# The effect of Dolvic 1%OD herbicide on some morphological, chemical characteristics and yield of wheat

**Hamaad, Ramadan F. and Sekina S. Emam**

Central Agricultural Pesticides Laboratory, Agricultural Research Centre, Dokki, Giza, Egypt

**Abstract:** Weeds cause severe competition with wheat crop in Egypt and highly reduce yield. The aim of this work was to evaluate weed herbicide Dolvic, which is used as post-emergence herbicide for control broadleaf weeds on wheat (*Triticum aestivum* L.). The experiment was done in glass house during two successive seasons 2019/2020 and 2020/2021. Wheat plants were treated with recommended dose, half dose and double concentration of recommended dose. Some morphological and chemical characteristics were determined three weeks after application and the biomass, stem weight, root weight, spike weight and grain weight were also determined at harvest time. Results showed that wheat plant length, stem length and root length in the plants, which treated with double dose application, recorded significantly decreases during the two successive seasons when compared with control. Also, the results showed that Carotene, Chl. A, Chl. B and Total Chl. did not record significantly differ with half dose and recommended dose of Dolvic but double dose recorded significantly decreases for all pigments when compared with control. Biomass, root weight, spike weight and grain weight did not show significantly decreases between half and recommended dose than all treatments and control during the two successive seasons, while wheat plants which treated with double dose recorded high significantly decreases during the two successive seasons. It can be recommended that the post emergence application of Dolvic herbicide on wheat was significantly increased the yield attributes when recommended dose was used.

**Keywords:** wheat, Dolvic1%OD (Dusts), morphology, pigments, yield.

## 1. Introduction:

Wheat (*T. aestivum* L.) is the most important cereal crop in Egypt, since it is stable food for humans. Wheat grains, in Egypt represents almost 10 percent of the total value of agricultural production and about 20 percent of all agricultural imports (**Egypt wheat Sector Review, FAO, 2016**). Wheat is often suffering strongly from competition by numerous weed species, where the reduction of wheat yield due to weed infestation reached 30- 50%. Weeds compete with crop plants for various resources such as water and nutrients, resulting in low yields (**Jarwar *et al.*, 2005**). The most harmful and upsetting weeds in wheat crop in Egypt are Scarlet pimpernel **(***Anagallis arvensis)*, Burclover, Toothed medik (*Medicago polymorpha*), Sea beet, Wild beet (*Beta vulgaris*), Watercress (*Coronopus squamatus*), Hare's thistle (*Sonchus oleraceus*) Small-flowered mallow (*Malva parviflora*), Bishop's weed (*Ammi majus*) **(Elattar, 2018)**.

In recently years, all the world countries resort to use chemical weeds control because it is cheaper and available than mechanical control **(Gianessi, 2013).**

The crop plants and weeds absorb the post emergence herbicides; the plants are able to metabolize the herbicides hence they are not affected whereas weeds are not able to metabolize the herbicides, which prove to be phytotoxic **(Muhammad, *et al.* 2011 and Caverzan *et al.*, 2019**).

Chemical weed control in wheat fields by post-emergence herbicides has been used to control weeds in wheat fields in Egypt to improve wheat productivity through elimination of weed competition (**Javaid, *et al.* 2007**). This study aims to evaluate the phytotoxicity on wheat plants of new herbicide (Dolvic 1% OD) which use for weed management of wheat crop (*T. aestivum* L.) as well as their effect on some morphological, chemical characteristics and yield.

## 2. Materials and Methods:

### 2.1. Herbicide preparations

Dolvic 1% OD (Mesosulfuron-methyl 0.75% + Florasulam 0.25%) is post-emergence broadleaf weed herbicides. It was suspended individually in water tap to make recommended dose (R. Dose), half dose (1/2 Dose) and double dose (2 Doses) of the Egyptian Ministry of Agriculture official dose (1785cm$^3$ rate/ ha).

### 2.2. Glass house treatments

Wheat seeds (*T. aestivum* L., Gemeza-11) were planted in plastic pots (50 mm diameter) filled with soil (ten seeds per pot). The pots of the three treatment in addition to control were distributes in glass house (Central Agricultural pesticides Laboratory) in completely randomized design with four replications each replicate was ten pots, then irrigated and kept until emergence. After emergence, seedlings were thinned to 5 plants per pot. Wheat seedling were fertilized by adding 1.50 g/pot (NPK 20/20/20), weekly. Three weeks after

planting the wheat seedling were treated with different Dolvic doses.

