

# Germination Response of Dodder Seeds with Some Agricultural crops Seeds in Laboratory Conditions

Ibraheem M . Aliyas\* , Muhammed A . Ahmed\* , Muhammed Y. Ali\*\*

\* Lecturer, Technical Institute in Mosul- Iraq

\*\* Ass. Lecturer, Technical Institute in Mosul- Iraq

**Abstract-** Experimental research was conducted in the laboratory of plant protection, department of plant production in Technical Institute / Mosul City in Iraq. On 08.10.2013 to 20.10.2013 .The experiment was include by planting(50) seed with two replication from (20)crop by using(25) Dodder seeds with each Petri dishes by addition a control treatment. Found the germination percentage of Dodder seeds as following: With Sorghum 90% ,With Flax 50%,with Piper 52% , with Egg plant 53% , with Alfalfa 57 % ,with Squash 5% , With Barley 7% , with Melon 8% , with Lentil 9% , with Wheat 10% , with Lettuce 2% , with Tomato 4% , with Millet 1% , there isn't Dodder seeds emergence with Corn ,Bean, Watermelon , Cucumber , Buckwheat , Okra , Safflower. The emergence Dodder seeds alone as control was 4% , clear from above data ,the presence of crop seeds were necessary to germinate Dodder seeds with some crops, also Dodder cant able complete their life cycle by absence the host, which clear the impact of Dodder in growing stage of crop plant and reflects on yield, that require more studies about physiological process to find suitable control in emergence stage by using wild botanical extractions as biological control which consider friendship of ecology to achievement sustainable agricultural development.

**Index Terms-** Dodder , Germination , Seeds, Response , Iraq

## I. INTRODUCTION

Dodder seeds are brown, yellow or grey and 1-2 mm in diameter. The seeds are slightly pear shaped and similar in size to clover and Lucerne seed . A single plant can produce over 2000 seeds, which can remain viable in the soil for up to 20 years [1]. Dodder is a parasite weed that causes serious problems in Iraqi land with all plants, it is widespread there is identified more than 150 species. Dodder emergence as a rootless, leafless stem, dependent on the food reserve stored in the seed for its immediate survival. A suitable host, such as alfalfa or certain weeds , must be found with in a few days (5-10) or Dodder seedling will die [2] . Didders are annual parasitic plant that reproduce by seed and do not have any leaves and chlorophyll to live from-they therefore must obtain all of their growth requirements by attaching themselves to other living green plants (host plants) . Host plant include these grown for agricultural purpose , ornamental plants , range plants and weeds

Dodder seeds germinate near the soil surface and send up slender which rotates slowly until it touches the stem or leaf another plant and begins to wind around it . On a host plant , the Dodder stem will immediately form small appendages called hystoria. Soon after attaching to a host plant ,the lower end of the Dodder withers and break its connection with the ground , while the upper of the stem grows rapidly [3] . It is a true obligate parasite , spread by seed , in the genus *Cuscuta* , the defining characteristic of the mature embryo is the absence of cotyledons . This may be attributable to the fact that the first job of the young stem is to search for a host , not to photosynthesize . Each ovary bears four ovules but one or more may abort . which °and 1 mm across . The fruit is an indehiscent oblong to sub globes capsule bearing a persistent style , enclosed by the corolla . Each capsule bears 4 seeds . Dodder plant °°°°°°die after germination in the absence of a host plant [ 4 ] .

## II. MATERIALS AND METHODS

Dodder seeds were collected in autumn 2012 from Piper plant could be cultivated in °parasite on Piper plant, then dried the Dodder seeds for prepare seeds to the study . Experimental study was conducted in the Department of plant production . Technical Institute of Mosul, in date 08.10.2013 , by planting( 50 ) seeds in two replications for 20 crops and ( 25 ) of Dodder seeds in Petri dishes by using double filter paper as planting media for germination under experimental ecology conditions which the temperature was 25C° in germinator ,that consider optimum condition to germination, which advocated with many researchers . been observation samples were cultivated on a daily form, there found the completion of germination of crop seeds in all treatments which planted after 6 days. Where had calculated germinated Dodder and °°crop seeds on the last counting day after 12 days . The water requirement of Petri dishes was daily given about one milliliter to each seed for covering water demand and on sure the germination. the emergence of embryo and the rise of part of radical adopted the status for germination in calculated seed emergence in the last count . through data which obtained from study estimated the percentage of seedlings of crops and Dodder emergence , the table (1) gives some information about practical experiment.

**Table ( 1 ) Shows practical Data about process of germination :**

Replications	N0.of seeds	Date planting	Date counting	Water amount.ml
1	50 crops	08.10.2013	20.10.2013	50
	25 Dodder	08.10.2013	20.10.2013	50
	50 crops	08.10.2013	20.10.2013	50
2	25 Dodder	08.10.2013	20.10.2013	50
	control	08.10.2013	20.10.2013	25

To calculate the percentage of seed germination used the following formula:

$$\% \text{ Seed germination} = \frac{\text{N0.of Seeds germinated}}{\text{Total of seeds}} \times 100 .$$

