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Non-parasitic diseases of potatoes

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POTATO tubers are subject to several non-parasitic diseases which are induced by unfavourable environmental conditions. These disorders often cause considerable loss of marketable tubers, but in some instances this can be avoided by correct cultural, handling, or storage methods.

The various non-parasitic diseases are described below, and where applicable, reference is made to suitable control measures.

BLACK HEART

Black Heart is a physiological disorder caused by lack of oxygen in the central tissues of the tuber. As a result, these tissues become asphyxiated and are found to be blackened when the tuber is cut (Fig. 1.)

The disorder frequently occurs in potatoes stored at excessively high temperatures or under conditions of poor ventilation. Losses from black heart can therefore be prevented by storing under cool, well ventilated conditions.

Fig. 1: A tuber affected with black heart
HOLLOW HEART

When environmental conditions induce very rapid growth, tubers sometimes develop a central cavity known as hollow heart (Fig. 2). This malformation, which is commoner in large tubers, may be prevented by reducing the planting distance between seed pieces in the next crop.

SCALD

Scald is a form of heat injury which frequently occurs when crops are dug under extremely hot conditions. Similar injuries also occur in tubers being transported during very hot weather. However, in this instance, the injury is usually confined to tubers close to the metal sides of the transport.

Scald may first appear as slightly bleached spots with irregular margins of a dark metallic colour (Fig. 3) or as large blisters. When cut, the affected tissues are found to be soft, watery and slightly discoloured. This discoloration is usually grey at first, but later becomes black.

Losses from scald may be reduced considerably by picking up tubers immediately after digging if harvesting is done during hot weather, and also by exercising greater care when transporting potatoes.

SECONDARY GROWTH

Secondary growth is a knob-like tuber defect, which commonly occurs when seasonal conditions cause fluctuations in the rate of tuber growth.

Dry weather normally stops tuber development, but the subsequent onset of wet conditions may bring about an abnormal growth response. This results in knob-like outgrowths being formed on tubers (Fig. 4).

GROWTH CRACKS

Deep fissures known as growth cracks are sometimes formed in the surfaces of tubers in association with symptoms of secondary growth (Fig. 5). Such defects indicate that a check in growth has been followed by a sudden renewal with consequent cracking of the hardened skin.

Fig. 2: Part of a tuber showing hollow heart

Fig. 3: Scald. Note the dark margin of the scalded area
ENLARGED LENTICELS
The lenticels are normally inconspicuous, but may greatly enlarge and protrude on tubers in heavy wet soils. At first the protruding tissues are soft and white (Fig. 6) but later become brown and corky. The condition is of little importance, although sometimes such lenticels provide an easy entrance for disease organisms.

WATER LOGGING
Tubers from crops which have been under water for several days develop symptoms of water logging. On exposure to air the flesh of these tubers becomes a greyish white and readily yields water when subjected to pressure. Such tubers eventually break down to a mushy state.

BROWN FLECK
The cause of brown fleck is still obscure, but the condition is known to occur more commonly on light soils and when high temperatures dry the soils. Affected tubers appear normal externally, but when cut, are found to have numbers of brown flecks, blotches or streaks, scattered throughout the flesh (Fig. 7.)

Although the condition renders tubers unfit for consumption, crops grown from flecked seed on different soil types, may be free from the disorder.

SPINDLING SPROUT
Spindling sprout or thready-eye is a tuber condition characterised by the development of very weak, slender shoots (Fig. 8.)

The disorder occurs commonly in tubers maturing in hot soils such as swamp border ground, and there is evidence that it may be induced by the over-heating of tubers. However, this is not the only cause, as identical symptoms of thready-eye may be produced by the parasitic virus disease known as leaf roll.
Thready-eye tubers always produce weak unthrifty plants and therefore should not be used for seed.

**GREENING**

Greening occurs in tubers exposed to sunlight either in the field or in open storage after harvest. Such tubers have a bitter taste and should not be eaten, owing to the production of a poisonous substance, known as solanin, in the tissues.

Potatoes harvested for food should not be exposed to light any longer than is necessary and should always be stored under cool dark conditions.
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