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Doğu ve Güneydoğu Anadolu'da Taze Tavuk Gübresinin Solarizasyonunun Yabancı Otlanmaya Etkileri

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Özet

Bu çalışmada, tınlı-killi yapıdaki arazide taze tavuk gübresinin 45 günlük bir solarizasyon ile birlikte yabancı otlanmaya etkisi araştırılmıştır. Yapılan toprak üstü sıcaklık (C°) ölçümlerinde, 0 (Kontrol), 6 kg/m² taze tavuk gübresi, 12 kg/m² taze tavuk gübresi, solarizasyon, "0, 6 kg/m² taze tavuk gübresi + solarizasyon" ve "12 kg/m² taze tavuk gübresi + solarizasyon" uygulamaları kontrole göre, sırasıyla 9, 11, 16, 17 ve 18 C° sıcaklık artışları olmuştur. Kontrole göre en fazla sıcaklık artışı görülen "12 kg/m²+ solarizasyon" kombinasyonu ile 10, 20 ve 30 cm toprak derinliklerinde sırasıyla 12, 12 ve 10 C° sıcaklık artışları elde edilmiştir. Solarizasyondan hemen ve 6 ay sonra yapılan yabancı ot sayımlarında (adet/m²), taze tavuk gübresi uygulaması ile toplam yabancı ot sayısı azalmıştır. Solarizasyon yapılan ana parsellerde yapılmayanlara göre yabancı otlanma yaklaşık olarak % 73 oranında azalmış, sonuçlar % 1 hata payına göre önemli çıkmıştır. Kombinasyonların ele alındığı ikinci sayımda en az yabancı ot sayısı metre karede 2 adet ile "12 kg/m² taze tavuk gübresi + solarizasyon" uygulamasında elde edilmiş ve yalnız solarizasyona göre %60, yapılmayan kontrole göre ise yabancı otlanma % 94 oranında azalmıştır. Taze tavuk gübresi solarizasyon ile birlikte uygulandığında sıcaklık daha da artmakta ve yabancı ot çimlenmesi ve gelişmesini engellemektedir.

Anahtar kelimeler: *Solarizasyon, Taze tavuk gübresi, Yabancı ot yoğunluğu*

The Effect of Solarization with Fresh Chicken Manure on Weed Density in Eastern and Southeastern Anatolia

Abstract

The study was conducted on loamy-clay soil to evaluate the effects of fresh chicken manure and solarization on weed density in Dicle University experimental area during 2010 and 2011. The effects of 45 days solarization and the fertilize with chicken manure to the soil at the rate of 0 (Control), 6 and 12 kg/m2 and their combination on weed density were studied. The temperatures were measured with a which were placed at the 5, 10, 20 and 30 cm soil depths in plots. The temperatures were recorded as 9 , 11 and 16 C in the 6, 12 and 0 kg/m2 fresh chicken manure applied plots respectively and ?, 17 and 18 C in 6, 12 and 0 kg/m2 fresh chicken manure applied and solarized plots respectively. Maximum temperature increase was measured for 12 kg/m2 fresh chicken manure + solarization application where 12 °C at 10 and 20 cm depth and 10 °C at 30 cm of soil depth. Weed density (plant/m²) determined in two different time first has been performed right after solarization and the other was 6 months later. The number of weeds decreased by the application of fresh chicken manure. The combination of solarization significantly decreased weed densities (73%). Based on 6 month after application minimum weed density was recorded as 1.31 number per square meter for 12 kg/m² fresh chicken manure + solarization. Weed density reduction was approximately 94% compare to the control plots. Solarization alone reduced 60% weed density comparing to the control. Results showed that before crop planting the application of fresh chicken manure will increase soil temperature and if it combine with solarization will enhance temperature thus weeds would not be able to germinate and grow.

Key Words: *Solarization, Fresh chicken manure, Weed density*

Introduction

Crop growing and yield may highly affected by soilborne diseases and weeds. Crop rotation and soil sterilization are most important ways to prevent yield loss. It is known that sterilization can be made by fumigants or solarization since fumigants have negative effects on environment such as cause to the damage on the ozone layer, Methyl- bromide, which is commonly used one among these chemicals banned after 2005 in the most of developed countries (Katan, 1999). Instead of fumigation Soil solarization is a term that refers to disinfestations of soil by the heat generated from trapped solar energy will be more beneficial and safe (Katan, 1987).

