

EFFECT OF PERFLUIDONE AND NOMINEE ALONE OR IN COMBINATION WITH UREA ON THE GROWTH AND PROPAGATIVE CAPACITY OF PURPLE NUTSEDGE (*Cyperus rotundus* L.)

Messiha, Nadia K.

Botany Department, National Research Centre, Dokki, Cairo, Egypt.

ABSTRACT

In pot experiments, the influence of using different concentration of the pre-emergence herbicide perfluidone (250, 500 and 750 ppm) alone or in combination with 1 % urea as well as the new post-emergence herbicide nominee (400, 600 and 800 ppm) alone or in combination with 1 % urea, was studied on the growth and propagative capacity of purple nutsedge (*Cyperus rotundus* L.). Generally, the perfluidone and nominee alone or mixed with 1 % urea inhibited significantly the growth of foliage as well as the underground propagative organs of purple nutsedge. Moreover, the highest concentration of perfluidone alone (750 ppm) or mixed with 1 % urea (750 ppm + 1 % urea) and the highest concentration of nominee alone (800 ppm) or mixed with urea (800 ppm + 1 % urea) completely inhibited the formation of new propagative organs. The herbicide perfluidone did not adversely affect the viability of the dormant buds of the mother tubers, while the herbicide nominee adversely affect the viability of buds of the mother tubers.

The two herbicides alone or in combination with 1 % urea were effective in controlling the growth and propagative capacity of purple nutsedge.

The results also indicate the superiority of using the post-emergence herbicide nominee since it affected the viability of dormant buds of the mother tubers and inhibited completely the re-sprouting of new buds after 45 days from sowing.

INTRODUCTION

Purple nutsedge (*Cyperus rotundus* L.) is considered one of the most difficult to control, perennial weed, in many agricultural lands throughout the world (Holm and Herberger, 1970; Hauser, 1971; Holm *et al.*, 1991; Messiha, *et al.*, 1993; Neeser *et al.*, 1997; Burker *et al.*, 2003 and Grichar *et al.*, (2003). In Egypt, it is found during the whole year in crops, orchards, nurseries and gardens (El-Masry *et al.*, 1980). This weed becomes a problem because of its biological adaptability as well as its remarkable capacity for survival under extreme environmental conditions. Once a leafy shoot is established, a dense system of shoots is rapidly produced and interconnected by a complex underground system of rhizomes, roots, basal bulbs and tubers (Hauser, 1962; Wills and Brisco, 1970 and Neeser, *et al.*, 1997). The aggressiveness of this perennial weed is not only due to its rapid tuber formation, depth of tuber formation in soil and tuber dormancy, but is also assumed to be related to its high competitive ability as C₄ plant (Wills, 1987).

Control of purple nutsedge is difficult because of presence of numerous dormant tubers and the ability of tubers to resprout rapidly after chemical or mechanical damage (Horowitz 1972a and Willaim, 1976). Only a few available herbicides are recommended for controlling purple nutsedge (Pereira *et al.*, 1987; Grichar *et al.*, 1992 and Derr and Wilcut, 1993). Control with herbicides is often suboptimal because of the inconsistent translocation into tubers (Doll and Piedrahita, 1982).

The aim of the present investigation was to evaluate the efficiency of the pre-emergence herbicide perfluidone (destun) and the new post-emergence herbicide nominee (bispyribac-sodium) in controlling the growth and propagative capacity of purple nutsedge alone or in combination with urea. Special attention was paid to the viability of the dormant buds of the mother tubers after using the two herbicides.

MATERIALS AND METHODS

Pot experiments were carried out at the National Research Centre, during the two successive summer seasons of 2003 and 2004. The stock of purple nutsedge (*Cyperus rotundus* L.) used as a source of tubers was collected from a dense stand at National Research Centre, Experimental station. One hundred and four pots (30 cm diameter), filled with alluvial soil, were used in these experiments. Tubers of purple nutsedge were sown at 5 cm depth (one tuber per pot). Eight pots served as control. The remainder (96 pots) were divided into two groups. In the first group the pre-emergence herbicide perfluidone (deston). 1,1,1 trifluoro-N-[2-methyl-4-(phenylsulfonyl)phenyl] methane-sulfonamide was applied at a rate of 250, 500, 750 ppm by adding twenty ml to each pot. Each concentration was applied alone or in combination with 1 % urea. In the second group the post-emergence new herbicide nominee 2 % SL bispyribac – sodium 2,6-[(4-6-dimethoxy pyridimidin-2-yl)oxyl] was applied to two weeks old nutsedge plants at a rate of 400, 600 and 800 ppm. Each concentration was applied alone or in combination with 1 % urea. All sprays were performed by a glass atomizer fixed to a graduated tube at rate of 15 ml per plant. Four replicates were used for each treatment and all pots were kept out doors.