**2.3. Estimation of some wheat morphological characteristics**

The plants were selected at random from each plot, their length was measured by using measuring tape from soil surface to the final growing point, and the average was calculated accordingly after three weeks from Dolvic applications of different doses. Also, some whole wheat plants were taken off from the pots to measure the root length. Parameters were recorded as: plant length, stem length and root length (cm) and compared with control (**Zand *et al*., 2010**).

**2.4. Determination of some wheat chemical characteristics.**

The plant pigments were determined three weeks after Dolvic application. Leaf tissue (10 mg) from each used Dolvic dose in addition to the control was placed in a test tube containing dimethyl sulphoxide (DMSO, 5 ml). Chlorophyll and carotenoids were extracted into the fluid without grinding by incubating overnight. Absorbance was measured at 644 and 662 nm for chlorophyll determination, and 470 nm for carotenoids (**Hiscox and Israelstam, 1979)**.

Total chlorophyll, chlorophyll a, and b were calculated using **Arnon equation (1949)**, while **Cañal *et al*., (1985)** was used for carotenoids.

Arnon equation:

Chl. A = 12.7 x O.D 662 – 2.69 x O.D 644 mg/l

Chl. B = 22.9 x O.D 644 – 4.68 x O.D 662 mg/l

Chl. A+B = 20.2 x O.D 644 + 8.02 x O.D 662 mg/l

Cañal equation:

$$\text{Carotenoids} = \frac{A470 - 1.28\,(\text{Chl. a mg/l}) + 56.7\,(\text{Chl. b mg/l})}{2560.906} \quad \text{mg/l}$$

## 2.5. Determination of yield parameters

After harvest biomass (whole plant weight), stem weight, root weight, spike weight, grain weight (g) and weight reduction (%) were recorded then compared with control **(Wara *et al*., 2020)**.

## 2.6. Statistical analysis

The statistical analysis was done by using a one-way ANOVA by SPSS statistical software according to **Landau and Everitt (2004**). Treatments in both laboratory experiments were laid out in a randomized complete block design with four replicates. All data were statistically analyzed by ANOVA and treatments means with SD were compared using least significant differences (LSD) at p = 0.05.

# 3. Results and Discussion:

## 3.1. Effect of Dolvic on some morphological characteristics of wheat plants

Table 1 showed the effect of the Dolvic application at (½ dose, R. dose and double dose) on plant length, stem length and root length (cm) after three weeks of treatment in 2019/2020 and 2020/2021 seasons. Statistical analysis showed no significant difference between half and recommended dose than control on plant length, stem length and root length being 77.30,65.00, 12.33cm and 77.00,64.8, 11.90cm for half dose of Dolvic where it were 75.50, 64.16, 11.33cm and 75.00, 64.00, 11.70cm for recommended dose of Dolvic in the first and second seasons, respectively. The double dose application were significantly effect on the wheat morphological characteristics which reduced plant length, stem length and root length which were 71.00, 60.33, 10.66cm and 70.00, 60.00, 10.50cm in the first and second seasons, respectively than control which were 79.10, 67.16, 12.00cm and 78.10,67.00,11.80cm in the first and second seasons, respectively. In this respect **Qasem and Hassan (2003)** found that herbicides cause phytotoxicity when they are used in a higher dose than recommended dose. However it causes the inhibitory effects on shoots and root growth of seedlings which were shorter than control plants.

## 3.2. Effect of Dolvic on of some chemical characteristics of wheat plants

Data in Table 2 and Figure 1 illustrated the effect of Dolvic application with ½ dose, R. dose and double dose on some chemical characteristics of wheat plants after three weeks of treatments such as Carotene, Chl. A, Chl. B, Total Chl. and A/B ratio. The Carotene, Chl. A, Chl. B, Total Chl. (mg/g fresh weight) of wheat leaves contents were not significantly affected with Dolvic half dose application whereas it were 0.042, 0.920, 0.200, 1.120 mg/g fresh weight and 0.043, 0.921, 0.201, 1.122 mg/g fresh weight in 2019/2020 and 2020/2021seasons, respectively. Also these pigments were not affected with the recommended dose of Dolvic which was 0.045, 0.923, 0.202, 1.125mg/g fresh weight and 0.046, 0.924, 0.203, 1.127mg/g fresh weight in 2019/2020 and 020/2021seasons, respectively. The double dose application of Dolvic herbicide were significantly effected the above mentioned pigments, which were significantly differ from untreated plants in control being 0.031, 0.790, 0.181, 0.971 mg/g fresh weight and 0.032, 0.791, 0.182, 0.973 mg/g fresh weight in the first and second seasons, respectively. The control plant leaves

