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2011

OM₁

OM₀
 (Split Plot Design)
 CFI :
 APFI_i ,
 APFI_v ,
 APFI_f ,
 APFI_m ,
 APFI

%60-50

()

1- 800
 % 42 35 35 21 37
 . APFI APFI_m APFI_f APFI_v APFI_i

500

Helianthus annuus L.

(%60)

(2003 FAO)
 Pitman) % 92
 % 40 (2008
 %65
 2002 Läubli
 %60
 (2000) Loveys
 %50
 (2008) Marsal
 (*Helinthus annuus* L.)
 1990 Putnam)
 (2009
 %35
 (2009 1981)
 Putnam)
 (2009 1990
 (1999 Alam Rogers)¹ . 965.2 203.2
 (1979) Kassam Doorenbos
¹⁻ . 1000
 (2009) Chen (1976 Hoffman Mass)
 %1.8 ¹⁻ . 6.3
¹⁻ . 6.3 ¹⁻ . 1
 .
 Demir (2009 Kazemeini 2002 McCarthy) .
 (2006)
 Nasri
 (2010)
 .
 Abd El- Ibrahim)
 (2009 Samad

36
 3
 2
 3 × 6² 18
 6
 0.75
 0.2
 0.5
 0.02
 0.032
 0.05
 Split)
 Flame
 (plot design
 2011/8/1
 0.3
 1-
 44444
 1-
 P 80
 1- N 200
 0.75
 (%21 P₂O₅)
 (%46 N)
 K 100 (%41.5 K)
 .(2012)
 1-
 :
 :
 -1
 .Continuous Furrow Irrigation :CFI
 Alternate Partial Furrow : APFI
 Irrigation
 (initial) :APFI_i
 vegetative) :APFI_v
 (flowering) :APFI_f
 grain) :APFI_m
 (maturity
 :
 -2
 .OM₀ .I
 .OM₁ .II
 40) K₂O P₂O₅ N 10
 Italpollina
 .(1- . 40 40

Gravimetric Method

0.6 Auger 0.3 - 0

%60-50

Allen) (1998):

$$d = (\theta_{fc} - \theta_w) \times D \quad (2)$$
 where θ_w is the water content, θ_{fc} is the field capacity, and D is the depth of the auger. d is the depth of the soil layer.

(1982) Eldabas and Elshookie:

$$LA = 0.65 \sum W^2 \quad (3)$$
 where LA is the layer analysis, $\sum W^2$ is the sum of the squares of the weights of the soil layers, and W is the weight of the soil layer.

CFI 793 (OM₁)
 807 (OM₀)
 569 OM₀
 578

21 37
 CFI APFI APFI_m APFI_f APFI_v APFI_i % 42 35 35

.2

1-	1-			
	OM ₁	OM ₀		
800	793	807	16	CFI
506.5	503	510	10	APFI _i
633.5	628	639	13	APFI _v
522.5	519	526	10	APFI _f
518.5	514	523	10	APFI _m
460.5	457	464	9	APFI
	569	578		

3

CFI 1- 1.172 1.072 1.086 1.065 1.059 1.078
 APFI APFI_m APFI_f APFI_v APFI_i

CFI % 42.50 20.8

CFI

C₄S₁

(1987)

(2004 Ozturk)

.3

1-	2		()			
	OM ₁	OM ₀	OM ₁	OM ₀		
0.547	0.641	0.453	1.078	1.123	1.033	CFI
0.534	0.598	0.469	1.059	1.073	1.046	APFI _i
0.442	0.459	0.426	1.065	1.077	1.053	APFI _v
0.538	0.569	0.507	1.086	1.109	1.064	APFI _f
0.532	0.530	0.533	1.072	1.083	1.062	APFI _m
0.644	0.648	0.641	1.172	1.191	1.153	APFI
N.S	0.194		N.S	N.S		LSD _(0.05)
0.539	0.574	0.505	1.089	1.109	1.068	
	0.037			0.02		LSD _(0.05)

Compatible organic)

(solutes

.(2009)

(4)

1228 OM₀
(2006) Munir

OM₁

¹⁻

1320

%7.49

¹⁻

(2012)

.4

	()		()			
	OM ₁	OM ₀	OM ₁	OM ₀	OM ₀	
1289	1380	1198	20.75	21.70	19.80	CFI
1294	1324	1263	20.85	21.10	20.60	APFI _i
1253	1260	1246	20.15	20.40	19.90	APFI _v
1185	1224	1146	20.70	20.80	20.60	APFI _f
1293	1408	1177	20.10	19.80	20.40	APFI _m
1330	1324	1336	21.80	21.90	21.70	APFI
N.S	N.S.		N.S	N.S.		LSD _(0.05)
1274	1320	1228	20.73	20.95	20.5	LSD _(0.05)
	N.S.			N.S.		

