

The World Wide Distribution Of The Water Hyacinth

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Many people toiling to clear water hyacinth from the lakes and waterways in their country may feel that they are particularly unlucky in having to fight such a persistent and expensive weed, without fully realizing what an international pest the plant has become.

But anyone interested in plants who travels widely will soon see that there are few tropical or subtropical countries in the world which are free from invasion by water hyacinths. Where the conditions are right the infestations are so large and spectacular that they get into the news. Yet even from these accounts it is hard to appreciate the extraordinary capacity the plant has to cover such wide tracts of water and in the process virtually to eliminate every competitor.

In a recent series of journeys I have had the chance to visit a number of tropical countries with the object, among other things, to find out as much as possible about hyacinth distribution.

Some countries have had little resources other than hand labour to make any attack on hyacinth invasions and therefore have allowed the spread of the weed to take its course. Some countries, on the other hand, like New Zealand, recognized the danger of their hyacinth infestation while it was still relatively small and have been vigorously carrying out an eradication programme; but in this case fifteen years of work has still not eliminated the plant.

The U. S. A. allowed its infestations in Louisiana and Florida to grow to massive populations before bringing its great resources against it. Enormous effort and expense has reduced hyacinth populations in many areas to reasonable proportions but complete eradication appears to be unlikely within the foreseeable future.

On the Nile tremendous amounts of hyacinth threatened the navigation of the river and the irrigation schemes so important to the Sudan. In order just to keep the infestation at a manageable level and to prevent further spread, the authorities have to employ constantly about 200 men with aircraft, boats and other spraying equipment together with large amounts of herbicide at a total annual cost of about \$1.5 million.¹

The other great river infested by hyacinth is the Congo. Vast areas are densely packed with the weed causing navigation difficulties and seriously hampering local fishing. Between 1956-1957, 50 million Belgian francs were spent on attempts at control but in 1959 an estimated 150 tons of the weed drifted past Leopoldville every hour (2). In 1964 quantities of weed equal to or even more than this were drifting by. I was told that the situation on the river was as bad as if no money had ever been spent on control. Little if any work can be done now under the present political conditions and thus the hyacinth can develop and spread unhindered.

Hyacinth fills thousands of kilometers of channels in Egypt. Apart from the trouble it causes directly it is believed to shelter the snail which causes the serious disease of bilharzia.

Hyacinth is known on the E. African seaboard, but as yet, West Africa is free — with one exception, Senegal. Plants have been introduced into this country allegedly from the Congo to sell as ornamentals. This introduction is being attacked by the authorities, but in late 1964 it was dismaying to see hyacinth plants still growing in a pond in a public garden in Dakar.

Hyacinth in Senegal and the vast quantities constantly pouring down the Congo, threaten the great rivers of West Africa from the Gambia past the Volta river to the Niger.

In Asia hyacinth is to be found in profusion. In Assam and West Bengal in India, in E. Pakistan, in Burma, Thailand, Malaya and the Philippines, and I expect in every other country of S. E. Asia, hyacinth can be seen choking ponds and streams. Poor people in these countries can and do make use of the plant to feed their animals, or as a source of mulch or compost for their land, but the pest remains the usual menace to shipping and fishing.

Hyacinth is in Australia where, as in New Zealand, vigorous efforts to exterminate it are in progress. It also causes trouble in many of the Pacific Islands.

In South America hyacinth is abundant. In British Guiana it is an important component of weeds which block the transport canals in the sugar estates. It has been reported in Surinam and is no doubt to be found in many other places in S. America as this is its country of origin.

In the Caribbean hyacinth can be found in many islands. There is plenty in Puerto Rico. In Jamaica the infestations are as yet not large but there is anxiety that they may spread into new hydroelectric lakes.

In Costa Rica the weed is probably well established though the only plants I saw were in an ornamental pond at the International Airport.

Nicaragua has a serious hyacinth infestation on the new hydroelectric project on Lake Apanas. Unless vigorous action is taken it seems likely that the weed will soon cover most of the lake surface.

