Eco Survival

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BOOK SAGA

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Review Of Literature on Weeds, Aquatic Weeds, and Their Sustainable Management

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Abstract

Plants are valuable assets without which one could not survive on the earth. But we can not afford weeds to grow indiscriminately all over the land and water bodies, else a place for us and our activities will be challenging to find. The utilization of weeds for human betterment is one of the methods of managing weeds. Still, it needs extensive work in every field concerned with human, animal husbandry, industry, pharmacy, etc. A review of relevant literature was carried out for further use.

Keywords. Weeds, Aquatic weeds, Sustainable management

Introduction

Weeds: Weeds are not strangers to man. They have been there ever since man started cultivation of crops about 10,000 B.C. and were undoubtedly recognized as a problem from time to time.

Weeds are not a problem only in recent years but were alluded to in the parables of Jesus Christ (St. Matthew, Chapter 13), and hence even 2,000 years ago, they must have been very much in people's minds. He referred to the deleterious effects of weeds in two ways:

1. In the parable of the sower, they check and reduce the yield of the crops and
2. The crop itself is disturbed and its growth impaired when weeds are not removed from the crops.

Weeds and their Management

Plants are valuable assets without which one could not survive on the earth. But we can not allow weeds to grow indiscriminately all over the land and water bodies, else a place for us and our activities will be challenging to find. Of the more than 3,00,000 species of plants known globally, hardly 3,000 are of economic value to us. When one grows any of these economic species of plants, a variety of volunteer vegetation invariably comes up simultaneously, which is competitive and undesirable. Besides, several plants are unwanted because either they are responsible for many human and animal health hazards, or they hamper the activities of humans in one or other way. Such plants are termed weeds.

A weed is a plant growing where it is not desired. A plant could be undesirable at one place and desirable, or of little concern, at the other. Bermudagrass (*Cynodon dactylon*), foxtail (*Cenchrus ciliaris*), and goose grass (*Eleusine indica*), for instance, are valuable plants in pastures, but in crop fields, these are well known troublesome weeds. Likewise, quack grass (*Agropyron repens*) is an excellent soil binder on certain erodable lands, but it is a tough weed of arable crop fields and orchards. Prickly pear (*Opuntia elatior*) is an effective biological fence plant and a valuable plant in deserts to hold the sand. But in pastures and rangelands of many countries, including India, it has become a very aggressive weed on millions of hectares.

Water lily (*Nymphaea* sp.), Lotus (*Nelumbo* sp.), and Water nut (*Trapa natans*) are amongst the most troublesome aquatic weeds. Yet, these are cultivated in specific water bodies for their economic uses as ornamental or edible fruit plants. Even the self-sown crop plants like Jowar and Soybean growing in patches in some other crops, e.g. Cotton and Sugarcane, are to be considered weeds.

Aquatic Systems and Weeds

Aquatic weeds and weeds growing along water courses reduce water flow, irrigation, drainage, and streams. This results in high water levels in canals, flooding, and seepage. In addition, the reduced velocity of flow causes an increase in siltation and reduced carrying capacity of water bodies. Weeds cause enormous loss of water through transpiration. Such water bodies form breeding grounds for public health insects and emit undesirable odours and tastes in the public water supply. They also reduce recreational values by interfering with fishing, swimming, boating, navigation, water sports and causes allergic reactions to human and animals. Some prominent aquatic weeds are *Eichhornia crassipes, Typha augustata, Hydrilla verticillata, Potomogeton, Salvinia moleata, Ipomea aquatic, Nymphea*, etc.

Holm *et al.* (1991) reported that, in Chambal Project in India, submerged aquatics had cut water flow by 80% in the canals. The dense growth of aquatic weeds pollutes water by deoxygenating it and killing the fish. These plants have the potential for exploitation as animal feed, human food, a food source for some aquatic organisms, soil additives, fuel production, wastewater treatment, raw materials, and habitat for many organisms. With increased industrialization, travel and communication, agricultural productivity, increased human population, and changes in consumption, problems associated with aquatic weeds have increased in the last century (Davis and Hirji, 2003).

Sustainable Management of Weeds

The utilization of weeds for human betterment is one of the management methods of weeds. Still, it needs extensive work in every field concerned with human, animal husbandry, industry, pharmacy, etc. Stepp and Moerman (2001) investigated the importance of weeds in ethnopharmacology. Stepp (2004) reported the role of weeds as sources of pharmaceuticals. Nathani *et al.* (2008) evaluated *Parthenium* for pulp and paper making. Sushilkumar (2010) suggested the utilization of weed as a better way of management. Ramesh Babu *et al.*(2012) also recommended weed utility as a concept and practice for sustainability.

According to Rao *et al.* (2017), India's future weed management strategies and technologies should target agricultural transformation aimed at an eco-efficient revolution with increased efficiency of scare resources used to meet the food demands of increasing population while minimizing many negative environmental factors impacts associated with current food systems. Mukherjee and Gopal (2005) reported the effect of herbicides on weed management on transplanted rice (*Oryza*

sativa). Patel *et al.* (2005) reviewed the role of soil solarisation in weed management. ... solarisation may help in managing weeds economically in commercial and horticultural ... Ample research has been published on India's allelopathic interactions between crops and ... India's innovative biological weed control was first documented in 1795 (Muniappan et al., 20... Mishra and Singh (2011) discussed the advantage of a zero-till system over a conventional till ... system. Biological control with the Mexican beetle *Zygogramma bicolorata* Pallister (Coleop... Chrysomelidae) was effective and economical in *Parthenium* management (Sushilkumar and ... 2011). Hasti *et al.*(2015) described allelopathy as a natural tool for weed management in field c... Girase *et al.*(2017) reported integrated weed management in pearl millet, and Singh and ... (2018) reported integrated weed management in pigeon pea.

Various approaches, including the use of preventive measures, intercropping, cover cropping, ... residue as mulches, competitive crop cultivars, optimum planting geometry, optimum wa... time, herbicide-tolerant (HT) cultivars, and herbicides (components of integrated method... to be followed to manage weeds (Sharma and Singh, 2014) successfully. Harding and Ra... (2015) reviewed controlling weeds with fungi, bacteria, and viruses. Yaduraju and Mishra (20... in enhancing farmers' income through innovative weed management, discuss different ... management methods. Chinnamuthu (2017) described recent trends and developmen... nanotechnology applications in weed management. Through utilization as food, fodder, ... medicine, Patil and Kore studied the management of an exotic weed Alternanthera tenella ... var. tenella Veldk (2015, 2017, 2018, 2019).

Conclusion

A literature review provides ideas and work done about sustainable management of weeds ... helps in future implementation in weed management.

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