500

(5)

¹⁻

32.01 30.24, 32.64, 30.38, 29.12, 29.94 500

APFI APFI_m, APFI_f, APFI_v, APFI_i, CFI
500

500

.5

	(¹⁻)		() 500			
	OM ₁	OM ₀	OM ₁	OM ₀	OM ₀	
3420	3575	3266	29.94	29.20	30.67	CFI
3346	3394	3299	29.12	28.86	29.39	APFI _i
3365	3409	3322	30.38	30.48	30.27	APFI _v
3398	3438	3357	32.64	31.70	33.59	APFI _f
3419	3488	3349	30.24	28.29	32.19	APFI _m
3769	3776	3761	32.01	32.10	31.92	APFI
N.S.	N.S.		N.S.	N.S.		LSD _(0.05)
3453	3513	3392	30.72	30.10	31.34	LSD _(0.05)
	68.7			N.S.		

500

(2006) Munir

(5)

3769 3419 3398 3365 3346 3420

APFI APFI_m, APFI_f, APFI_v, APFI_i, CFI

1-

(2004)

Ozturk

1- 3513

1- 3392

OM₁

OM₀

%3.57

OM₁

(1990 Abrol Gupta)

(2010)

(2009)

%43

.2008 .

.2009 .

.()

.2009 .

.2009 .

.*Helianthus annuus* L.

.107-95 :(1)1 .

.1981 .

.2012 .

.202. . .

- () .1987 .
 .318
 .2012 .
- Helianthus annuus*
 .137-130 :(2)4 . .L
 .2010 .
- NPK
 .102-91. :(4)8 .
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EFFECT OF ALTERNATE PARTIAL FURROW IRRIGATION AND ORGANIC MATTER ON APPLIED WATER DEPTH AND YIELD OF SUNFLOWER.

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ABSTRACT

A field experiment was carried out during the autumn season 2011 in Alrashid District southern of Baghdad to assess the impact of water shortages when applying Alternate partial furrow irrigation and organic matter during growth stages of sunflower compared with Conventional furrow irrigation on the growth and yield of sunflower. The experiment was conducted at two levels of organic fertilizers (with and without organic fertilizer). The experiment was designed according to Randomized Complete Block Design (RCBD) Split Plot Design with three replications. The experiment included six treatments: Conventional furrow irrigation (CFI), Alternate partial furrow irrigation during growth stages except initial stage the conventional irrigation was applied (APFI_i), Alternate partial furrow irrigation during growth stages except the vegetative growth stage the conventional irrigation was applied (APFI_v), Alternate partial furrow irrigation during growth stages except the flowering stage the conventional irrigation has been applied (APFI_f), Alternate partial furrow irrigation during growth stages except phase composition of winning stage the conventional irrigation has been applied (APFI_m) and finally Alternate partial furrow irrigation during all growth stages of sunflower (APFI). The treatment of irrigations was distributed on the main plot randomly while the treatment of manure was distributed on secondary plot. The depth and time of irrigation were identified depending on the attrition of soil moisture by assessing the moisture content until the depletion of 50-60% of available water. The equation of water balance was used to determine depth of water for each stages of plant growth (initial, vegetative growth, flowering, grain maturity). The results showed that the depth of irrigation water differ depending on irrigation methods and levels of organic manure. The average depth of irrigation water for two levels of manure were 800 mm.season⁻¹ for the CFI, but when Alternate partial furrow irrigation applied the depth of water decreased at 37, 21, 35, 35 and 42% for APFI_i, APFI_v, APFI_f, APFI_m, and APFI respectively. No significant differences among the irrigation treatments in high plant, leaf area, head diameter, number of seeds, weight of 500 seeds and seeds yield. This means that partial irrigation did not reduce sunflower growth factors when followed Alternate partial furrow irrigation.

Key words: Alternate partial furrow irrigation, Organic manure, Water balance equation, *Helianthus annuus* L, ground water.