In El Salvador hyacinth has been present for several years on the hydro-electric lake formed on the Rio Lempa. While it is present in great quantity the authorities concerned have not, so far, found it necessary to take action against it. This probably is partly due to the lake periodically flushing large quantities of the weed over the dam spillway into the sea.

Mexico has hyacinth well distributed over the country but as yet it has not made any significant appearance on new lakes.

The water hyacinth is a formidable enemy of millions of people who live in warm climates. The beauty of the plant's flowers which has resulted in its deliberate introduction to so many countries still poses a threat to those still, fortunately, uninfested.

Those countries still relatively lightly infested would be well advised to learn from others and strive to attempt eradication while the areas to be treated are small enough to be within their resources. Any plan of campaign ought to be almost on a military footing and provide for several years of careful and detailed work. This is because no one knows yet how long it takes for all hyacinth seeds to die, or to germinate so that they can be killed. Thus once an infestation has flowered freely constant inspection and retreatment of new seedlings is likely to be needed for an indefinite period. All further flowering must of course be prevented. At the

same time strict quarantine and public education into the dangers of the plant seem to be essential if further spread, or reinfestation, over all the warm areas of the world, where water supplies are important, is to be avoided.

At the same time more research is needed, research which should, if possible, be on an international scale so that reliable recommendations can be derived to meet widely differing technical and administrative situations.

It is necessary to know in economic terms how important a pest hyacinth is, or is potentially likely to become, in a given situation. From this information it should be possible to judge how much money is worth spending on controlling it or in attempting to exterminate it. For example, in hydroelectric lakes the stored water can be given a value in terms of the electricity it can generate. How does an infestation of hyacinth affect this storage by displacement of water and by promoting water loss by evapo-transpiration? In spite of the many lakes infested with hyacinth and other weeds there is little, if any, information on this point. Water used for irrigation again has a value though it is more difficult to estimate it. If irrigation ditches are blocked by hyacinth what does this cost the grower in terms of slower delivery of water and greater evaporation loss?

Though only one species of hyacinth, *Eichhornia crassipes*, has the characteristics which make it an international pest yet its growth and development vary widely in different places even under apparently similar conditions. Why is the plant stunted in some places and luxuriant in others? When such differences in growth are observed it seems probable that some biological effect is at work, though nothing of this type has been reported. A good example of this was shown in 1960-62 in Rangoon, Burma, on the small Inya Lake. Hyacinth infestations were growing with typical vigour in channels round the margin and plants periodically broke off and were blown into the lake by the wind. Yet for no obvious reason, the plants never multiplied and the lake remained clear of hyacinth in spite of apparently favourable conditions.

Where large infestations have to be cleared quickly and economically, then spraying with herbicides is usually the easiest and cheapest method. But while there is considerable information available as to the effectiveness of the herbicide 2,4-D, against hyacinth, there are still many important situations where herbicide recommendations cannot be made with confidence. For example, when hyacinth is growing close to highly susceptible crops, like cotton, 2,4-D is not safe to use. When hyacinth is mixed with floating grasses, which are not effected by 2,4-D but which also must be eliminated, what is the best alternative herbicide to use? Very little experimental data is available on which confident recommendations can be made.

Though 2,4-D is a relatively cheap herbicide it is still too expensive for large scale use by many countries at the generally recommended rate against water hyacinth of 4 lb./acre. Detailed research may discover ways of making 2,4-D effective at lower doses.

An idea which appeals to everyone, especially to countries with limited resources, is the possible use of biological control methods because these seem to offer the only way by which the pest can be removed at relatively low cost. Water weed eating manatees, snails, and herbivorous fish all have their supporters. These animals all show promise but are only likely to be effective after a great deal of research preferably on an international basis, has been carried out to discover how to prevent losses by predators. Unless this is achieved



OFFICERS 1965 - 1966 — Seated, left to right: James D. Gorman, Zeb C. Grant, John W. Woods, Standing, left to right: Lyle W. Weldon, William E. Wunderlick, Robert D. Blackburn, John E. Gallagher.



OFFICERS 1964 - 1965—Seated, left to right: James D. Gorman, John W. Woods, Herbert J. Friedman. Standing, left to right: T. Wayne Miller, Jr., Zeb C. Grant, Robert D. Blackburn, A. C. White.