### III. RESULTS AND DISCUSSION

Through estimation of germination tests on a various seed crops , observed variation in the percentage of seed germination as the table ( 2 ),this belong to differentiation the viability of crop seeds, this not the aim of this study, but the important purpose was focus on the Dodder very dangerous parasite plant which causes damage to all plants in growing stage , in this study found the variation of the Dodder germination responsible with crop seeds as the table ( 2 ) , which clear as the following : with Sorghum 90%,with Flax 50% ,with Piper 52% , with Eggplant 53% , with Alfalfa 57 % , with Squash 5% , with Barley 7% , with Melon 8% , with Lentil 9% , with Wheat 10% , with Lettuce 2% , with Tomato 4% , with Millet 1% , there isn't Dodder germination with; Bean ,Corn ,Watermelon ,Cucumber , Buckwheat , Okra and Safflower, the percentage of germination in control was 4% . these data indicates the relation between Dodder seeds and crop seeds in emergence by different levels , this belong to various chemical composition of seeds which helps Dodder seeds to emergence .Must be benefit from studies to find suitable methods to control Dodder dangerous plant, because was wide spread, there are over 150 types of Dodder (*Cucuta sp* ) worldwide, belongs to the Convolvulaceae plant family and because of Dodder are annual parasitic plants that reproduce by seed and do not have any leaves or chlorophyll to live from – they therefore must obtain all of their growth requirements (water. Minerals. carbohydrates ) by attaching themselves to other living green plants (host plants) .Dodder effect in all plants in special growing stage by the reason of lowing photosynthesis efficiency and reducing the new branches growing ,the yield loosing in Alfalfa reaches 500% , which advocated by [ 5 ] , the

control of Dodder plant require wide studies, the applying of herbicides on Dodder were not effective. In study the results show that water extracts of four common plant species were used, they are *Cynodon dactylon L.* , *Imperata cylindrica L.* , *Sorghum halepense L* and *Phragmites communis L* . To test the effect of these extracts on the growth of Dodder infecting Eggplant enormously. The result showed water extract of weeds under investigation have significant effect on the degree of killing Dodder in comparison with control treatment after 30 days. The extract of *Cynodon dactylon L.* has the highest effect of controlling Dodder, also has the highest effect of stimulation growth and improving quality of Eggplant after 30 days of treatment [ 6 ] . The table (2) shows the percentage of seeds germination in Dodder and Crops by comparison with Dodder control treatment.

In Biological Control ,Several disease organisms are known to infect dodder including *Fusarium tricinctum* and *Alternaria species*, which attack swamp dodder (*C. gronovii*), and *A. alternata* and *Geotrichum candidum*, which attack field dodder (*C. pentagona*). Researchers in China have found that a suspension of *Colletotrichum gloeosporioides* can selectively control the dodder species *C. chinensis* and *C. australis* in soybeans. Difficulty in culturing and applying these organisms has limited their commercialized use [ 7 ] .

The recommendation of this study to find better ways in seedling stage of economic crop plants to kill the Dodder in emergence stage before its parasite on the hosts plant , by biological selective control to achieve sustainable agricultural development .

Table (2) indicates some information's about seeds emergence of Dodder and Crops

Crop kind	%Crop emergence	% Dodder emergence
Sorghum	98	90
Flax	75	50
Pepper	70	52
Eggplant	65	53
Alfalfa	90	57
Squash	80	5
Barley	92	7
Melon	80	8
Lentil	75	9
Wheat	85	10
Lettuce	70	2

Tomato	75	4
Millet	5	1
Bean	50	0
Corn	90	0
Watermelon	98	0
Cucumber	92	0
Buckwheat	85	0
Okra	90	0
Safflower	98	0
Control -		4

#### REFERENCES

- [1] Steve B.Orlof and others , Gully- August ,1989, Dodder control in Alfalfa , California Agriculture , VOL .43 , NO; 4 , PP, 30-32 .
- [2] Jamshid Ashigh and Esther E.Marquez , 2010 , Dodder (Cuscuta spp ) Biology and management , College of Agricultural,Consmer and environment science , New Mexico State University. Article , p. ,4 .
- [3] Robyn J. Burnham , 1992 , Plant Density Website Cuscuta indecora , University of Michigan , P.,1-5
- [4] Abul-Hashem , 2005 , Management of Dodder – anew parasitic weed , center for cropping system , Department of Agriculture and food Western Australia ,P.O.Box 483,Northam WA6401 Australia p. , 5 .
- [5] Salim H . A and Thyab A . K , 2012 , Effect of some methods control in Growth of Dodder (Cuscuta sp ) in Alfalfa , Field Journal of Tikret in Agricultural Science , VOL.( 12 ) NO. ( 1 ) , P . , 80-85 .

- [6] Sattar . J .Fahad . 2008 , Response of Dodder ( Cuscuta planifloraiten L . ) , Grown on Eggplant (Solanum amelogen L . )to some Plant Extract , Journal of Missan research , ( 5 ) , No. ( 9 ) , P . . , 335-355 .
- [7] Dawson, J. H., L. J. Musselman, P. Wolswinkel, and I. Dorr. 1994. Biology and control of Cuscuta. Rev. Weed Sci. 6:265-317.

#### AUTHORS

- First Author** – Ibraheem M . Aliyas, Lecturer, Technical Institute in Mosul- Iraq  
**Second Author** – Muhammed A . Ahmed, Lecturer, Technical Institute in Mosul- Iraq  
**Third Author** – Muhammed Y. Ali, Ass. Lecturer, Technical Institute in Mosul- Iraq