Collecting plant specimens. 2. Specimens for disease identification

G C. MacNish
COLLECTING PLANT SPECIMENS

1.—SPECIMENS FOR IDENTIFICATION

By R. D. ROYCE, Officer in Charge, Botany Branch

PLANT NAMES and the naming of plant specimens are of fundamental importance in many branches of science, including agriculture. To the farmer, too, accuracy in naming poisonous plants and weeds, as well as fodder and pasture species, can save much trouble and expense, and may be responsible for avoiding heavy stock losses.

The most important requirement for the successful naming of a plant is a good specimen to work with. Too often, damaged or insufficient material is submitted to the Department of Agriculture, and while some of these specimens can be named with a fair degree of certainty and others with some doubt, the majority cannot be classified at all, until better material is made available.

Collection:

It is important that specimens submitted for naming should show as much of the structure of the plant as possible.

To be of maximum use a specimen should be at least nine to 10 inches long, show the arrangement and attachment of the leaves on the stem, and should carry a number of buds, flowers or fruits. Where possible all three should be included, as a complete series of these structures makes positive identification much easier. If only one is available, it should be forwarded with the attached leaves.

Generally speaking it is advisable to take at least two specimens to allow for accidents and to provide a duplicate set where required.

When selecting material for the preparation of a botanical specimen, many factors have to be considered. In the case of small herbs, the whole plant, including roots, should be taken. When specimens which have only one flower a plant are collected, a number of such plants should be gathered and treated as one. Grass specimens for instance, should be collected in this manner, so that they show the base of the plant, the roots and the barren stems as well as the flowering stem.

Specimens collected from trees or shrubs must be truly representative of the plant from which they come, and of course should carry at least one flower, preferably more.

Preparation:

When a botanical specimen from plant material collected in this way is being
prepared, some means of flattening and drying it out is necessary. Most farmers would send no more than half a dozen specimens at one time for naming. The preparation of these as pressed specimens is relatively easy. In most homes there is a pile of newspapers or magazines in one room or another and this pile is an ideal press for small numbers of specimens.

The plants are simply placed between some of the papers at the bottom of the heap and left for a week or so. Glossy papers must be avoided as they do not absorb the moisture from the leaves and flowers. At the end of, say, eight or 10 days the plants should be completely flattened and dried out. They should be numbered consecutively for ease of reference in the letter of reply, packed between sheets of cardboard, addressed and forwarded to the Botany Branch, Department of Agriculture, South Perth.

Description:

The value of these specimens can be greatly increased if a few notes concerning each plant are forwarded with the pressed material.

**2.—SPECIMENS FOR DISEASE IDENTIFICATION**

By G. C. MacNISH, Plant Pathologist

PLANT SPECIMENS submitted to the Department of Agriculture for disease identification are referred to officers of the Plant Pathology Branch, and in most cases a rapid diagnosis can be made.

Often, however, the specimens arrive in such poor condition that diagnosis is difficult or even impossible.

Some specimens have arrived as a putrid or disintegrated mass of material enclosed in a plastic bag. Leaf material received has often become so parched and dry that it has broken into many small pieces.

In these cases it very difficult, if not impossible, to diagnose the disease and to give advice on corrective or protective measures to be taken.

I would like to suggest several rules that can be followed, when forwarding specimens, which will help us to give you the correct and most rapid diagnosis of your problem.

These notes should give details which are not readily obtained from the specimen itself. Such things as size of the plant, soil type in which it grows, associated vegetation, colour of the flower, locality and date of collection are important, and could assist materially with the identification.

Even more important when submitting specimens of exotic plants for naming, are such details as the country of origin, or the history of the plant, where the seed originated, and any peculiarity of the plant concerned. Under some circumstances a relatively poor specimen can be named with certainty, if full and detailed notes about the plant are available.

Lastly, it is most important that the name and address of the sender should be placed inside the parcel. If these essential details are only recorded on the outer wrapping of the parcel, as it so frequently is, it is comparatively easy to lose the identity of specimens when several are delivered to the Herbarium at the one time. The ideal arrangement is to include a covering letter in the parcel with the specimens.

1.—Send suitable material

Select material which is typical and, if possible, shows a range of symptoms from early infection to a late stage. If small enough, send the whole plant, including roots.

We suggest this practice of leaving the roots attached to the specimen because many foliage symptoms can be traced to diseases which attack the roots. On the other hand if the plant is too large, you could enclose a small parcel of root material along with the above ground parts for examination.
2.—Send adequate information

It is little help to enclose a small piece of paper with the specimen saying, "this plant appears to be dying". Enclose a letter with the specimen telling the whole story. We would like you to include the name of the plant, any changes you have seen in it, and conditions under which it has been growing.

Any additional information such as fertilisers used, chemicals applied, watering practices and the number of plants affected may also be valuable.

