

**COIX GIGANTEA (LINN.)—WILD ADLAY**  
**A PERNICIOUS PADDY FIELD WEED**

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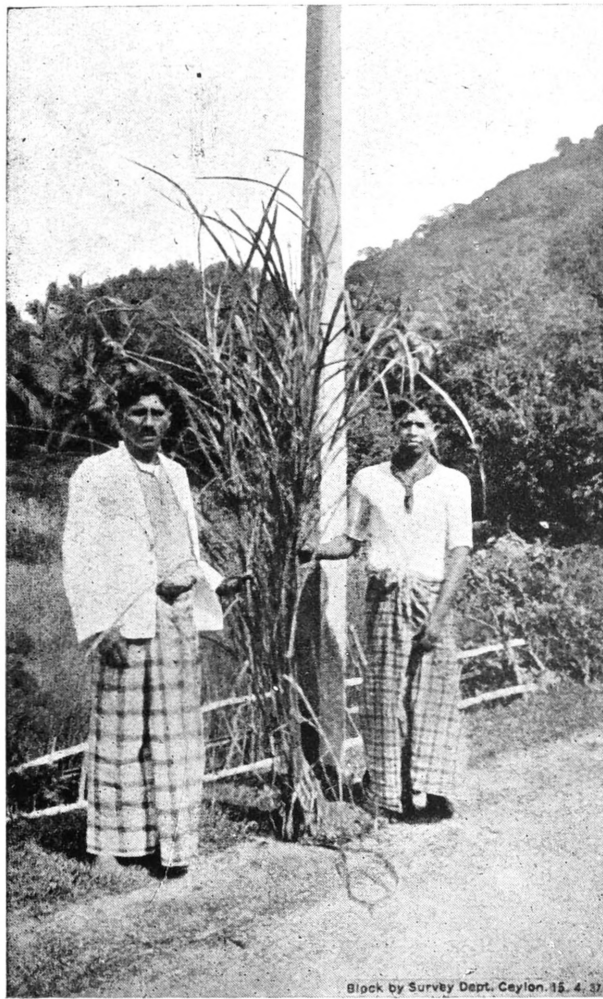
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WEEDS IN RELATION TO AGRICULTURE

THE successful cultivation of any crop depends on the issue of a battle waged between the crop and various foes both visible and invisible. Pests and diseases in any form are debilitating and destructive to cultivated crops. Climatic and weather conditions, though they sometimes prove hostile, are not within the power of the farmer to bring under subjugation, but by due application, pests and diseases can be brought under control or fully exterminated. Not the least of a farmer's enemies are weeds, which add enormously to the cost of crop production. Although weeds are responsible for nearly halving the yields of many crops, yet adequate attention is not paid in most countries to their control. According to a report by the Agricultural Service Department Committee of the United States Chamber of Commerce, annual losses from weeds considerably exceeds the combined losses sustained from animal and plant diseases and the depredations of insects, rodents and predatory animals. The rank growth of weeds invariably found in paddy fields is largely responsible for the low yields obtained from paddy, the most important food crop of the indigenous population in Ceylon. In the field, weeds set up an incessant competition with the main crop for plant food, light and water. Weeds, especially graminaceous herbs, very often harbour insect pests and diseases inimical to paddy and also add to the cost of labour.

According to the writer's experience the effect of *Coix gigantea* in paddy crops is greater than the combined damage done by all other paddy field weeds. *Coix*, being a cereal, demands the same kind of plant food as is required by paddy



Block by Survey Dept. Ceylon. 15. 4. 37

A full-grown wild Adlay plant in seed



Wild Adlay standing erect, whereas the paddy crop has lodged heavily



A paddy field overrun with wild Adlay

and, in the struggle for food absorption, the paddy crop is greatly handicapped, owing to its poorer root-system. The writer first noticed this weed in the Kegalle range but, on further investigation, found that it existed in large areas in the North-Western Division and South-Western Division. Many paddy fields in Kegalle have been gradually caught in the grip of this pestilential weed, and a close survey of the areas, combined with collated evidence, indicates that the weed started spreading from the Kurunegala and Negombo Districts towards the Kegalle District. Like tares of biblical fame, *Coix* is used by many villagers as a means to punish a fellow villager, by throwing a handful of the seed into his paddy field, with the happy knowledge that it will multiply through generations, ultimately throwing the field out of cultivation.

#### DESCRIPTION

*Coix gigantea* is a very hardy, graminaceous annual or perennial herb of the tribe Andropogoneae and sub-tribe Maydeas and is a wild form of the edible cereal, adlay, *Coix lachryma-Jobi*, commonly known as Job's tears. Unlike adlay which grows to about 3 to 6 feet in height, this wild species is tall, often reaching 10 feet or more. It is more robust than adlay on reaching maturity becomes very woody, the lower nodes often measuring half inch or more in diameter. It stands ratooning like the cultivated species. Its leaves are longer and narrower than adlay, bright green and taper from a broad base to an acuminate tip, with serrulate margins. In bright sunshine, the glossy leaves contrast sharply with the dull leaves of paddy. Like adlay, *Coix gigantea* is monoecious. The speciform terminal or axillary racemes are sparsely branched, and are longer and more drooping than those of adlay; each raceme consists of a female spikelet at the base, surmounted by a series of male spikelets, usually 3-nate at each node. The female spikelet or fruit or seed as it is often called, is enclosed in a broadly ovoid, acuminate, stony bract, which on ripening becomes hardened, highly polished and nut-like, and has a colour ranging from grey to pale brown to mottled chocolate.