Soil solarization alleviate temperature and helping to kill soil borne disease by covering soil surface with plastic cover and also, on broiler days of the year for a period of one or two months and that weed seed ger-

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mination are diminished by the way of thermal inactivation (Tekin and Cimen, 2001; Lalitha *et.al*., 2001; Hassing *et.al*., 2004; Cimen *et.al*., 2010 a; Cimen *et.al*., 2010 c). By the soil solarization, it has been recognized that temperature may differ from 5 to 9ºC between solarized and nonsolarized area (Ragon and Vilson, 1985) and its effect continues on second and third years (Cimen *et.al*., 2009: Cimen *et.al*., 2010 b).

In order to enhance the effect of solarization some other applications can be combined such as farm manure (Benlioglu *et.al*., 2005; Boz, 2009; Asa and Kadıoglu, 2009). All these additional applications would positively affect plant growing and increase crop yield.

Present study aimed to show how solarization and its combination with fresh chicken manure would effect weed density.

In intensive cultivation, the most important problem is the decrease of growing crops resulted from causes of soil borne disease and weeds. This problem can be prevented by means of rotation and chemical soil sterilization. But, it is known that these fumigants used have negative effects on the environment. It has been proposed that Methyl- bromide, which is commonly used one among these chemicals, should be abandoned entirely by the year 2005 in developed countries because of the damage it has caused on the ozone layer (Katan, 1999). It is possible and beneficial to use solar energy, a practice referred to as "soil solarization", instead of fumigation. Soil solarization is a term that refers to disinfestations of soil by the heat generated from trapped solar energy (Katan, 1987).

For the purpose of making soil warmed up and pasteurized with the help of this method called as solarization, it is enabled that causes of soil borne disease are diminished by the way of covering soil with plastic on broiler days of the year for a period of one or two months and that weed seed germination are diminished by the way of thermal inactivation (Tekin and Cimen, 2001; Lalitha *et.al*., 2001; Hassing *et.al*., 2004; Cimen *et.al*., 2010 a; Cimen *et.al*., 2010 c). In terms of soil solarization, it has been recognized that temperature difference from 5 to 9ºC between solarized and nonsolarized area is enough (Ragon and Vilson, 1985) and its effect continues on second and third years (Cimen *et.al*., 2009: Cimen *et.al*., 2010 b).

In order to lift the effectiveness of solarization, it is allowed with some applications, as farm manure is being in the first place (Benlioglu *et.al*., 2005; Boz, 2009; Asa and Kadıoglu, 2009). All these changes can affect the plant growing positively and conduce to the increase in yield in plants.

In this study, the effect of solarization, carried out after fresh chicken manure has been implemented on soil, on weed density has been researched.

Materials and Methods

Study was carried out with loamy-clay soil at Dicle University experimental area. The 0.02 mm thickness polythene cover sheet material used for solarization and soil temperature was measured by digital soil thermometer. Also fresh chicken manure was used which was provided by Gün Poultry Firm, in Diyarbakır. The experimental design was main plot with or without solarization and subplots were with or without fresh chicken manure with four replications as randomized split plot.

The polythene of 0.02 mm thickness used as a cover sheet material for solarization application and digital soil thermometer was used to measure the soil temperature. The experiment conducted as the main plot applied solarization and non-solarization, fresh chicken manure and non ones parcels were subplots with four repetitions according to the split-plot designs-random model.

Soil Preparation and Solarization

Experiments were performed on pre irrigated then deeply tilled plots in August, 2011. Fresh chicken manure at rate of 0, 6 and 12 kg/m^2 was mixed to the soil and irrigated with sprinkler (Fig.1a). Following irrigation subplots were covered with 0.02 mm polyethylene cover for solarization during August 17, 2010 and September 30, 2010 (Fig. 1b). Temperature was measured in the soil depth of 5, 10, 20 and 30 cm, on different dates for 24 hours of the day with digital thermometer. Maximum temperatures are presented in Table 1.