showed relative higher pigments than treatments being 0.044, 0.922, 0.201, 1.123 mg/g fresh weight and 0.046, 0.924, 0.202, 1.126 mg/g fresh weight, respectively. Data in table 2 and figure (2) showed that A/B ratio of wheat leaves during recorded decrease with increase of Dolvic dose. The A/B ratio of wheat leaves in the control was 4.59 and 4.57 for in first and second seasons, respectively.

**Table (1) Effect of Dolvic 1% OD application of on some morphological characteristics of wheat during two successive seasons after three weeks of treatments**

| Treatments | Plant length (cm) | Stem length (cm) | Root length (cm) |
|---|---|---|---|
| | **First season** | | |
| **Control** | 79.10±2.04[a] | 67.16±1.13[a] | 12.00±0.50[a] |
| **1/2 Dose** | 77.30±2.05[a] | 65.00±1.14[a] | 12.33±0.51[a] |
| ***R. Dose** | 75.50±2.04[a] | 64.16±1.13[a] | 11.33±0.52[a] |
| **2 Doses** | 71.00±1.65[b] | 60.33±1.39[b] | 10.66±0.81[b] |
| | **Second season** | | |
| **Control** | 78.10±2.05[a] | 67.00±1.14[a] | 11.80±0.52[a] |
| **1/2 Dose** | 77.00±2.06[a] | 64.8±1.15[a] | 11.90±0.51[a] |
| ***R. Dose** | 75.00±2.07[a] | 64.00±1.13[a] | 11.70±0.53[a] |
| **2 Doses** | 70.00±1.66[b] | 60.00±1.38[b] | 10.50±0.81[b] |

*R. Dose: recommended dose by Egyptian Ministry of Agriculture.
Values are means of three replicates of each parameter ± Standard Deviation.
Means within each column followed by the same letter are not significant at $p > 0.05$ between treatments two successive seasons.

The double recommended dose recorded the lowest A/B ratio being 4.36 and 4.35 in first season and second season, respectively. This ratio was 4.60 and 4.58 for the half recommended dose, while was 4.57 and 4.55 for recommended dose in the first and second seasons, respectively. In this respect **Strange (2012)** reported that high dose of herbicides alters plant growth, physiology, and metabolism and ultimately results in phytotoxicity and decrease productivity spike and grain weights (g) which treated with 1/2 dose were 37.77, 12.27, .48,19.01, 12.51g and 37.00, 13.27,6.20,20.01,12.00g in the first and second seasons, respectively. Biomass, stem, root, spike and grain weights (g) of wheat plants which treated with recommended dose of Dolvic were 33.91, 12.22, 3.84, 17.84, 11.41g and 33.00, 13.22, 3.80, 17.00, 12.41g in the first and second seasons, respectively. Statistical analysis showed that 1/2 dose and recommended dose of Dolvic were not significantly differ than control which were 40.68, 13.48, 5.23, 21.96, 14.37g and 40.00,13.40, 5.20, 21.00, 14.00g in the first and second seasons, respectively. But biomass, stem, root, spike and grain weights of wheat plants which treated with double dose of Dolvic recorded high significant decreases when compared with control which were 26.89,09.45,2.03, 14.40, 08.65g and 26.00,09.40, 02.00,14.00, 08.00g in the first and second seasons, respectively.