The fruits keep very well and are often used in making rosaries, ornamental trays, baskets, boxes and bead-curtains.

The enclosed grains can be fed to poultry after crushing the fruits. The stems, normally tinted reddish brown, are freely branching, very stout, smooth and polished, and root at the lower nodes. Wild adlay does not tiller so freely as the cultivated species, produces fewer female spikelets and possesses a more vigorous root-system. Specimens removed from cultivated paddy fields had a more efficient root-system than surrounding paddy plants, the feeding range being much wider, spreading as it did from  $1\frac{1}{2}$  feet to 2 feet. Examination of the root-system revealed that there were clearly two types of roots—a slender fibrous type, densely covered with absorbing capillaries, originating from the base of the plant and long, cylindrical roots radiating from the base and lower nodes. The roots arising from the upper nodes act as props to the plants in assisting them to withstand the force of flowing water or wind, while the less adapted paddy lodges heavily under such environmental conditions. The submerged parts of the roots are spongy and pithy serving perhaps as breathing organs. Wild adlay growing on dry land does not possess this characteristic.

#### CONTROL AND ERADICATION

It is of paramount importance, in the interest of paddy cultivation in Ceylon, to arouse concerted action in the control and eradication of this weed, as its spread is becoming general and its effect in the reduction of crop yields is considerable. Several fields have been seen in which this weed so predominated over the paddy crop, that the cultivators gave up harvesting the crop altogether. In badly infested areas paddy plants bear few grains and the expenditure in harvesting is greatly increased, as selective reaping has to be resorted to—in itself is a laborious task.

It was noted that wild adlay needs 5 to 6 months to flower and seed and hence it matures only during the *maha* season—when long-age paddies are sown in these fields. Although it grows with short-age paddies when sown during *yala*, it has no time to reach maturity, flower and seed and the plants are harvested with paddy crops before seeding. Seeds start sprouting the fields about 3 to 4 days after the paddy crop is sown and at a time when the field is devoid of free water and when the mud is warmed by direct solar heat.

Field observation and pot experiments revealed the fact that when fully submerged under water, wild adlay seeds do not germinate and, in adopting any control measures, this behaviour of the seeds should be taken into consideration. Viability of the seed is very great, so that seeds may remain dormant underground for considerable periods to germinate as soon as suitable conditions arise. The seeds are heavy and sink in water but are nevertheless transported by running water in channels and by overflowing flood water. Rabbing or burning the paddy stubble tends to increase rather than decrease the germination of seeds and it is suggested that the scorching of the stony, hard coat of the seed permits the more easy penetration of water.

When the life history and peculiarities of this plant are considered, it will be realized that if it is to be successfully controlled it requires both communal and individual effort. The campaign should be well organised with a definite programme for attaining the object in view. The measures adopted should be persistently and faithfully executed for several years.

The following control and eradication measures are suggested :—

1. Whenever possible paddy should be grown in both seasons.

2. Transplanting the crop during *maha*. This will give an opportunity to select clean, weed-free seedlings from the nurseries for transplanting. At the same time the rest of the field should be prepared in the ordinary way and left unsown so that the weed when it germinates and grows to an appreciable size can be rooted out and destroyed, or the whole field ploughed up burying the weed seedlings, which could be rotted by flooding. The sprouted seedlings can also be killed by keeping them fully submerged under water for about a fortnight.

3. Fields that cannot be sown during *yala*, for want of sufficient irrigation water should be brought under vegetable cultivation, when the wild adlay seedlings can be easily removed as they appear.

4. Flooding the paddy field as soon as paddy seedlings can tolerate a stand of water ; such a treatment will prevent

the seed from sprouting and if already sprouted, will kill them if they are kept submerged for a considerable period.

5. Cutting out the weed, when it has reached an appreciable size and flooding the field to kill out the root-stock. The green material can be fed to cattle.

6. Thorough weeding.

7. Use of clean seed.

8. The collection and destruction of seeds that have dropped before or during harvesting.

9. Removal of the weed if found growing on highland in the neighbourhood of paddy fields.

10. If other methods fail, the short-age paddies may be grown during both *maha* and *yala* seasons to prevent the weed from seeding.

#### DIFFICULTIES ENCOUNTERED IN THE CONTROL OF WILD ADLAY

1. Owing to the close similarity of wild adlay seedlings with paddy seedlings the plants are overlooked and left behind during the process of weeding.

2. Owing to the strong root-system, seedlings may break away during weeding operations, leaving the root-stock behind to shoot out again.

3. Flowering and seeding of wild adlay often coincides with that of the paddy crop and most of the seeds drop off before or at the time of harvest. In consequence the weed multiplies very rapidly.

4. No cultivator can be induced to enter the paddy field and handle the weed, once the paddy has advanced in growth.

5. Owing to their great viability, seeds remain dormant for a long period, till favourable conditions appear for germination.

6. Malicious introduction of seed to paddy fields through human agency.

7. Control measure (No. 5) cannot successfully be carried out in paddy fields infested with land crabs, since, as soon as the paddy fields are flooded, crabs become more active and large numbers of paddy seedlings are eaten and destroyed by them.

8. The system of tenancy cultivation, by which cultivators are changed from season to season, militates against conscientious application, hence continuity in control methods is the exception rather than the rule.