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FACTORS IN WEED PROPAGATION

By G. R. W. MEADLY, M.Sc., Officer In Charge, Weeds & Seeds Branch

In crop and pasture plants, seed production and harvesting are of vital importance. In a negative way, the formation of seeds by weeds can be equally important.

Many weeds do not rely entirely on seeds for spreading, however, and all methods of propagation must be taken into account when endeavouring to control or eradicate them.

Weeds proliferate in three main ways:

- By spores, as in the case of algae and mosses.
- By seed—undoubtedly the commonest way, and
- By various vegetative structures, including stolons, rhizomes, corms, bulbs and tubers.

Let us consider a few examples, particularly from the angle of characteristics which may influence control measures.

Spores have many of the properties of seeds and are often adapted to withstand much more severe conditions, particularly of temperature and moisture, than the plants from which they are derived. Algae can be very troublesome in dams and swimming pools and are also a problem with some industrial processes. A number of chemicals, including copper sulphate, are used for their control. Best results can be expected by treatment before spores have been formed, as spores may...
survive treatment and remain for later propagation.

Most weeds are spread by means of seeds, many of which are adapted to increase the chances of being carried by animals, wind, water or some other agency.

The primary objective of practically any control programme is to prevent the weed from forming viable seeds. This may be done in a variety of ways, including cultivation, grazing, mowing and the use of chemicals. Arresting all seed development in any one year, however, does not mean that no further plants will appear. Many species, particularly weeds, produce a proportion of dormant seeds which remain alive in the soil for many years.

Several of our common weeds provide excellent examples of this. The double-geee, if buried to a depth of several inches, may remain alive for at least ten years, and there is evidence that wild radish seeds will survive for a similar period. The eradication of saffron thistle, Bathurst burr and caltrop is also made more difficult by the delayed germination of a proportion of the seeds.

Some plants rely to some extent on their vegetative parts for multiplication and distribution. The spread of water hyacinth is due largely to pieces breaking from the parent plants and floating away to form new colonies. Weeds such as sorrel, although they spread from seed, are also carried by implements as root fragments cut up and disturbed by cultivation. These can soon give rise to new plants.

The two types of cape tulip indicate how efficient vegetative reproduction can be. One-leafed cape tulip sets seed but the two leaved type is not known to mature seed in Western Australia and relies entirely on corms and cormils for reproduction. How effective they can be is shown by the wide distribution of this weed and the difficulty of eradication.

The dormancy problem is not restricted to seeds, and the production of dormant corms by cape tulip makes this weed even more difficult to combat.

Fortunately, recent research carried out by the Department of Agriculture has
shown that the proportion of dormant corms can be reduced considerably by burning the dry growth on infested areas during the autumn. This brings about a more complete emergence of the plants and allows control measures, both cultural and chemical, to be undertaken with greater effect.

COTTON – A Crop for the Kimberley Settlement

By W. M. NUNN, Superintendent, North-West Division

AFTER a good deal of exploratory work and research into crop production hazards, settlement of the Ord River flats in East Kimberley is at last under way. A reservoir is under construction and the first farm—the pilot farm—is already producing rice, safflower and linseed in commercial scale irrigation bays.

Research work by Agricultural Department and C.S.I.R.O. workers has been going on since 1947. Most settlement schemes in Australia have started off with very much less preliminary work so we can answer the critics with an assurance that although we may be in a new and challenging area, Kimberley is already more "researched" than was any other area in Australia when farms were first established.

However, this would not be quite true of cotton at the moment; and because cotton is a product which will pay the farmer more handsomely than the other crops already proven, we have to do a full scale job on it now in a hurry so as to be ready for the settlers who will take up blocks in only two or three years' time.

Cotton belongs to the hibiscus family, which has many well known members in our ornamental gardens; its growth and form is not unlike the apple blossom hibiscus so popular in Perth. For commercial purposes the life of the cotton plant is cut short after the main fruiting is completed from the first season of growth. This is about five months from planting. Watering is discontinued and the sudden check to plant growth causes leaves to fall, leaving the open cotton bolls exposed for collection by the spindles of the mechanical cotton picker.