The percentage of germination of purple nutsedge was recorded after 15 and 30 days from sowing and the following characters were recorded after 30 and 45 days from sowing.

1. Number of mother shoots per tuber.
2. Number of leaves of mother shoots per tuber.
3. Length of mother leaves (cm).
4. Number of daughter shoots per tuber.
5. Number of leaves of daughter shoots per tuber.
6. Number of rhizomes per tuber.
7. Length of rhizomes per tuber.
8. Number of propagative organs (basal bulb and tubers) per plant.
9. Dry weight of foliage (g per plant).
10. Dry weight of underground organs (g per plant).
11. Total dry weight (g per plant).

To test the viability of the dormant buds of the mother tubers to re-sprout after either soil application of perfluidone (45 days from sowing) or post-emergence treatment with nominee (45 days from sowing), the mother tubers from each treatment were separated from the foliage and from the underground organs and soaked in 50 ppm solution of benzyl adenine (BA) for 24 hours to test their ability for re-sprouting as described earlier by Rehm and El-Masry (1976). The tubers from each treatment were washed with

distilled water and then placed in petri-dishes for 7 days to test their ability for re-sprouting.

The treatments were arranged in completely randomized design and the data were subjected to standard analysis of variance by means and L.S.D. at 0.05 (Snedecor and Cochran, 1967).

RESULTS

Table (1) shows that all purple nutsedge tubers germinated in the control treatment (100 %). A pronounced decrease in germination percentage was observed after 15 days from sowing by increasing perfluidone concentrations alone or in combination with 1 % urea. The maximum reduction (8.3 %) was obtained by the highest perfluidone concentration alone or in combination with 1 % urea (750 ppm and 750 ppm + 1 % urea). There was a gradual decrease in germination percentage of purple nutsedge after 30 days from sowing by increasing perfluidone concentrations alone or mixed with 1 % urea. The maximum reduction (33.3 %) was obtained by the highest concentration of perfluidone mixed with 1 % urea (750 ppm + 1 % urea).

Table (1) : Effect of applying perfluidone alone or in combination with 1 % urea on the germination percentage of purple nutsedge tubers after 15 and 30 days from sowing.

Perfluidone concentrations (ppm)	% of purple nutsedge germination	
	15 days from sowing	30 days from sowing
Control	100	100
250	50	83
500	50	83
750	8.3	41.7
250 + 1 % urea	50	66.7
500 + 1 % urea	50	66.7
750 + 1 % urea	8.3	33.3

Growth characters of mother shoots :

The number of mother shoots/tuber (Table 2) decreased significantly with the highest concentration of perfluidone alone or mixed with 1 % urea after 30 days from sowing when compared with control. However, the decrease in the number of mother shoots/tuber was significant with the three concentrations after 45 days from sowing when compared with the control. Adding 1 % urea to the herbicide did not affect significantly the number of mother shoots when compared with the corresponding concentration after 30 and 45 days from sowing.

It is clear from the data in Table (2) that the number of leaves of mother shoots/tuber decreased significantly with increasing the concentration of perfluidone alone after 30 days from sowing. The same effect was clearly observed on the same character after 45 days from sowing. Moreover, adding 1 % urea to the same concentrations caused more inhibiting effect to the number of leaves of mother shoots/tuber, except the lowest concentration after 30 days from sowing and the highest concentration after 45 days from sowing.

Table (2) shows also that the length of mother leaves significantly decreased with all rates of perfluidone alone after 30 and 45 days from sowing when compared with the control. The rate of reduction was enhanced by increasing perfluidone concentrations. Also, adding 1 % urea to the herbicide induced significant reduction in this character at the first stage (30 days from sowing) when compared with the control. The maximum reduction was recorded with the highest concentrations of perfluidone when mixed with 1 % urea at the two stages.