Weed density

To determine density weeds were counted twice. First counting was performed one week after solarization (Fig. 1c). Then the first weed counting, nonsolarized plots with growing weeds were tilled while solarized areas weren't tilled, the second weed counting of all plots were approximately 4 months after tilling (30. March, 2011) (Fig. 1d). Counting performed for four different directions on each plot, 1 m indent from the edge and on the area of 1 m^2; based on this, numbers of weed types detected (number/m^2) were given in Table 2 and 3.

In the first week of the month August of the year 2010, experimental area was irrigated at first, then tilled deeply in field capacity and chicken manure (0, 6 and 12 kg/m^2) was mixed with soil, and lastly sprinkler irrigation was performed (Fig. 1a). Afterwards, sub-parcels were covered hermetically with transparent white polyethylene cover in 0.02 mm thickness and solarization process was carried from 17. August, 2010 and 30, September, 2010 (Fig. 1b). During solarization, temperature measurement was performed by using digital thermometer in the soil depth of 5, 10, 20

and 30 cm, on different dates and 24 hours of the day. Measured maximum values were presented in Table 1.

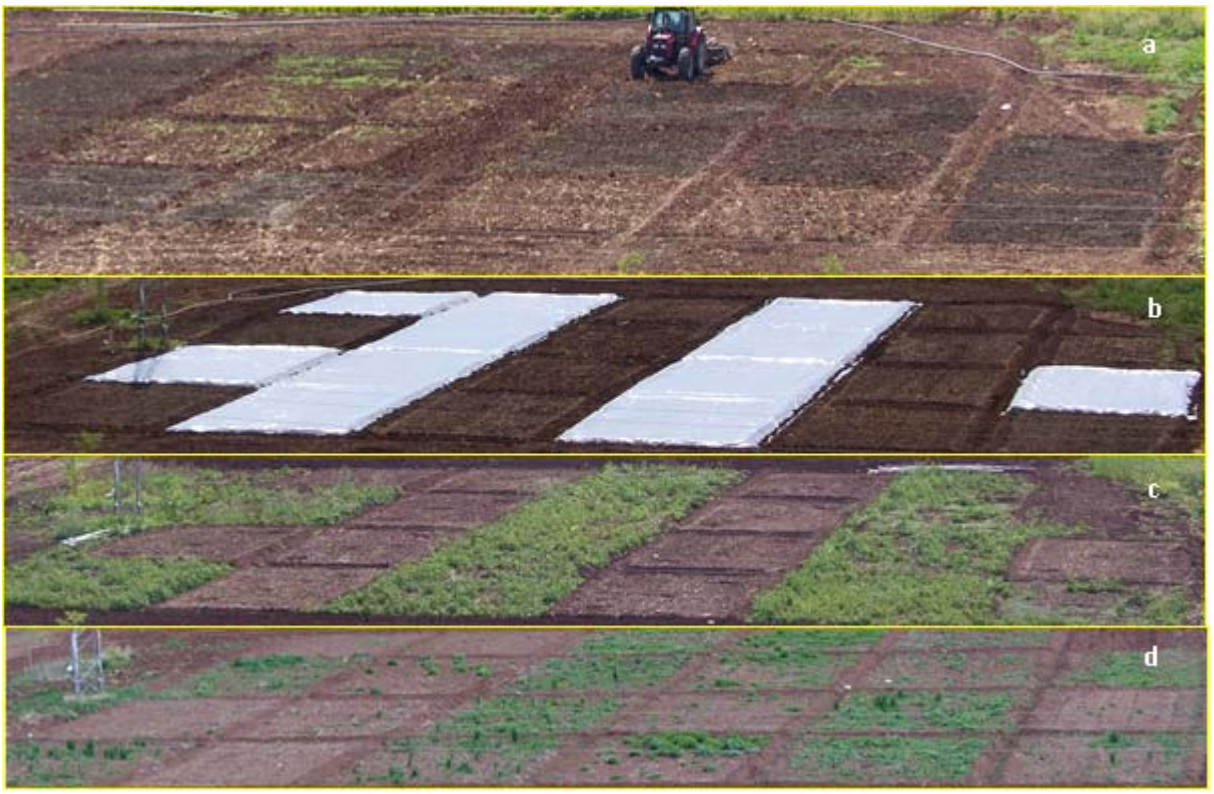

Fig. 1. The stages for effect of solarization with fresh chicken manure on weed density; (a) mixing fresh chicken manure with soil, (b) application of soil solarization in the experimental plots (Photo: August 27, 2010), (c) the first counting weeds (Original Photo: September 10, 2010), (d) the second counting weeds after 4 months tilling solarized parcels (Original Photo: March 3, 2011).

Table 1: The effect of different treatments (2010)

Treatments	**Soil Temperature (Max ºC)**			
Soil depth	5 cm	10 cm	20 cm	30 cm
Non solarized	46	27	27	27
6 kg/m^2 fresh chicken manure	55	28	29	28
12 kg/m^2 fresh chicken manure	57	29	31	30
Solarized	62	36	35	34
6 kg/m^2 fresh chicken manure + solarized	63	40	38	36
12 kg/m^2 fresh chicken manure + solarized	64	39	39	37

Counting Weeds

Weed counting was carried out two times. First counting was performed one week later than the solarization process had been ended (Fig. 1c). After first weed counting, nonsolarized parcels with growing weeds were tilled although solarized areas weren't tilled, and then second weed counting process on all of parcels was performed approximately 4 months after tilling (30. March, 2011)(Fig. 1d). Counting processes were performed on each parcel as from four different directions, 1 m indent from the edge and on the area of 1 m^2; based on this, numbers of weed types detected (number/m^2) were given in Table 2 and 3.

