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AQUATIC WEEDS

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Introduction

When man was a hunter-gatherer there were no such plants called weed. The concept of weed was introduced with the begining of agricultrue. When man first started growing plants he came across with certain plants which interfered with his crops. These plants, he considered as weeds. With the increase in complexicity of his life new and insidious weed situations arose.

It is very difficult to define the term weed because neither a single plant could be considered as all bad nor all good. The most convenient definition of a weed is "a plant growing where it is not wanted" (Roberts *et al.* 1982). With this definition an aquatic weed could be described as an unwanted plant growing in a water body.

Therefore, a plant having some use may turn into a weed when its presence becomes troublesome. For example, a Hydrilla plant (Diya-Sarpa) in an aquarium has an aesthetic value. But when it grows vigorously and choke water ways, it is considered as a weed. Hence, "weediness" of a plant depends on the way man looks at it.

Classification

Aquatic weeds could be classified in the same way as other aquatic plants.

i. Amphibious plants: These plants can grow in the presence as well as in the absence of water.
e.g. *Cyperus* sp. (Pan)
Alternanthera sp. (Mukunuwenna)

ii. Submerged plants: This group includes three types of plants.

a. Rooted plants with floating and/or aerial leaves.
e.g. *Nymphaea sp.* (Olu, Manel)
Limnanthemum sp. (Hin-andala, Maha-andala)
b. Rooted plants with submerged leaves.
e.g. *Blyxa* (Diya-hawariya)
Vallisneria (Patta-tana)
c. Submerged free floating plants
e.g. *Hydrilla* (Diya-Sarpa)
Utricularia (Nil-monaressa)

iii. Plants freely floating on water surface
e.g. *Pistia* (Diya-gowa)
Eichhornia (Japan-jabara)
Salvinia (Japan-pasi)
Azolla

In Sri Lanka, *Pistia stratiotes, Eichhornia crassipes, Salvinia melastoma, Azolla and Hydrilla* are common aquatic weeds.

Special Characteristics of Aquatic Weeds

Weeds possess special characters that are responsible for their wide spread and troublesome occurance. Usually these plants could establish themselves easily. They also show efficient reproductive methods. They produce seeds in masses. Colonization by means of vegetative structures such as rhizomes, runners, offsets, stolons and by fragmentation are very common.

Furthermore, they show adaptations to their special habitat which is water. Numerous air spaces in their tissues help the weeds to float on water.

Since exchange of material occurs through the epidermis, there is no need to have a well developed root system or a vascular system. To facilitate

exchange of material, submerged parts do not have a cuticle. Such parts do not have stomato too.

As mentioned earlier, some aquatic plants lack roots. Some rooted plants have them for anchorage while some others have them for buoyancy.

Problems Caused by Aquatic Weeds

Due to their rapid growth and efficient regeneration methods some aquatic plants spread widely and become a nuisance. In Sri Lanka this problem is aggravated by the favourable tropical climate.

These plants grow rapidly and cover the water surface resulting many agricultural and irrigational problems.

Aquatic weeds choke lakes, irrigational and drainage canals. They block water regulating structures and irrigational equipments too.

They also bring about undesirable flavours, ordours in water together with other health hazards such as providing breeding grounds for mosquitoes.

Increased surface area due to leaves increases loss of water by evapotranspiration.

Reduced velocity of water flow increases siltation and reduces carrying capacity of water bodies. High water levels in canals result in flooding, seepage loses, breaking of canal banks and causes inadequate delivery of water to farms located at a distance from the main canal. This leads to the need of more frequent dredging.

They also interfere with fishing, swimming, boating and navigation in lakes and waterways.

Beneficial Effects

As mentioned earlier these plants are not always problematic. In some ways they are useful to man.

When grown along shore lines and canal banks they reduce erosion.

Some plants provide food and protection for fish and fowl. In addition certain plants are used by man for food and medicine.

In aquaria some of these plants are used as ornamentals.

Some of the aquatic weeds are under experimentation to utilize their beneficial effects for various purposes.

E. crassipes is found to remove wastes from polluted water. Then the plant could be used for the production of bio gas, paper, ink, and fertilizer.

Azolla which has a symbiotic relationship with the nitrogen fixing blue green bacterium Anabaena is tested to be used as a fertilizer for nitrogen poor soil.

Control and Eradication

The best way to protect water bodies from weeds is to prevent initial introduction. This could be attempted by plant quaratine laws.

Eradication of a plant implies elimination of that species from the natural region or drainage basin. This is costly and may not be economically practical.

The control of a plant means the reduction of the area it covers so that it does not offer a serious problem when duly controlled.

Control of aquatic weeds could be done in several ways. Proper construction of ponds so that as much water as possible is at least two feet deep is one way of controlling rooted aquatic weeds, which are not easily established in deep water. Pasturing, mowing, hand cleaning and burning could be used to control amphibious weeds that grow in ditchbanks. Drying is a simple way to control many submerged aquatics. For rooted aquatic plants dredging and chaining are effective.

Another way of controlling weeds is by using herbicides. For this a thorough knowledge of biology of weeds that are to be treated, appropriate

chemicals, recomended rates, time of treatment and amount of water or area which has to be treated should be known.

The control of submerged aquatics in bodies of water that are used for fishing and other forms of recreation presents one of the most difficult problems in the entire field of weed control, because safety of persons using these facilities as well as of the fish and other wild life is most important.

Biological control of weeds, the control or suppression of weeds by the action of one or more organisms accomplished either naturally or by the manipulation of the weed, control organism or the enviroment is the third way of controlling aquatic weeds. Control of *Salvinia melastoma* by the insect *Cyrotobagous singularis* is an example comming from Sri Lanka.

References

DE THABREW, W.H., DE THABREW, W.V., (1983), Water Plants of Sri Lanka, Suhada Press, England.

KLINGMAN, GLEN C., (1966), Weed Control : As a Science, (ed. by Noordhoff, Lyman J.) John Wiley & Sons., Inc., New York, 321-346.

ROBERTS, H.A., CHANCELLOR, R.J. & HILL, T.A., (1982). The Biology of Weeds, In Weed Control Hand Book-[Principles (ed)] H.A. Roberts :1,36.

SANGAKKARA, U.R., (1984), Weeds-Their Effects on Productivity.
In Symposium on Weeds and Weedicides, SLAAS, Sri Lanka.