Growth characters of daughter shoots :

Table (2) shows that the number of daughter shoots and the number of leaves of daughter shoots were completely inhibited with all concentrations of perfluidone alone or mixed with 1 % urea after 30 days from sowing. Also, after 45 days from sowing these characters were significantly decreased when treated with perfluidone alone or mixed with 1% urea. Complete inhibition was achieved with the highest concentration of perfluidone alone or in combination with 1 % urea.

Growth characters of underground organs :

The data presented in Table (3) shows that the number of rhizomes per tuber and their length were completely inhibited when treated with all concentrations of perfluidone alone or in combination with 1 % urea after 30 days from sowing. Also, there was a great inhibition in number of rhizomes per tuber as well as their length after 45 days from sowing when compared with their corresponding control. The rate of reduction increased by increasing perfluidone concentration. Adding urea at 1 % to the herbicide induced significant reduction in the number of rhizomes per tuber as well as their length when compared with their controls and irrespective to the corresponding concentrations.

The number of propagative organs per plant was completely inhibited when treated with all perfluidone concentrations alone or mixed with 1 % urea after 30 days from sowing (Table 3). Great inhibition was also recorded in the same character after 45 days from sowing when perfluidone was applied. Adding urea at 1 % to the herbicide did not induce significant effect on number of propagative organs per plant when compared with the corresponding concentrations.

Dry weight :

Applying all perfluidone concentrations significantly inhibited the dry matter accumulation of foliage after 30 and 45 days from sowing as compared with the control (3). The rate of reduction increased with increasing the level of the herbicide concentration. Adding urea at 1 % to the herbicide caused significant reduction in the dry matter of foliage after 30 days

Table (2)

Table (3)

from sowing, while after 45 days, adding 1 % urea to perfluidone did not induce significant inhibition when compared with the corresponding concentrations except by the lowest concentration.

It is obvious from Table (3) that the dry matter accumulation in the underground organs decreased significantly after 30 and 45 days from sowing as compared with their control. Adding urea at 1 % to the herbicide induced significant reduction in the same character in the two stages (30 and 45 days from sowing) when compared with their control but irrespective to the corresponding concentrations.

Total dry weight of purple nutsedge was seriously affected with perfluidone alone or mixed with 1 % urea in the two stages as compared with their control. The rate of reduction increased with increasing the level of herbicide concentration but irrespective to their corresponding concentrations after 45 days from sowing (Table 3) and Fig. (1).

Growth characters of mother shoots :

Foliar sprays with nominee alone or mixed with 1 % urea did not induce significant changes in the number of mother shoots per tuber after 30 days from sowing as compared with the control (Table 4). In the second stage (45 days from sowing) foliar sprays of nominee alone or in combination with 1 % urea at all concentrations induced significant inhibition when compared with the control (Table 4). Moreover, the rate of reduction was enhanced by adding 1 % urea to the herbicide concentration but irrespective to the rate of application.

Table (4) shows that foliar sprays of nominee alone or mixed with 1 % urea induced significant decreases in the number of leaves of mother shoots per tuber in the two stages (after 30 and 45 days from sowing) as compared with their control.

Table (4)

Adding urea at 1 % to the herbicide did not affect significantly the number of leaves of mother shoots when compared with the corresponding concentration after 30 days from sowing. In the second stage (after 45 days from sowing) adding urea at 1 % to the herbicide inhibited the same character to a very great extent. The highest rate of nominee mixed with 1 % urea reduced the number of leaves of mother shoots to about 84 % as compared with control.

Nominee foliar sprays alone or mixed with urea inhibited to a very high extent the length of mother leaves after 30 and 45 days from sowing as compared with their control. Adding 1 % urea to nominee concentration did not induce significant increase after 30 days when compared with corresponding concentrations. However after 45 days from sowing adding urea at 1 % to nominee concentrations induced significant reduction when compared with the corresponding concentrations. The maximum rate of reduction was recorded with the highest concentration of nominee when mixed with 1 % urea. The reduction reached about 81 % from the control (Table 4).

Growth characters of daughter shoots :

Foliar sprays with nominee alone or mixed with 1 % urea completely inhibited the number of daughter shoots per tuber and the number of leaves after 30 days from sowing (Table 4).