Here I should add "we hope," because this is one of the remaining uncertainties—one of the circumstances we need to check and double check before permitting farmers to base their future on it. Most commercial cotton areas have a cold snap with some frosts at this stage of the cotton's growth and the frosts ensure a thorough leaf drop. Kimberley does not have a frost or even a very cool night. If cessation of water doesn't do the trick then some chemical treatments may have to be developed.

The other uncertainty that remains with us concerns the practical methods to be used on a field scale to control insect pests. Species of wild hibiscus abound in Kimberley and these serve as host plants for the many insects which damage the cotton plant and its maturing bolls.

These insects provide the reason why our knowledge of cotton is a few years behind our knowledge of other crops studied. The insects beat us for several seasons and success was not achieved until recent advances gave us new and better insecticides.

These have controlled the pests on experimental areas but we still have to do it on large areas, probably using aircraft; and we must develop these techniques to the stage where they can be enunciated for farmer use.

Next wet season a lot of effort will be concentrated on a study of these aspects of cotton as a commercial crop. Kimberley Research Station will grow about 20 acres and will study methods of obtaining the best picking results. Seed cotton from the area will go to Queensland for ginning and subsequent sale to spinners, and the full story will be available concerning quality and the manufacturing value of the Kimberley grown product.
Plans are in hand too for the cultivation of an even larger area on the pilot farm, and for this area to be used as a testing ground for aerial spraying techniques.

Whether cotton takes over as No. 1 crop from safflower, linseed and rice will, we hope, be determined by this summer programme. If it does then a ginnery has to be built along with all the other building now going on at Kununurra. If it does not, safflower, linseed and rice are profitable crops anyway, and they are straightforward ones on which sound advice can be given just as soon as the farmers are there to grow them.

- Research Officer W. J. Toms returned recently from the U.S.A., where he made an intensive study of cotton growing. The information he has gained will be applied to the large scale crops planned for next year.

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**DANGER FROM TRACTOR NOISE**

As a result of widespread interest in the risk of deafness as a result of the high noise level from tractors, the Australian Tractor Testing Committee has undertaken investigations of noise around tractors, says the Committee's annual report for the year ending June 30, 1961.

"The results of tests on several tractors showed that the sound pressure level, 105 to 110 decibels, was remarkably consistent and was much above the level of 85 to 90 decibels which is generally accepted as the upper limit in most factories and industries.

"Continuous exposure to noise above this level (85 to 90 decibels) usually leads to permanent damage to the eardrums and to permanent impairment of hearing," says the report.

"The Testing Station now includes noise level tests as part of the regular test procedure—the first station in the world to do so."

One company has submitted two spark arresters redesigned as mufflers for test as both spark arresters and mufflers.

The Committee reported that the year had been a disappointing one for formal tractor tests, but recent inquiries from tractor companies suggested that the number of applications for tests would increase in the coming year.

Other main features of the report are:

**Test Procedures.**

As a standard feature of its tests, the Committee now requires the applicants to state, and include in test reports, the "expected range of power outputs" of the tractor engine on crankshaft test. This feature has been fully accepted and the formal tests have shown that the randomly chosen test tractors fell within the expected range of output for the models concerned.

The Committee emphasises the importance it places on this matter and its desire to bring about a more rational approach to the quotation of maximum power values. It is in the interest of the manufacturer and the user alike that the notion of a falsely precise and unduly inflated single value should be resisted in favour of the quotation of an expected range of output. Support for the acceptance of this as a standard feature in future tests continues.

**Tractor Safety.**

Special remote control driving gear for test tractors enables the tractors to be safely driven at speed over calibrated obstacles without an operator in the seat.

Tests have been carried out on a device in the form of out-rigger wheels fitted to the tractor in order to prevent sideways roll over. Tests so far have been inconclusive.

They do, however, reveal a serious gap in the knowledge concerning the dynamic stability of tractors. The Committee proposes to continue the field testing of this device.

**Chain Saws.**

The Committee agreed to co-operate with the Commonwealth Forestry and Timber Bureau in the setting up of a suitable testing scheme for portable chain saws and their engines. The Bureau will conduct the sawing tests and prepare the test reports, including a section to be prepared by the Committee on engine performance and characteristics.