh crop, and so restarts the factory, but in doing so, uses up a certain amount of its stored food, and if the leaves are repeatedly removed, the plant gradually weakens as the food is used up, until there is no more left and the plant dies.

On the other hand, a plant that does not possess a store dies as soon as its leaves are removed.

This plainly demonstrates that the only plants that can live in mown turf are those that lie so close to the ground that the mowing machine cannot remove all their foliage. To make the point clear, compare the dandelion with the dock; both of these plants produce large fleshy root stocks which contain huge stores of food. The dandelion is provided with a contractile root which keeps its crown

well out of the reach of the closest cutting machine, and in consequence it is able to retain its foliage. The dock cannot perform this trick, with the result that it loses its foliage each time the machine passes over it; and each time its foliage is removed its food store is drawn upon, until the inevitable happens, an empty larder and death.

The Distribution of Weed Seeds

Seeds are provided by nature with so many devices for their distribution, that it is in itself an interesting study. In some cases when the seeds are ripe the stems become so springy that the slightest touch will project the seeds many yards. Others are fitted with hooks, burrs or sharp spines which attach themselves to the coats of animals and the clothing of man. Birds are responsible for the transport of many, whilst thistles, dandelions and the like are fitted with sails or parachutes which carry them large distances. If one walks through long grass in the summer time, quite a collection of seeds will be found in the tucks of one's trousers, or attached to one's stockings, so it is hardly surprising that weeds appear to grow spontaneously.

This is just about all I know about weeds; and whilst it is evident that they can be destroyed by repeatedly cutting off the tops, I submit that it is easier to remove them bodily or to kill them.