In the second stage (after 45 days from sowing) these characters were also completely inhibited except with the lowest concentration of nominee (400 ppm) alone on the number of daughter shoots and the lowest rate of nominee alone or mixed with 1 % urea on the number of leaves of daughter shoots.

Growth characters of underground organs :

The experimental results (Table 5,A,B and C) reveal that nominee treatments alone or in combination with 1 % urea at the first stage (30days from sowing) resulted in complete inhibition in number of rhizomes per tuber and their length and the propagative capacity of purple nutsedge except the lowest rates from the applied herbicide (400 ppm and 400 ppm + 1 % urea). Nominee foliar sprays alone or mixed with 1 % urea significantly reduced the number of rhizomes per tuber and their length and the number of propagative organs after 45 days of sowing. The rate of reduction increased with increasing the herbicide concentrations and complete inhibition was recorded at the highest rate of nominee alone, (800 ppm) and the higher rates of the herbicide mixed with 1 % urea (600 ppm + 1 % urea) and 80 ppm +1 % urea).

Dry weight :

All nominee treatments alone or mixed with 1 % urea at the two stages induced significant reduction in the dry matter accumulation of foliage when compared with their controls. Adding 1 % urea to nominee concentrations did not affect significantly, the same character when compared with the corresponding concentrations at the two stages (Table 5).

Concerning the effect of nominee alone or mixed with 1% urea on the dry matter accumulation of the underground organs after 30 days from sowing, the experimental results recorded in Table (5) reveal that this

Table (5)

character was significantly affected by all concentrations of nominee alone or mixed with 1 % urea. The rate of reduction increased either by increasing nominee concentration or adding 1 % urea to the same concentrations. Nominee foliar sprays alone or mixed with 1 % urea inhibited, to a very high extent, the dry weight of underground organs after 45 days from sowing as compared to the control. Adding 1 % urea to nominee did not induce significant reduction as compared with the corresponding concentrations (Table 5).

The total dry weight of purple nutsedge was seriously affected by nominee either alone or mixed with 1 % urea in the two stages as compared with their controls. The highest rate of reduction was recorded after 30 days from sowing with the highest concentration of nominee alone or in combination with 1% urea and reached about 90 % as compared with the control.

The highest rate of reduction in this character after 45 days from sowing was also recorded with the highest rate of nominee mixed with 1 % urea and it was about 99 % when compared with the control (Table 5 and Fig. 1).

The data in Table (6) show clearly that while dormant buds of purple nutsedge tubers treated with perfluidone were capable of re-sprouting after soaking in benzyl adenine treatment, yet tubers previously treated with nominee failed completely to re-sprout. This means that nominee was capable of affecting the viability of dormant buds.

DISCUSSION

As mentioned before, the difficulty in controlling purple nutsedge is not only due to its extensive underground system of basal bulbs, rhizomes, roots and tubers but also because of its apical dominance system. Apical dominance is exhibited among the buds on a single tuber and also in the nutsedge plant system. This means that many dormant or inactive buds and entire tubers are not accessible to many foliarly applied herbicides and dormant tubers even tend to be tolerant to soil incorporated herbicides.

Table (6) : Number of re-sprouting buds of purple nutsedge tubers previously treated with either pre-emergence perfluidone or post-emergence nominee alone or in combination with 1 % urea after soaking the mother tubers in 50 ppm benzyle adenine (BA).

Treatments (ppm)	No. of re-sprouting buds/tuber
Control	3
250 perfluidone	1
500 "	2
750 "	2
250 " + 1 % urea	1
500 " + 1 % urea	1
750 " + 1 % urea	1
400 nominee	0
600 "	0
800 "	0
400 " + 1 % urea	0
600 " + 1 % urea	0
800 " + 1 % urea	0

Considering the fact that purple nutsedge belongs to the group of rapidly growing plants that possess C₄ photosynthetic characteristics (Elmore and Paul, 1983), effective control requires, either killing almost all tubers in the soil, or activating most of the dormant buds of the tuber to form shoots, so that the active growing shoots could provide a physiological active sink to the foliarly applied herbicides (Parker and Dean, 1972). Teo and Nishimoto, 1973; Rehm and El-Masry, 1976 and El-Masry and Rehm, 1977 a and b).