## 3.3. Effect of Dolvic application of on wheat yield

Data in Table 3 showed the effects of Dolvic treatments at 1/2 Dose, R. dose and double dose on some wheat biomass, stem, root, spike and grain weights (g) in 2019/2020 and 2020/2021 seasons. Wheat biomass, stem, root,

Data in table 3 and Figure (3) illustrate that wheat weight % recorded significant reduction in wheat weight parallel with the level Dolvic application from 0% for control wheat plants to 33.90% for wheat plants treated by double recommended dose during first season and 33.00% for wheat plant treated by double recommended dose during second season. These data agreed with **Shahid (1994)** who reported that Dolvic and many other

herbicides applications did not affect significantly on the wheat spike length and number of grains per spikelet. Also, **Fayed (1998) and Gupta (2004** reported that Dolvic and many other herbicides applications reduce the number of grains/spike when compared to the rest of broadleaf weed control treatments. **Safina and Absy (2017)** evaluate some broadleaf weed herbicides on wheat and found that Florasulam which was one of Dolvic components when used in high concentration (1.42%) which recorded reduction in wheat yield when compared with weedy check. **Elattar (2018)** found that post-emergence application of some broadleaf weed herbicides on wheat especially Florasulam increase wheat plant height when compared to weeded check.

**Table (2) Effect of Dolvic 1% OD application on of some chemical characteristics in Wheat plant after three weeks of treatments (mg/g Fresh weight) during 2019/2020 and 2020/2021 seasons.**

| Treatments | Carotene | Chl. A | Chl. B | Total Chl. | Chl. A / Chl. B |
|---|---|---|---|---|---|
| | | **First season** | | | |
| **Control** | 0.044±0.09[a] | 0.922±0.02[a] | 0.201±0.01[a] | 1.123±0.01[a] | 4.59 |
| **1/2 Dose** | 0.042±0.08[a] | 0.920±0.01[a] | 0.200±0.03[a] | 1.120±0.02[a] | 4.60 |
| ***R. Dose** | 0.045±0.09[a] | 0.923±0.03[a] | 0.202±0.01[a] | 1.125±0.01[a] | 4.57 |
| **2 Doses** | 0.031±0.01[b] | 0.790±0.09[b] | 0.181±0.08[b] | 0.971±0.07[b] | 4.36 |
| | | **Second season** | | | |
| **Control** | 0.046±0.09[a] | 0.924±0.01[a] | 0.202±0.02[a] | 1.126±0.01[a] | 4.57 |
| **1/2 Dose** | 0.043±0.08[a] | 0.921±0.02[a] | 0.201±0.01[a] | 1.122±0.02[a] | 4.58 |
| ***R. Dose** | 0.046±0.09[a] | 0.924±0.02[a] | 0.203±0.02[a] | 1.127±0.01[a] | 4.55 |
| **2 Doses** | 0.032±0.01[b] | 0.791±0.08[b] | 0.182±0.09[b] | 0.973±0.06[b] | 4.35 |

*R. Dose: recommended dose by Egyptian Ministry of Agriculture.
Values are means of three replicates of each parameter ± standard deviation.
Means in the respective columns followed by different letters are significantly different by LSD test at P= 0.05 between treatments during two seasons.

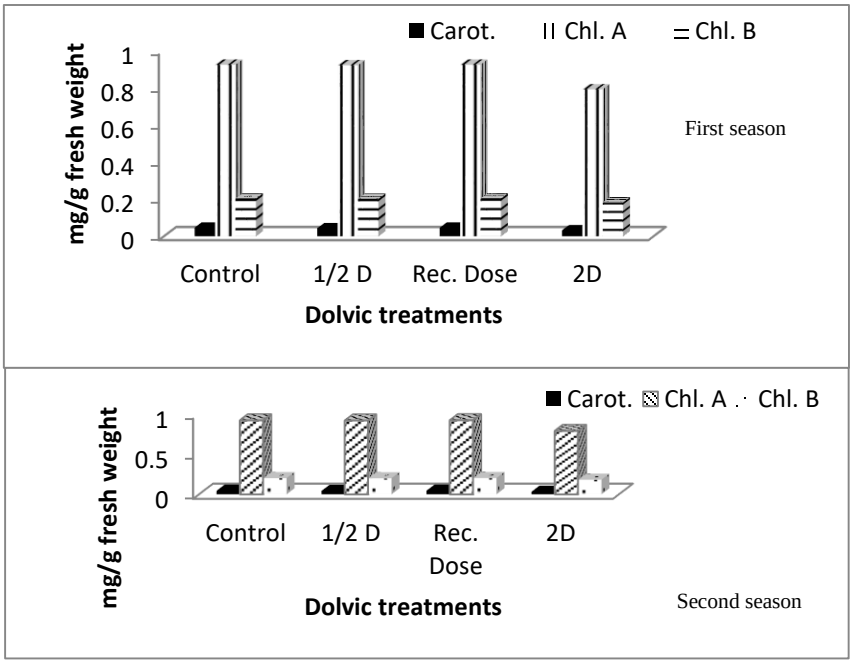


**Figure (1) Effect of Dolvic 1% OD application on of some chemical characteristics in Wheat plant after three weeks of treatments (mg/g Fresh weight) during 2019/2020 and 2020/2021 seasons.**

