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PLANTS AND ASTHMA

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

ASTHMA is defined in the dictionary as being a disease characterised by recurring attacks of difficulty in breathing, and the causes are stated to include the inhalation of dust, or the odour of plants, flowers or animals. Hay fever is a similar condition and this too, is caused by plants, usually at the time of flowering, when large quantities of pollen are produced.

The great majority of plants are dependent on insects for the transport of pollen and the pollination of their flowers. A few plants, however, rely on wind currents for the transfer of pollen from one flower to the next, and in these species the pollen grains are light and sometimes winged, and are produced in vast quantities. These are the plants which are most often the cause of hay fever and asthma.

The native Sheoaks are species of this type and in the flowering season the male plants assume a distinct brown coloration with the masses of flower tassels at the ends of the branchlets. The native pines of the genus Callitris as well as the several species of Pinus cultivated in plantations are wind pollinated.

In a survey of the pollen load in the air carried out during 1947 by the Botany Department of the University of Western Australia in 11 of the suburbs of Perth, it was found that a little over half of the pollen collected was produced by pines and grasses. The effects of the clouds of pollen produced by pine plantations are well known in certain districts.

Among the grasses, the common couch is one of the most widely cultivated. It flowers regularly each year, and is a well known cause of hay fever. A great number of other grasses which share this distinction are widely naturalised in metropolitan and country districts. Prominent amongst these are the cereals; bents, bromes and fescues; barley grasses and rye grasses; paspalum and yorkshire fog. Maize with its large tassels of male flowers is a particularly prolific producer of pollen.

The widely naturalised sorrel and the equally abundant rib grass occur throughout the southern half of the State. Both are prolific pollen producers, and have been held responsible for attacks of hay fever. Other naturalised species include cape weed, which probably causes more trouble.
in the agricultural areas, particularly the south-west, than any other weed species. The daisy family as a whole is, in fact, a bad one for asthma and hay fever sufferers.

Chrysanthemums are widely used as cut flowers, but in many homes they never find a place because of the very serious effect they have on susceptible people. Sunflowers too, are capable of affecting the health of these people, and the giant flowered type is known to be capable of causing discomfort to occupants of houses on the opposite side of the street. Wormwood is an aromatic member of this group and one which is also known to be capable of causing trouble.

Privet, particularly the one which is grown for its abundant flowers, has been shown to cause hay fever under certain circumstances, but it is widely cultivated in gardens. Even the olive, cultivated over the centuries, has now been placed under a cloud by modern medical practice, and it too is suspected of causing hay fever. Again lucerne, the so-called “King of Fodder Plants” is suspect, as indeed is the lupin.

Most plants produce their effects only when in flower, but this is only partly true of some, as for example the silky oak. In susceptible people, asthma attacks can be induced by contact with the tree apparently at any time of the year, the mere act of climbing among its branches being sufficient to trigger off an immediate attack.

It is interesting to note that the same species of plant may cause different symptoms in persons of differing susceptibility. It is recorded that two youths who were assisting with the removal of a large and tangled plant of Tecoma from a suburban garden were both affected. One who had shown asthmatic tendencies on previous occasions quickly developed an attack, while the other became covered with a red rash.

The exact nature of these plant principles and their reaction with human beings is not clearly understood, nor, most probably, are all the responsible plants recognised as such. A great deal of work remains to be done in this field, and until then each case must be taken on its merits and investigated individually.

GOOD storage conditions are vitally important for retaining the germinating capacity of seeds.

Although the production of vegetable seed in Western Australia is limited, many local growers produce some seed of their own particular varieties and strains which are well adapted to the local environment. Stored on the property, these can soon lose viability if they are not properly treated.

Because seeds need a period of dormancy, the germinating capacity of seed of some vegetable varieties may increase during the first year of storage. This may be the case with cruciferous seeds such as cauliflowers, cabbage and swedes.

However, the viability of most of the vegetable seeds rather decreases than increases in storage. In particular parsnip and onion seeds lose their vitality quickly, and sometimes after two years of storage their germination capacity may be lost altogether.

In recent months a number of complaints have been received about weak and poor germination of seeds which have been stored, particularly the self grown seeds. It appears that many growers do not realise that several factors may affect the maintenance of viability of seeds in storage. Most important of these are:

1. Condition of the seed.
2. Moisture content.
3. Temperature.

The condition of the seed greatly depends on the conditions under which the seed is grown, harvested and cleaned. Weakening may result from unfavourable conditions during ripening on the plants or curing and cleaning after harvest, so the age of the seed from harvest is not
always a reliable measure of ability to withstand further storage.

Most growers know that some seeds are injured more by mechanical means of cleaning than by careful cleaning by hand, and this is particularly the case with broad-beans, runner beans and other large seeds.

It has been found that micro-organisms attack the seed at injured places, and injuries caused by threshing may be responsible for some loss of germination capacity during storage.

When storing vegetable seeds it should be borne in mind that seeds are largely made up of living material. Most seeds take up moisture quickly, or give it off to the atmosphere until equilibrium with the surrounding air is reached.

Increase of temperature or high moisture levels greatly increases the life activity of seed even though the moisture content is below that required for germination. As these activities take place in living material considerable amounts of energy are lost, with the result that the seed is gradually weakened and the germination capacity seriously reduced.

The speed at which life processes take place is low at low temperatures. It could be concluded that storage in a refrigerator is an obvious answer to preservation of the viability of seed.

However, although temperature can be controlled in this way, high moisture levels usually prevail and contaminating fungi may develop and cause injury to the seed. It has also been found that seeds removed from cool storage with high moisture content, then subjected to high summer temperatures, deteriorate so rapidly that in a few weeks the benefits of cool storage are lost.

Storage conditions are poor on many gardens. For example, high moisture levels may be induced by washing and packing of vegetables near where seed is stored.

The best storage for seed is in a cool, dry, well-ventilated place. Seeds packed in cloth, paper, or hessian bags should not be stored in lofts or close to roofs, as high summer temperatures and condensation water may cause deterioration. The possibility of damage by insects and rodents should not be overlooked.

Screw top jars or airtight containers are ideal for storage of small lots of seed. As low moisture content is important, it is recommended to dry the seed in thin layers in a well-ventilated place. The development of contaminating fungi may be prevented by dusting the seed with a commercial fungicide. The seed should then be placed in the containers and stored in a cool dry place.

A new development in preservation of viability is the introduction of vacuum packed seeds, and seeds packed in laminated tin foil.

With each method the newly harvested seed is cleaned and dried carefully to a standard moisture content after which it is placed in air and moisture proof containers and sealed under vacuum.

The advantage of vacuum packed seed over ordinary seed is the avoidance of moisture fluctuations.

At present a wide range of seeds is available, in either cans or laminated tin foil. There is also a wide choice of packs to suit the requirements of the grower.

Although this development has solved some of our storage problems, growers are reminded that the advantage of sealed storage is not retained unless the sealing of the pack remains unbroken.