The results of the present investigation showed the effectiveness of the pre-emergence herbicide perfluidone and the post-emergence herbicide nominee on the growth as well as the propagative capacity of purple nutsedge. Moreover, the results showed also that the pre-emergence herbicide perfluidone alone or mixed with urea at the highest concentration (750 ppm + 1 % urea) or the post-emergence herbicide nominee alone or mixed with 1 % urea at the highest concentration (800 ppm and 800 ppm + 1 % urea), inhibited completely the formation of propagative capacity of *Cyperus rotundus*. Adding perfluidone to the soil with all concentrations used alone or with urea showed gradual increase in the germination of dormant buds of the mother tubers after 15 and 30 days from sowing. Moreover, soaking the mother tubers after 45 days in 50 ppm benzyl adenine showed that the dormant buds of the mother tubers were still capable of re-sprouting. This result adds more support to the results reported by Rincon and Warren (1979), Saad El-Din (1985) and Bendiren *et al.*, (1989) who reported that perfluidone could release the dormant buds of *Cyperus rotundus* from apical dominance. This means that perfluidone did not adversely affect the viability of the dormant buds of the tubers. On the other hand, the post-emergence herbicide nominee adversely affected the viability of dormant buds of the tubers since no buds could germinate after soaking the tubers in 50 ppm benzyl adenine. After 45 days from sowing the tubers were soft and decayed. These results are in accordance with those reported by Noldin, (1997), JinHao, *et al.*, (2000), Qiang *et al.* (2000), Moshtohry (2001), Covarelli, (2003) and Risi *et al.* (2004), who reported that the new post-emergence herbicide nominee is very effective in controlling annual as well as some perennial weeds.

The results showed also the superiority of using the post-emergence herbicide nominee when compared with the pre-emergence herbicide perfluidone in controlling *Cyperus rotundus*.

REFERENCES

- Bendiren, L.E.; S.A. Ramirez and K.U. Kim (1989). Breaking bud dormancy in mature tubers of yellow nutsedge (*Cyperus esculentus*) with metolachlor. Special Circular, Ohio Agricultural Research and Development Center No. 126, 6-10.
- Burke, S.T.I.; J.W. Wilcut; W.D. Smith and J. Burton (2003). Absorption, translocation and metabolism of foliar applied CGA-362622 in purple and yellow nutsedge (*Cyperus rotundus* and *C. esculentus*). Weed Sci. 51 : 13 – 18.

- Covarelli, G. (2003). The new herbicides. *Informatore Fitopatologico*, 53 : 1, 18 – 23.
- Derr, J.F. and J.W. Wilcut (1993). Control of yellow and purple nutsedge (*Cyperus esculentus* and *C. rotundus*) in nursery crops. *Weed Technol.* 7 : 112 – 117.
- Doll, J.D. and W. Piedrahita (1982). Effect of glyphosate on the sprouting of *Cyperus rotundus* L. tubers. *Weed Res.* 22 : 123 – 128.
- El-Masry, R. and S. Rehm (1977a). The effect of growth regulators and herbicides on purple nutsedge (*Cyperus rotundus* L.) III. The combined effect of morphactin CME 33170p and Dicamba. *Z. Acker u. Pflanzenbau*, 144 : 215 – 221.
- El-Masry, R. and S. Rehm (1977b). The effect of growth regulators and herbicides on purple nutsedge (*Cyperus rotundus* L.) IV. Effects of glyphosate and morphactin on the viability of tubers. *Z. Acker. u. Pflanzenbau*, 144 : 259 – 267.
- El-Masry, R.; F. Awad and S.A. Ibrahim (1980). Growth and cations content of purple nutsedge (*Cyperus rotundus* L.) as affected by soil characteristics. *Agrochimica* 24 (5) : 501 – 508.
- Elmore, C.D. and R.N. Paul (1983). Composite list of C₄ weeds. *Weed Sci.* 31 : 686 – 692.
- Grichar, W.J.; P.R. Nester and A.E. Colburn (1992). Nutsedge (*Cyperus* spp.) control in peanuts (*Arachis hypogaea*) with imazethapyr. *Weed Technol.* 6 : 396 – 400.
- Grichar, W.J.; B.A. Besler and K.D. Brewer (2003). Purple nutsedge control and potato (*Solanum tuberosum*) tolerance to sulfentrazone and halosulfuron. *Weed Technology* 17 : 485 – 490.
- Hauser, E.W. (1962). Establishment of nutsedge from space planted tubers. *Weeds*, 10 : 209 – 212.
- Hauser, E.W. (1971). Nutsedge : A worldwide plague. *Weeds Today*, 2 (1) : 21 – 23.
- Holm, L. and J. Herberger (1970). Weeds tropical crops. *Proc. British Weed Control. Conf.* 10 : 1132 – 1149.
- Holm, L.G.; D.L. Plucknett, J.V. Pancho and J.P. Herberger (1991). The world's worst weeds : Distribution and biology. Malabar, FL : Krieger Publ. 610 p.
- Horowitz, M. (1972a). Effect of frequent clipping on three perennial weeds, *Cynodon dactylon* (L.) Pers., *Sorghum halepense* (L.) Pers. and *Cyperus rotundus* L. *Expl. Agric.* 8 : 225 – 234.
- JinHao, He; X. Zhou; Y. Sun; Z. Ma; H. Bao; JH., H.; XJ.Zhou; Y.J. Sun; ZJ. Ma and H.Z. Bao (2000). Occurrence of weeds in early direct seeded rice fields and their control in Jinhua, Zhejiang. *Acta-Agriculturae-Zhejiangensis*, 12 : 6, 331 – 334.
- Messiha Nadia, K.; Sonna, H. El-J. and Sanaa A.R.M. (1993). The efficiency of basamid (dasomet) in controlling purple nutsedge (*Cyperus rotundus* L.) in two different egyptian soils. *Egypt. J. Appl. Sci.* 8 (1) : 369 – 380.
- Moshtohry, M.R. (2001). Performance of some new selective herbicides for solving weed problem in direct seeded Rice under flooding and dry sowing methods. *J. Agric. Sci. Mansoura Univ.*, 26 (1) : 43 – 50.