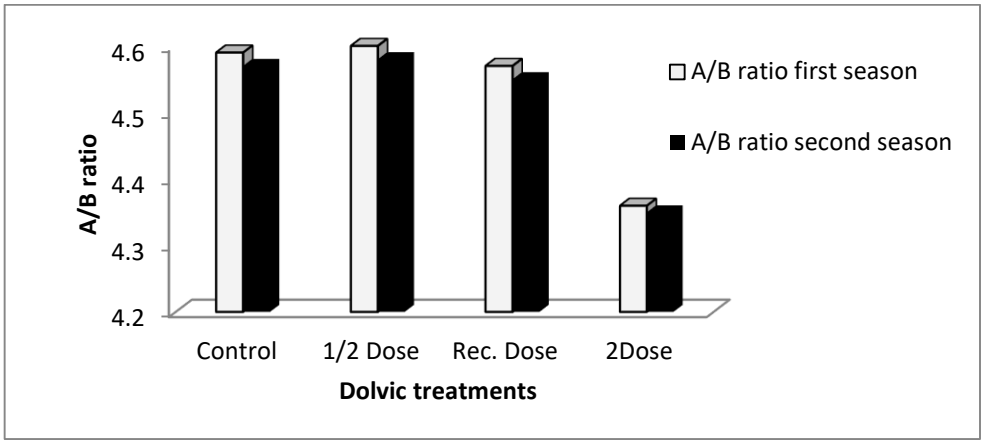


**Figure (2) Effect of Dolvic 1% OD application on A/B ratio during first and second seasons.**

**Table (3) Effect of application of Dolvic 1% OD on wheat yield after harvest during two successive seasons**

| Treatments | Biomass (whole plant weight, g) | Stem weight (g) | Root weight (g) | Spike weight (g) | Grain weight (g) | Weight reduction % |
|---|---|---|---|---|---|---|
| | | | **First season** | | | |
| **Control** | 40.68±2.49[a] | 13.48±0.86[a] | 5.23±0.41[a] | 21.96±1.40[a] | 14.37±0.45[a] | 0 |
| **1/2 Dose** | 37.77±2.48[a] | 12.27±0.87[a] | 6.48±0.40[a] | 19.01±1.41[a] | 12.51±0.46[a] | 7.1 |
| ***R. Dose** | 33.91±2.49[a] | 12.22±0.86[a] | 3.84±0.41[a] | 17.84±1.42[a] | 11.41±0.44[a] | 16.6 |
| **2 Doses** | 26.89±2.18[b] | 09.45±0.67[b] | 2.03±0.83[b] | 14.40±1.20[b] | 08.65±0.38[b] | 33.9 |
| | | | **Second season** | | | |
| **Control** | 40.00±2.40[a] | 13.40±0.87[a] | 5.20±0.41[a] | 21.00±1.40[a] | 14.00±0.45[a] | 0 |
| **1/2 Dose** | 37.00±2.41[a] | 13.27±0.86[a] | 6.20±0.40[a] | 20.01±1.41[a] | 12.00±0.46[a] | 7.0 |
| ***R. Dose** | 33.00±2.40[a] | 13.22±0.85[a] | 3.80±0.41[a] | 17.00±1.42[a] | 12.41±0.46[a] | 16.0 |
| **2 Doses** | 26.00±2.20[b] | 09.40±0.66[b] | 2.00±0.84[b] | 14.00±1.22[b] | 08.00±0.38[b] | 33.0 |

*R. Dose: recommended dose by Egyptian Ministry of Agriculture.
Values are means of three replicates of each parameter ± standard deviation.
Means in the respective columns followed by different letters are significantly different by LSD test at P= 0.05 between treatments during two seasons.

