THE WATER HYACINTH PEST.

W. C. LESTER-SMITH, B.A.,
Plant Pest Inspector, Southern Division.

Department of Agriculture, Ceylon, Leaflet No. 40.

INTRODUCTORY.

The Water Hyacinth (*Eichornia crassipes* Solms.) or " Lilac Devil " is a water-plant native of Brazil which was introduced into Ceylon about 1905. It has now become naturalized and is a serious and menacing weed in the Southern Province. Its habitat is in swamps, lagoons, tanks, irrigation channels, drains, the slowly flowing parts of rivers, pools, and other similar places where there is enough water during part of the year for the plant to grow. It will float and thrive in water of any depth, provided that the current is sluggish enough. It will also grow and thrive as a land plant in places where there is little or no visible water but where its roots are more or less continuously kept moist. Its adaption to such conditions and its ability to survive short periods of drought render it all the more difficult to eradicate. The plant is a declared weed and its importation and cultivation in Ceylon are prohibited by legislative measures.

VERNACULAR NAMES.

In the Southern Province generally the plant is known to the Sinhalese as " Japan Jabara," and to some simply as " Jabara " which latter name has also a number of local variants, such as " Yabara," " Yapura," " Sabara," and "Habara" or "Habarala." In 1914 it was known in the Tangalla District as " Japan Yabara," in the Kadugannawa District in 1916 as " Diya-Kehel," and in 1917 the name " Diya-Manel " was recorded for it in the Polgahawela district.

REASONS FOR WHICH THE PLANT IS A DECLARED PEST.

For many reasons this plant should not be allowed to grow freely. The primary ones, and those which should appeal most strongly to all, are intimately concerned with the cultivation of paddy. Once the Water Hyacinth becomes established as a common paddy-field weed, it is inevitable that it will cause an increasing reduction in yield year after year. Other damage occurs owing to the choking up, by its rapid growth, of irrigation channels and watercourses. In infested areas these channels may be completely blocked up, causing a serious reduction in the flow of water either into or out of the paddy-fields at times when such is undersirable. If this occurs to any appreciable extent it may result in the failure of the crop, due either to a lack or to an excess of water at a critical period in its growth. This factor of the control of water is one of the most important in the cultivation of paddy, and the infestation of watercourses by this water-weed may remove all possibility of such control. In view of the desirability of increasing both the yield of and the acreage under paddy in Ceylon strenuous efforts should be made to eradicate the Water Hyacinth. Further reasons unconnected with paddy cultivation can also be advanced in favour of its eradication. Of these the chief are perhaps on the grounds of health and sanitation. The effect on health of such vegetation growing in ditches and watercourses, especially when these are in the neighbourhood of houses and villages, cannot be other

than detrimental. There is no doubt that its presence in some areas causes water stagnation. In this way the Water Hyacinth is an indirect source of danger through the encouragement it offers for the breeding of mosquitos and other disease-carrying insects. In some places, also, it may seriously interfere with sewage disposal. By such means the Water Hyacinth can render infested neighbourhoods feverish and insanitary.

METHODS OF ERADICATION.

The following approved methods for dealing with the Water Hyacinth are herewith set out. All Water Hyacinth plants must be pulled out from the places where they are growing and piled up on some adjoining or near-by high ground for proper disposal. Further, it must be noted that one clearing will not suffice and that at least two clearings and probably more, with short intervals of a week or ten days between each, are necessary. This is because a certain number of the plants (or parts of the plant) which can go on growing, are either missed, dropped, or develop after each primary clearing. One of the two following methods of disposal must then be proceeded with: the plants must be dried in heaps and subsequently all burnt with fire, this method will be found most practicable in the drier parts of the Island; or alternatively, the plants must be rotted in pits dug in the ground in preparation for this purpose, this method will be found to be of general application. The pits when full should be covered with a layer of earth or sand. If the pit method of disposal be adopted it is recommended that a little quicklime be thrown in with the plants to accelerate decomposition. The eradication of the Water Hyacinth cannot be effected in one season, it is a task requiring much patience, but it is one that must be very carefully and regularly attended to. The individual attention of owners to the work is recommended, and for the clearing of adjoining infested areas both co-operation and continuity in the work are essential for success.