- Neeser, C.; R. Agüero, and C.J. Swanton (1997). Survival and dormancy of purple nutsedge (*Cyperus rotundus*) tubers. *Weed Sci.* 45 : 784 – 790.
- Noldin, J.A. (1997). Efficacy of herbicide bispyribac sodium for the control of weeds in irrigated rice. *Lavoura-Arrozeira*, 50 : 431 – 15 – 19.
- Parker, C. and M.L. Dean (1972). The effect of some growth regulators on the sprouting of *Cyperus rotundus* L. and its response to herbicide. *Proc. 11th Br. Weed Control Conf.* 744 – 751.
- Pereira, W.; G. Crabtree and R.D. William (1987). Herbicide action on purple and yellow nutsedge (*Cyperus rotundus* and *C. esculentus*). *Weed Technol.* 1 :92-98.
- Qiang, W.; X. Zhao; C. Wu; F. Dai; L. Wu; H. Xu; R. Zhang; G. Cai and X. Weng (2000). Application techniques of bispyribac. Sodium for controlling weeds in direct seeded rice fields. *Acta Agriculturae – Zhejiangensis*. 12 (6) : 338 – 344.
- Rehm, S. and R. El-Masry (1976). The effect of growth regulators and herbicides on purple nutsedge (*Cyperus rotundus*, L.). I. The effect of sprout and root formation of dormant tubers. *Z. Acker u. Pflanzenbau*, 143 : 98 – 108.
- Rincon, D.J. and G.F. Warren (1979). Effect of soil placement on the activity of herbicides on *Cyperus rotundus* L. *Weed Research*, UK, 19 (2) : 81 – 87.
- Risi, C.; G. Arcangeli; A. Cantoni and E. Campani (2004). Nominee (Bispyribac–sodium); a new post-emergence herbicide for rice. *Informatore-Fitopatologico*. 54 (3) : 44 – 49.
- Saad El-Din, Samia A. (1985). Effect of some growth regulators and herbicides on growth behaviour of purple nutsedge (*Cyperus rotundus*, L.). M. Sc. Thesis, Dept. of Agric. Botany and Plant Pathology, Faculty of Agriculture Cairo University.
- Snedecor, G.W. and W.G. Cochran (1967). *Statistical methods*. The Iowa State Univ., Iowa, U.S.A., Press, P. 593.
- Teo, C.K.H. and R.K. Nishimoto (1973). Cytokinin enhanced sprouting of purple nutsedge as a basis for control. *Weed Res.* 13 : 118 – 121.
- William, R.D. (1976). Purple nutsedge : tropical Scorge. *Hort. Science*, 11 : 357 – 364.
- Wills, G.D. and G.A. Briscoe (1970). Anatomy of purple nutsedge. *Weeds Sci.* 18 : 631 – 635.
- Wills, G.D. (1987). Description of purple and yellow nutsedge (*Cyperus rotundus* and *C. esculentus*). *Weed Technol.* 1 : 2-9.

