

**STUDYING OF GROWTH, PROPAGATION AND
CONTROL OF WATER HYACINTH
(*Eichhornia crassipes*)(MART)
IN NENIVA PROVINCE**

A Thesis Submitted

by

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to

**The Council of College of Agriculture and Forestry
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Degree Doctor of Philosophy**

in

Field Crops Science (Weed Control)

Supervised by

Dr. Ahmed Mohammed Sultan

Professor

2012 A.D

1433 A.H

**University of Mosul
College of Agriculture
and Forestry**



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Summary

Water hyacinth (*Eichhornia crassipes*) is an aggressive free floating plant which propagation are sexually producing seeds and by vegetative propagates (daughter plant) . It has a high speed of growth rate .The focus of this project was to study the behavior of plant growth under different ecological biological factors and propagation during growing season 2010-2011 in Northern Iraq .Also the other aim was to determine the effect of different methods of control (physical and chemical) on aquatic weed (Water hyacinth) with estimating the herbicidal residual in water .The study have seven experiments ,five of them were conducted on ecology and biology study, while tow experiments were carried out on its control .Data were subjected to the conventional analysis of randomized complete block design (RCBD) for the experiment conducted in the field while others were subjected in (CRD)complete randomization design conducted in pots .Factorial or simple experiments were used in these design .The results could be summarized as follows:

1-The Water hyacinth seed germination percentage 87% under temperature (25-34 c°) and light .After germination there are a three stages ,the first that after germination ,the seedling remains attached to the mud ,secondly , after some time, the seedling get detached from the mud and become free floating ,thirdly ,it then multiplies vegetative .Furthermore ,speed of germination be high as temperature rise .However ,one seed germinated gave 206 daughter plant which infesting 1/4 m² with 2.199 m² leaf area in 64 days after germination.

2-One individual of Water hyacinth plant had potential of producing 2320 daughter plant with biomass 3.562 kg/ m² dry weight or 48.542kg/ m² fresh weight .It capable to producing mat covering 7.5 m² in 193 days .However ,the relative growth rate was higher in August and September than in June or July.

3- Water hyacinth has a high rate of vegetative growth and multiplication to cover large area as the result of horizontal growth in stagnant water .The long rhizome

was 25cm with mat had covered 420.66 cm long in five months .On other hand, horizontal distant mat covered 133.67 cm and 124 in August and July respectively ,which produced 170.67, 197 propagates in July, August respectively .

4- A single plant had planted on July or August was significant and produced large leaf area, long rhizomes ,tall inflorescences and a good growth rate than in May or June .However ,the plants have a high rate of vegetative grew on shallow water than in deep water .Longer rhizome, low number of daughter plant and tall plant had seen in Water hyacinth which growth in deep water .On other hand ,the treatment of deep water provided significantly effect on growth than different time of Water hyacinth planting during summer season.

5-There is different in size or biomass of Water hyacinth when the daughter had planted at different tall (10,15,20 cm)which reflecting on increasing the rate of evapotranspiration ,resulting in water loss or water use up. The quantity of water consumed were 4.383 ,5.493 and 7.408 L/plant /month according to different tall plant (10,15,20 cm) respectively .On June the water consumed was increased up to 63.8% as compared on May which depend on massive growth .

6-Application of Glyphosate provided a good control of Water hyacinth than 2,4-D and use of rope- wick wiper technique was the best treatment than post emergence of herbicide application which had reduced the pollution on water quality up to 85.5% when reapplication in season .Good control was obtained at the rate 1:10 ,1:5 (herbicide : water) for Glyphosate and 2,4-D respectively .However ,the best duration between two herbicidal application is 10-20 days.

7- Control of Water hyacinth was unsatisfactory with physical means (mowing) if the duration between mowing have along time but frequent mowing with short time duration had killed weed up to 55% .The orthogonal comparisons of mowing treatments ,there was clear evident that speed of growth was superiority than during mowing and the different time of mowing had increased the sexual and a sexual of Water hyacinth plant .Therefore ,the method of control is not convenient or not a good option.