## Conclusion:

The effects of post emergence herbicide Dolvic in different doses on some morphological and chemical characteristics on wheat plants in addition to yield were studied. The half and recommended doses were not significantly effect on the plant length, stem length and root length. In addition, it was not significantly effect on carotene, Chl. A., B. and total chl. The obtained yield of these treatments was not significantly affected with Dolvic application. In contrast, of the previous results double dose application significantly reduces all wheat characteristics and yield. Also, biomass, stem, root, spike and grain weights were not significantly affect with half and recommended doses of Dolvic application, while were significantly affected with double dose.

## References:

**Arnon, D.I. (1949).** Copper enzymes in isolated chloroplasts, polyphenoloxidase in Beta vulgaris. Plant Physiol. 24 (1): 1-15.

**Cañal, V. M. J.; Fernandez, B. M. and Sanchez, R. T. (1985).** Effect of glyphosate on growth and the chlorophyll and carotenoid levels of yellow Nutsedge (*Cyperuse sculentus*). Weed Sci., 33: 751-754.

**Caverzan, A.; Piasecki, C.; Chavarria, G.; Stewart, N. and Vargas, L. (2019).** Defenses against ROS in crops and weeds: The Effects of Interference and Herbicides. Int. J. Mol. Sci. 20: 1086:1-20.

**Elattar, Hoda A.; Dahroug, S. M.; El-Sayed, W. and Hashiesh, Rensa, M. (2018).** Phytotoxicity and Effectiveness of Some Herbicides in Wheat Plantations. Arab Univ. J. Agric. Sci., Ain Shams Univ. 26 (2B), 1639-1657.

**FAO (2016) Food and Agriculture Organization of the United Nations.** Views country briefs. http://faostat.fao. org/site/567/default.aspx#ancor.

**Fayed, T.B.; Sabry, S. and Aboul-Ela, S. (1998).** Effect of wild oat herbicides on weed density, wheat grain, and yield components. Ann. Agri. Sci. Cairo, 43(1):173-188.

**Gianessi, L.P. (2013).** The increasing importance of herbicides in world wide crop production. Pest Manag. Sci. 69: 1099–1105.

**Gupta, O.P. (2004)**. "Modern Weed Management" (2nd ed.). pp. 18-23, Agrobios Jodhpur, India.

**Hiscox, J. D. and Israelstam, G. F. (1979).** A method for the extraction of chlorophyll from leaf tissue without maceration. Can. J. Bot. 57: 1332-1334.

**Jarwar, A.D.; Arain, M.A. and Rajput, L.S. (2005).** Chemical weed control in wheat. Pak. J. Weed Sci. Res. 11:11–15.

**Javaid, A., Bajwa, R., Rabbani, N. and Anjum, T. (2007)**. Comparative tolerance of six rice (*Oryza sativa* L.) genotypes to allelopathy of purple nutsedge (*Cyperus rotundus* L.). Allelopathy J.20 (1): 157-166.

**Landau, S. and Everitt, B. (2004).** A Handbook of Statistical Analyses using SPSS.

**Muhammad, N; Sattar, A.; Ashiq, M. and Ahmad, I**. **(2011).** Efficacy of pre and post emergence herbicides to control weeds in chickpea *Cicer arietinum* L. Pak. J. Weed Sci. Res. 17: 17-24.

**Qasem, J.R. and Hassan, A.A. (2003).** Herbicidal properties of some medicinal plants against Malva sylvestris and Portulaca oleracea. Dirasat 30: 84-100.

**Safina, S. A. and Absy, R. (2017)**. Egypt. J. Agron. Broadleaf Weed Control with Some Recent Post-emergence Herbicides in Bread Wheat (*Triticum aestivum* L.) in Egypt. Vol.39 (1): 41- 50.

**Shahid, A.E. (1994)**. Screening of different weed management practices for controlling weeds in wheat crop M.Sc. Thesis, Faculty of Agriculture, Gomal University, Pakistan. pp.102-108.

**Strange, M.L. (2012).** UC Master Gardener. Master Gardener Newspaper Articles. University of California Cooperative Extension, ,www.ucanr.edu. (accessed 12.05.19.).

**Varshney, S.; Hayat, S.; Alyemeni, M.N. and Ahmad, A.(2012).** Effects of herbicide applications in wheat fields is phyto-hormones application a remedy. Plant Signal. Behav. .7:570-575.