3.—Pack the specimen carefully

Packaging is very important, as it affects the condition in which the specimen arrives. Here a little imagination must be used, as it is impossible to lay down hard and fast rules for all contingencies.

Single leaves should be flattened and placed between layers of thick paper or cardboard, whereas cereals or grasses may be rolled in newspaper.

Succulent fruits should be wrapped with soft paper and packed firmly in a stout box to avoid bruising.

Roots with surrounding soil may be packed in a plastic bag, but when the whole plant is submitted only the roots should be enclosed in plastic and the rest wrapped in newspaper. In summer it may be advisable to make the inner layers of moist paper to help maintain the freshness of the specimens.

Send the specimens early in the week. Try to avoid having specimens, especially those of a moist nature, arrive late on Friday or during the weekend as this means they will spend several days in the post and will not be examined by the Departmental officers until Monday morning.

Lastly, send the material to the correct address. To ensure prompt attention forward your specimen to—

The Department of Agriculture,
Jarrah Road,
South Perth.

and mark on the outside of the parcel, "plant disease specimen."

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**DAMS**

By D. G. CARDER, Adviser, Soil Conservation Service, Narrogin

The ordinary excavated dam is usually considered a simple proposition but there is often more to it than just finding the clay and sinking a hole.

It is a pity that so often contractors and the farmers who employ them trust to eye judgment for the levels of a dam. Sometimes that judgment is good but sometimes the lowest part turns out to be the back wall or a back corner. This may mean that water goes over the top or at least that part of the excavation is wasted.

With a simple level, especially the water hose level, it is an easy matter to work out the levels of a site before construction begins, and to check that the back wall is high and level enough before the contractor leaves.

Most dams have been put in hollows or where water flows directly into them. This is not absolutely necessary. With knowledge of the capabilities of diversion or contour drains, it is possible to put the dam not where the water is, but where it is wanted and where there is good holding ground. This may be necessary to avoid rock or salt.

Dams can be sited with the possibilities of contour drains in mind; drains can also be used to help fill existing dams, as long as they do not have to run across sandy country. These drains need a grade of up to one in 100. They are made in exactly the same way as ordinary contour banks.

The use of contour drains to fill dams is probably more suited to the over 14-inch rainfall areas. But they depend more on heavy showers than on total rainfall. They also need a fair slope on the land.

For the sake of economy, try the contour bank first. If it proves unsuccessful, a roaded or graded catchment can be used more or less as a last resort.

Single, straight-wall dams are becoming increasingly popular. On gently sloping sites they can often hold back several times as much water as the volume of the wall. But they have to be well planned and very carefully built.
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WHEEL SLIP IN TRACTOR OPERATION

Everyone knows what wheel "spin" is—for example, when the rear wheels of a motor car spin around on mud or some other slippery surface so that the car remains at a standstill. Wheel "slip" is the same sort of thing in a less acute form. The car or tractor does not come to a complete standstill, but it travels forward a much shorter distance than it should for each revolution of its driving wheels. In such a case the wheels may be turning five times in order to move the tractor 50 feet along the ground when, if there were no wheel slip, four times would do.

![Diagram of wheel slip and no slip]

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Up to twenty per cent. wheel "slip" is not easily seen and many farmers think that wheel "slip" occurs suddenly. They regard wheel "slip" as unimportant until they can actually see it. This is far from the case. That twenty per cent. "slip" must be translated into fuel loss, work loss and horse-power loss from your tractor.

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Not only has the clay to be a very sound one, but a good bywash or overflow is essential for safety. The bywash should be very wide, and be well grassed before water is ever likely to go over it. Also there should be no sharp falls for the water to go over, such as into a creek or gully; these will eat back and may cause a lot of damage that is hard to repair.

Provision of a safe overflow is often neglected for both single-wall and excavated dams. Contractors tend to put in V-shaped bypasses with the corner of the blade, instead of bypasses that are flat, wide and shallow. They also tend to take bypasses too far around the side, as if they don't believe that water will flow downhill by itself.

Another common source of damage is to crop across the hollow or slope below the dam where overflow water has to go.

To sum up, we can look at dams from four aspects:

- The catchment, which can be increased or improved by contour banks or by roading.
- The dam itself, which does not have to be put in a hollow where water runs, but can often be put where the water is wanted and where there is good clay. Water can be taken to the dam by contour drains (except across sandy country) or a roaded catchment. The dam and its bywash can be made more efficient and safer by the use of simple levels.
- The bywash should be wide, flat and shallow, especially so for straight-wall dams.
- A grassed waterway should be left out of cultivation all the way down the slope to take the overflow.

On farms where suitable dam sites can be found, many farmers are developing their own small irrigation schemes. This requires big dams such as this one, in the Donnybrook district. A farmer cannot afford to trust "eye judgments" when having such a dam constructed.