Statistical analysis

Data were subjected to Analysis of variance (ANOVA) by usin MSTATC.

Results and Discussion

Effect of fresh chicken manure and solarization on soil temperature

Based on results temperature increased by dose increment in fresh chicken manure on non solarized

plots compare to the untreated control. These increments were 9, 1, 2 and 1º C for "6kg/m^2 Fresh Chicken Manure" application, in the soil depths of 5 cm, 10 cm, 20 cm and 30 cm, respectively. The application of "12 kg/m2 Fresh Chicken Manure" temperature were increased as 11, 2, 4 and 3 ºC (Table 1) at same soil depths compare to the control treatment.

Solarization alone increased soil temperature as 16, 9, 8 and 7 ºC in the soil depths for 5 cm, 10 cm, 20 cm and 30 cm respectively comparing to the control plots. In order to increase more solarization combined with fresh chicken manure application. Temperature has been increased 17, 13, 11 and 9 ºC for the same soil depths with 6kg/m2 Fresh Chicken Manure + Solarization combination compare to the control. As the amount of manure increased temperatures were increased also. By the application of 12kg/m2 fresh chicken manure + solarization" combination measured temperatures were increased as 18, 12, 12 and 10 ºC for the same soil depth comparing to the control (Table 1).

Table 2. Effect of fresh chicken manure on weeds density (The first weeds counting, number/m^2)

Species of weeds	Treatments		
	Control	**Fresh chicken manure (6kg/m^2)**	**Fresh chicken manure (12 kg/m^2)**
Xanthium strumarium (Big cocklebur) *	4.875 **A**	1.500 **B**	1.825 **B**
Physalis sp. (Ground-cherry) *	1.688 **A**	0.250 **B**	0.313 **B**
Sorghum halepense (Johnsongrass)	14.188	5.750	4.563
Sinapsis arvensis (Wild mustard)	0.688	0.000	0.000
Convolvulus arvensis (Field bindweed)	1.063	0.438	0.000
C.galaticus Rostan ex Choisy(Wildmorningglory)	2.750	2.063	11.313
Lolium sp. (Darnel)	0.438	0.000	0.000
Solanum nigrum (Black night shade)	0.125	0.000	0.063
Heliotropium europaeum (European heliotrope) *	0.000 **B**	0.000 **B**	0.750 **A**
Amaranthus blitoides (Prostrate pigweed)	0.438	0.688	0.063
Cichorium intybus (Common chicory)	0.500	0.188	0.000
Lactuca serriola (Prickly lettuce)	0.637	0.000	0.000
Total	**27.390**	**10.877**	**18.764**