**Wara, T. U., Begum, M., Kader, M. A. Rasul, S., Hasan M. and Monira, S. (2020).** Effect of herbicides on weed control and performance of wheat. Asian J. Crop, Soil Sci. and Plant Nutrition, 03(2): 102-113.

**Zand, E., Baghestani, M.A., Alikhani, M.A., Soufizadeh, S., Khayami, M.M., PourAzar, R., Sabeti, P., Jamali, M., Bagherani, N. and Forouzesh, S. (2010).** Chemical control of weeds in wheat (*Triticum aestivum* L.) in Iran. Crop Protect. 29:1223–1231.

# تأثير مبيد الحشائش دولفيك 1%OD على بعض الخصائص المورفولوجية والكيميائية وانتاجية محصول القمح

**رمضان فرغلي حماد - سكينة سيد إمام**

**المعمل المركزي للمبيدات – مركز البحوث الزراعية-دقي-جيزة مصر**

**الملخص العربى:** تسبب الحشائش منافسة شديدة مع محصول القمح في مصر وتؤدي إلى انخفاض كبير في كمية وجودة المحصول الناتج والهدف من هذه الدراسة هو تقييم تأثير مبيد الحشائش دولفيك 1%OD (فلوراسيولام ٠,٢٥% + ميزوسلفيرون ميثيل ٠,٧٥%) على القمح صنف جميزة ١١ خلال موسمي ٢٠٢٠/٢٠١٩ و ٢٠٢١/٢٠٢٠ في البيت الزجاجي. حيث تمت معاملة نباتات القمح طبقا لتوصية وزارة الزراعة بثلاث تركيزات مختلفة هي ٣٧٥سم/فدان (1/2 جرعة) و ٧٥٠ سم /فدان (الجرعة الموصى بها) و ١٥٠٠سم/فدان (ضعف الجرعة الموصى بها). تم تقدير بعض الخواص المورفولوجية بقياس اطوال النباتات والسيقان و الجذور (بالسم) بعد المعاملة بثلاث اسابيع وكذلك تم تقدير بعض الخواص الكيميائية لنباتات القمح بتقدير محتوي أوراق القمح من الصبغات بالمللي جرام / جرام وزن طازج بعد معاملات الدولفيك بتركيزات مختلفة. وتقييم المحصول الناتج بقياس وزن النبات الكامل ، وزن الساق ، وزن الجذر ، وزن السنبلة، وزن الحبوب (بالجم) وحساب نسبة نقص الوزن بعد الحصاد. واظهرت النتائج عدم وجود اختلاف معنوي في اطوال النباتات واطوال الساق واطوال الجذور وكذلك معدل قياس كلوروفيل (أ) وكلورفيل (ب) والمجموع الكلي لهما عند المعامله بتركيز نصف الجرعة والجرعة الموصي بها مقارنة بالكنترول، ولكن مع زيادة تركيزالمبيد لضعف الجرعة الموصي بها حدث انخفاض معنوي في جميع قياسات الاطوال والصبغات مقارنة بالكنترول خلال موسمي الدراسة. واظهرت النتائج ايضا أن أوزان النبات كاملا والساق والجذر والسنبلة والحبوب لا يوجد فروق معنوية بين المعاملة بتركيز نصف الجرعة والجرعة الموصي بها مقارنة بالكنترول خلال موسمي الدراسة، ولكن سجلت نتائج المعاملة بضعف الجرعه الموصي بها انخفاضاً معنوياً كبيرا لهذه الاوزان عند مقارنتها بالكنترول خلال موسمي الدراسة. واثبتت هذه الدراسة ان استخدام مبيد الدولفيك 1%OD بالمعدل الموصي به ونصف تركيزه ادى الي زيادة الكفاءة الحيوية لنباتات القمح نتيجة لقتل الحشائش المتاحة وعدم تأثيره علي القمح وانعكس علي تحسين صفاته المورفولوجية والكيماوية وبالتالي المحصول الناتج بدرجة معنوية. اما عند زيادة الجرعة المستخدمة الي ضغف التركيز ادي الي حدوث سمية نباتية وادت الي خفض جميع صفاته بدرجة معنوية مقارنة بالكنترول لذا ينصح بعدم زيادة الجرعة المستخدمة علي نباتات القمح.