**اثر كل من مبيد الحشائش البرفلويدون والنوميني منفردين او بخلط كل منهما
باليوريا على نمو وتكاثر حشيشة السعد
نادية خليل مسيحة
قسم النبات - المركز القومى للبحوث - الدقى - القاهرة**

اجريت هذه الدراسة بصوبة المركز القومى للبحوث خلال موسمين متتاليين (٢٠٠٣ - ٢٠٠٤) لدراسة اثر كل من مبيد الحشائش البرفلويدون بتركيزاته المختلفة (٢٥٠ ، ٥٠٠ ، ٧٥٠ جزء فى المليون) او النمينى بتركيزاته (٤٠٠ ، ٦٠٠ ، ٨٠٠ جزء فى المليون) اما منفردين او عند خلط كل منهما باليوريا (١ %) على نمو وتكاثر حشيشة السعد .

واظهرت النتائج قدرة كلا المبيدين بتركيزاتهما المختلفة اما منفردين او عند خلط كل منهما باليوريا (١ %) على تثبيط كل من المجموع الخضرى وكذا اعضاء التكاثر الارضية لحشيشة السعد. واطهرت النتائج ان استخدام التركيز العالى لمبيد البرفلويدون اما منفردا او عند خلطه باليوريا (١ %) وكذا التركيز العالى لمبيد النمينى منفردا او عند خلطه باليوريا (١ %) (٤٥ يوم من الزراعة) ادى الى تثبيط كامل لنمو اعضاء التكاثر الارضية لحشيشة السعد. وتم دراسة اثر كل من المبيدين على حيوية البراعم الساكنة على الدرنات الام (عمر ٤٥ يوم من الزراعة) وذلك بعد نقعها فى محلول ٥٠ جزء فى المليون من منظم النمو البنزيل ادنين . اوضحت النتائج ان المعاملة بمبيد الحشائش النمينى قد منع البراعم الساكنة من الانبات فى حين ان المعاملة بمبيد البرفلويدون لم يمنع البراعم الساكنة من الانبات . وهذه النتائج تظهر افضلية مبيد النمينى فى مقاومة حشيشة السعد

Table (2) : Effect of different concentrations of perfluidone alone or in combination with 1 % urea on the growth characters of mother and daughter shoots of purple nutsedge at different stages of growth (30 and 45 days from sowing) (combined analysis of two seasons).

Treatments Characters	Perfluidone concentrations (ppm)							
	Age days	Control	250	500	750	250 + 1% urea	500 + 1% urea	750 + 1% urea
No. of mother shoots/tuber	30	2.75	2.50	2.50	1.00	2.50	2.50	1.00
	45	3.00	2.00	1.50	1.25	1.50	1.00	1.00
No. of leaves of mother shoots/tuber	30	25.75	16.25	13.00	5.50	14.75	11.50	3.50
	45	32.00	15.75	9.75	5.75	11.00	7.00	5.75
Length of mother leaves (cm)	30	47.75	25.50	16.50	9.50	18.25	16.25	3.50
	45	72.50	34.75	30.25	21.75	33.50	22.25	10.25
No. of daughter shoots/tuber	30	5.75	0.00	0.00	0.00	0.00	0.00	0.00
	45	12.00	2.50	0.50	0.00	0.75	0.25	0.00
No. of leaves of daughter shoots/tuber	30	29.25	0.00	0.00	0.00	0.00	0.00	0.00
	45	75.00	12.00	2.50	0.00	5.00	1.25	0.00

Table (3) : Effect of different concentrations of perfluidone alone or in combination with 1 % urea on the growth characters of underground organs and dry weight of different organs of purple nutsedge at different stages of growth (30 and 45 days from sowing) (combined analysis of two seasons).