**, ** Significant at 0.05 and 0.01 levels respectively*

As based on the measurements carried out, it was seen that temperature had been increased by dose increment in fresh chicken manure applications with non solarized plots, compared to the control concerning unapplied one. These increments occur as 9, 1, 2 and 1º C for "6kg/m^2 Fresh Chicken Manure" application, in the soil depths of 5 cm, 10 cm, 20 cm and 30 cm. As for "12 kg/m2 Fresh Chicken Manure" application, according to the control in the same soil depths, temperature increments have been detected as 11, 2, 4 and 3 ºC (Table 1).

According to the control with solarization solely, temperature increased 16, 9, 8 and 7 ºC in the soil depths of 5 cm, 10 cm, 20 cm and 30 cm. The temperature increased further by solarization carried out after fresh chicken manure had been mixed the soil. These increments were 17, 13, 11 and 9 ºC respectively in the same soil depths as based on the control together with the combination of "6kg/m2 Fresh Chicken Manure + Solarization" and also, temperature increment of 18, 12, 12 and 10 ºC occurred within the scope of "12kg/m2 fresh chicken manure + solarization" (Table 1).

Results we have obtained adjust with similar studies in terms of the finding that 5-9 ºC temperature difference is enough together with solarization solely and this result is higher than the one acquired within the scope of a former study (Ragon and Vilson, 1985) carried out (Lalitha *et.al*., 2001; Hassing *et.al*., 2004; Benlioglu *et.al*., 2005; Cimen *et.al*., 2010 a;). However, with the solarization, temperature values may haven't reached at which are expected to get on clayey-cold soil and at the end of summer. Soil temperature increased more by the combination of fresh chicken manure with solarization. This finding is also in accordance with the similar two studies carried out on greenhouse (Boz, 2009) and on open field condition (Benlioglu *et.al*., 2005) which fresh chicken manure is applied in combination with solarization in both.

The Effect of Fresh Chicken Manure and Solarization on Weed Density

First weed counting results were presented in Table 1 and Figure1c. Since weeds were not able to germinate in solarized plots weeds counted at non-solarized plots. Weed species such as *Xanthium strumarium* (Common cocklebur), *Physalis* sp. (Ground-cherry) and *Sorghum halepense* (Johnsongrass) has not been found where fresh chicken manure applied,

So the counting results were resulted in significantly different.

Among climbing or creeping herbaceous perennial weeds, *Convolvulus arvensis* (Field bindweed) decreased on fresh chicken manure applied plots; however, other creeping type *Convolvulus galaticus* Rostan ex Choisy (Wild morningglory) increased with application of which 12 kg fresh chicken manure to the soil as per square meter. Total weed number was decreased by the application of fresh chicken manure (Table 2, Figure 2.).

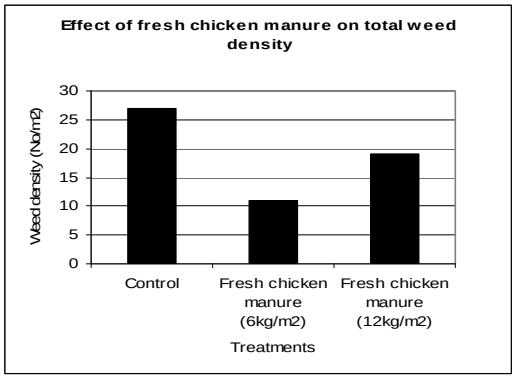

Fig 2. Effect of fresh chicken manure on total weed density (The first counting weed)

Table 3a. Effect of fresh chicken manure and solarization on main plots for weeds density (The second weeds counting, number/m^2)