DESCRIPTION OF THE PLANT.

The Water Hyacinth is a small, herbacious, perennial, water-loving plant. It rarely if ever exceeds three feet in height from the ground or water level. It grows with its vegetative parts (*i.e.*, leaves and flowers) floating on the surface of the water, if deep enough, and with its roots submerged (but not rooted) and serving to maintain the equilibrium of the plant. If the water is shallow, or in moist places, it grows with its roots in the mud but not penetrating the soil to any extent. The roots are thin and wire-like. They are feathery in appearance on account of the almost regular outgrowth of numerous short secondary rootlets. The extent of the root development depends largely upon the age of the plant, the depth of the water, and the amount of congestion due to the proximity of other plants. In mature plants the primary roots may vary from about six inches to over two feet in length. Sometimes the reduced and almost inconspicuous stem, which is often hidden by the junction of the leafstalks, becomes enlarged into a stout fleshy rhizome. From the base of the plant and from this rhizome often arise one or more stolons (or runners) which serve as the chief means of vegetative reproduction. The thick, fleshy, ovoid or elliptically shaped leaves, when the plants are free floating, serve as sails and with the wind aid in the dispersal of the plant by water to new areas. The smooth, round,

petioles (or leafstalks) thicken gradually toward the base. In the case of mature plants floating individually in deep water and young plants in shallow water, the leafstalks develop into characteristic bladder-like or spindle-shaped expansions just above their junction to the stem at the base of the plant. The inflorescence, which is usually elevated an inch or two above the leaves, consists of a flower stalk, with several wavy margined sheaths (bracts) at and above the middle, and terminates in a simple spike, bearing from six to twenty iris-like flowers. Each of these mauve or pale lilac flowers consists of six parts which join below the spread out part to form a funnel-shaped base where the flower joins the flower stalk. The upper one of these six parts differs from the rest by being larger and possessing a large patch of blue with a pear-shaped spot of bright yellow in the centre. The six stamens are attached to the funnel-shaped tube at different heights, three being long and three being short. The style is slender with a terminal stigma. The inflorescence is of short duration lasting only about a day after which the flower stalk bends slowly over and carries with it the withered flowers which do not fall off. Seeds have not been found to be regularly produced. When they are, their germination is dependent upon the presence of water preceded by some desiccatory influence, such as a thorough drying out caused by a short period of drought. The usual means of reproduction are vegetative—generally by means of runners, but occasionally by the detachment of a vegetative bud possessing roots and shoots.

CO-OPERATION AND NOTIFICATION.

The cleaning of infested areas belonging to the Crown has already been commenced. In some areas this work must go hand in hand with the clearing of privately-owned infested areas. For the purpose of co-operation in this work the Department of Agriculture will take the initiative and inform the owners concerned the dates on which the work should commence. Further, as it is most desirable that no infested areas be overlooked, it is hoped that persons will notify the Agricultural Department of any infested areas which come to their notice. It is sincerely to be hoped that all will co-operate to the full in the efforts being made to free Ceylon of this pest.

INOCULATION EXPERIMENTS IN RELATION TO "SUN-SCORCH" ON EXPOSED LATERAL ROOTS OF *HEVEA BRASILIENSIS*.

F. S. WARD, B.S.A., (McGill).,

Assistant Mycologist, Department of Agriculture, S. S. & F. M. S.

Numerous experiments have recently been carried out with the view of artificially approximating the conditions bringing about the occurrence of " Sun-Scorch " on the exposed lateral roots of *Hevea brasiliensis*.

The first impression of this outbreak of ". Sun-Scorch " was, that the blackened condition of the upper surfaces of the roots was caused by some form of burning. The origin of such scorching effects may be due to several causes such as "leaf fires" or "lightning strike;" in this case, however, these possible causes have upon further investigation been eliminated. It