Treatments Characters	Perfluidone concentrations (ppm)							
	Age days	Control	250	500	750	250 + 1% urea	500 + 1% urea	750 + 1% urea
No. of rhizomes /tuber	30	5.75	0.00	0.00	0.00	0.00	0.00	0.00
	45	29.25	3.00	1.00	0.00	1.50	0.25	0.00
Length of rhizomes /tuber (cm)	30	54.75	0.00	0.00	0.00	0.00	0.00	0.00
	45	297.80	20.25	3.75	0.00	10.75	2.00	0.00
No. of newly formed propagative organs (basal bulbs and tubers/plant)	30	6.50	0.00	0.00	0.00	0.00	0.00	0.00
	45	29.50	3.00	1.00	0.00	1.50	0.25	0.00
Dry weight of foliage (g/plant)	30	2.05	0.20	0.10	0.05	0.10	0.05	0.05
	45	9.43	0.80	0.35	0.10	0.38	0.13	0.10
Dry weight of underground organs (g/plant)	30	0.95	0.05	0.05	0.05	0.05	0.05	0.05
	45	10.48	0.34	0.20	0.09	0.15	0.10	0.05
Total dry weight (g/plant)	30	3.00	0.25	0.15	0.10	0.15	0.10	0.05
	45	19.90	1.14	0.55	0.19	0.53	0.23	0.10

Table (4) : Effect of different concentrations of nominee alone or in combination with 1 % urea on the growth characters of mother and daughter shoots of purple nutsedge at different stages of growth (30 and 45 days from sowing) (combined analysis of two seasons).

Treatments Characters	Nominee concentrations (ppm)							
	Age days	Control	400	600	800	400 + 1% urea	600 + 1% urea	800 + 1% urea
No. of mother shoots /tuber	30	2.75	2.75	2.75	2.50	2.50	2.50	2.50
	45	3.00	2.00	2.00	2.00	1.25	1.00	1.00
No. of leaves of mother shoots/tuber	30	25.75	17.75	16.75	14.75	17.75	16.00	13.50
	45	32.00	14.50	13.00	11.75	7.75	6.00	5.50
Length of mother leaves (cm)	30	47.75	28.75	28.00	27.50	27.75	27.25	27.00
	45	85.00	29.75	28.25	25.75	25.75	22.50	16.50
No. of daughter shoots /tuber	30	5.75	0.00	0.00	0.00	0.00	0.00	0.00
	45	12.00	0.50	0.00	0.00	0.00	0.00	0.00

No. of leaves of daughter shoots/tuber	30	29.25	0.00	0.00	0.00	0.00	0.00	0.00
	45	75.00	3.00	0.00	0.00	3.00	0.00	0.00

Table (5) : Effect of different concentrations of nominee alone or in combination with 1 % urea on the growth characters of underground organs and dry weight of different organs of purple nutsedge at different stages of growth (30 and 45 days from sowing) (combined analysis of two seasons).

Treatments Characters	Nominee concentrations (ppm)							
	Age days	Control	400	600	800	400 + 1% urea	600 + 1% urea	800 + 1% urea
No. of rhizomes /tuber	30	5.75	1.50	0.00	0.00	0.50	0.00	0.00
	45	29.25	0.50	0.25	0.00	0.50	0.00	0.00
Length of rhizomes /tuber (cm)	30	54.75	4.75	0.00	0.00	1.25	0.00	0.00
	45	297.80	3.25	0.75	0.00	1.75	0.00	0.00
No. of newly formed propagative organs (basal bulbs and tubers/plant)	30	6.50	3.00	0.00	0.00	1.50	0.00	0.00
	45	30.25	0.50	0.25	0.00	0.50	0.00	0.00
Dry weight of foliage (g/plant)	30	2.05	0.30	0.30	0.20	0.30	0.30	0.20
	45	9.43	0.25	0.18	0.15	0.25	0.15	0.15
Dry weight of underground organs (g/plant)	30	0.95	0.38	0.20	0.09	0.20	0.10	0.09
	45	10.48	0.13	0.10	0.10	0.13	0.10	0.09
Total dry weight (g/plant)	30	3.00	0.68	0.50	0.29	0.50	0.40	0.29
	45	19.90	0.38	0.28	0.25	0.38	0.25	0.24