Species of weeds	Treatments	
	Non solarized	Solarized
Sinapsis arvensis (Wild mustard) **	1.771	0.000
Convolvulus arvensis (Field bindweed)	1.113	0.417
Convolvulus galaticus Rostan ex Choisy. (Wild morningglory)*	1.313	1.000
Sorghum halepense (Johnsongrass)*	5.500	0.000
Taraxacum officinale (Common dandelion)	0.292	0.000
Cichorium intybus (Common chicory)	0.021	0.000
Galium tricornutum (Rough bedstraw)**	4.417	0.000
Myagrum perfoliatum (Gold of pleasure)**	4.104	0.000
Lactuca serriola (Prickly lettuce)**	1.875	0.063
Carduus pycnocephalus (Italian thistle)	0.104	0.000
Coriandrum tordylium (Wild coriander)	0.479	0.000
Vicia sativa (Common vetch)	0.105	4.230
TOTAL **	**21.094**	**5.640**

* , ** Significant at 0.05 and 0.01 levels respectively

It can be concluded from the results that increased temperature may prevent or reduce weed seed germination. Previous studies stated that chicken manure had a great contribution to reproduction of *Trichoderma (Gliocladium) virens* which synthesized virodiol acting as mycoherbicide (Hutchınson, 1999). One of the important findings of the study is *Convolvulus galaticus* (Wild morningglory) which has been found during weed count is an endemic plant for Turkey (Davis, 1965).

Second counting results that performed 6 months later than solarization and 4 months later than cultivation (March 30, 2011), similar to the first one. The results second weed counting are presented Table 3a, Table 3b and Table 3c. Based on second counting results the number of weed species (number/ m2) decreased in main plots which solarization had been applied, compared to the non solarized plots. Among these weed species, *Sorghum halepense* (Johnsongrass), *Galium tricornutum* (Rough bedstraw), *Myagrum perfoliatum* (Gold of pleasure), *Sinapsis arvensis* (Wild mustard), and *Lactuca serriola* (Prickly lettuce) densities significantly decreased (Table 3a). When compared to the solarized plots to the non solarized, total weed number per unit area (number/m^2) was decreased approximately 73% and these reductions were statistically significant (P<0.0l) (Table 3a). Results obtained from study are in agreement with previous stuies (Lalitha *et.al*., 1985; Benlioğlu *et.al*., 2005; Cimen *et.al*., 2010 a).

Compare to the control plots weed densities of fresh chicken manure applied plots were highly decreased (Table 3b).

Results of second weed counting shoved that the highest number of weed per unit area (number/m^2) were counted on control (22.085 number/m^2) plots, and followed by the 12 kg/m^2 fresh chicken manure application (21.839 number/m^2) then "6 kg/m^2 fresh chicken manure" (17.804 number/m^2). In addition to

the fresh chicken manure application, weed density was considerably diminished by solarization combination (8.941 number/m^2). Based on these combinations, the number fallen down to 4.877 by "6 kg/m^2 fresh chicken manure + solarization" and minimum weed number with the value of 1.313 number/ m^2 by the combination of "12kg/m^2 fresh chicken manure + solarization" was acquired (Table 2c and Figure 3). On the other hand, weed density decreased 60% by solarization application and reached at the rate of 94% by "12 kg fresh chicken manure/m^2 + solarization" application. At field conditions any other study formerly carried out about the effect of solarization in combination with fresh chicken manure in different doses on weed density has not been encountered yet.

Table 3b. Effect of fresh chicken manure and solarization on sub- plots for weeds density (The second weeds counting, number/m^2)

Species of weeds	**Treatments**		
	Control	**Fresh chicken manure (6kg/ m^2)**	**Fresh chicken manure (12 kg/m^2)**
Sinapsis arvensis (Wild mustard)	1.281	0.750	0.625
Convolvulus arvensis (Field bindweed)	0.938	1.063	0.294
Convolvulus galaticus Rostan ex Choisy (Wild morningglory)***	0.907 **B**	0.438 **B**	2.125 **A**
Sorghum halepense (Johnsongrass)	3.063	2.344	2.844
Taraxacum officinale (Common dandelion)	0.250	0.063	0.125
Cichorium intybus (Common chicory)	0.000	0.031	0.000
Galium tricornutum (Rough bedstraw)	2.063	2.063	2.813
Myagrum perfoliatum (Gold of pleasure)	1.969	1.625	1.719
Lactuca serriola (Prickly lettuce)	1.156	0.875	0.875
Carduus pycnocephalus (Italian thistle)	0.094	0.063	0.000
Coriandrum tordylium (Wild coriander)	0.375	0.344	0.000
Vicia sativa (Common vetch)	3.907	1.969	0.656
TOTAL	**16.003**	**11.618**	**12.076**

** , ** Significant at 0.05 and 0.01 levels respectively*

Our results are similar to the (Boz, 2009) which conducted in to the greenhouse and (Benlioglu *et.al*., 2005) that conducted at field. Both researchers found that burned chicken manure combination with solarization helps to increase effect as present study proposed.

The results concerning first weed counting process performed one week later than the solarization process had been ended and were given in Table 2 and also illustrated in Figure 1c. At this stage, weeds have not been found yet on solarized plots. So, weeds counting were performed only on non-solarized parcels. As a result of counting process, it is recognized that the numbers of tall weeds such as *Xanthium strumarium* (Rough Cocklebur), *Physalis* sp. (Ground-cherry) and *Sorghum halepense* (Johnsongrass) diminished on parcels which fresh chicken manure had been applied to, and also the counting results related to the first two ones among these three weed species were found significant statistically.

Among climbing or creeping herbaceous perennial weeds, *Convolvulus arvensis* (Field bindweed) decreased on parcels which fresh chicken manure had been applied to; however, other creeping type *Convolvulus galaticus* Rostan ex Choisy (Wild morningglory) increased more within the scope of application which 12 kg fresh chicken manure had been put mixed the soil as per square meter. Total weed number was diminished by the application of fresh chicken manure (Table 2, Figure 2.).

At this point, germination of weed can be prevented as the result that fresh chicken manure has caused soil temperature to increase. Moreover, in a former study, it was stated that chicken manure had made a contribution to the reproduction of *Trichoderma (Gliocladium) virens* and also this fungus synthesized virodiol acting as mycoherbicide (Hutchınson, 1999). The result obtained by the counting process of *Convolvulus galaticus* (Wild morningglory) has shown that it is an endemic plant in Turkey and the number reached at the end of counting process has become high as based on the fact that it is a perennial plant having deep root underground and a creeping trunk (Davis, 1965).

In second weed counting process performed 6 months later solarization application and 4 months later cultivation (March 30, 2011), in a similar way occurred in the first counting process, The results concerning second weed counting process are presented Table 3a, Table 3b and Table 3c. Based on count-

ing processes carried out, the number of weed species (number/ m2) decreased in main parcels which solarization had been applied, compared to the ones on which solarization was not performed. Among these weed species, the ones decrease to be seen at the utmost are respectively; *Sorghum halepense* (Johnsongrass), *Galium tricornutum* (Rough bedstraw), *Myagrum perfoliatum* (Gold of pleasure), *Sinapsis arvensis* (Wild mustard), and *Lactuca serriola* (Prickly lettuce); and their numbers were found significant statistically (Table 3a). When compared to the parcels which solarization has not been applied to, total weed number per unit area (number/m^2) was decreased approximately at the rate of 73% in main non solarized plots, and concerning results were found significant (P<0.0l) (Table 3a).

Table 3c. Effect of fresh chicken manure and solarization on combinations for weed density (The second weeds counting, No/m^2)

Species of weeds	**Treatments**		
	Control	**Fresh chicken manure (6kg/ m^2)**	**Fresh chicken manure (12 kg/ m^2)**
Sinapsis arvensis (Wild mustard)	2.563	1.500	1.250
Convolvulus arvensis (Field bindweed)	0.938	1.813	0.588
Convolvulus galaticus Rostan ex Choisy	0.625	0.063	3.250
Sorghum halepense (Johnsongrass)	6.125	4.688	5.688
Taraxacum officinale (Common dandelion)	0.500	0.125	0.250
Cichorium intybus (Common chicory)	0.000	0.063	0.000
Galium tricornutum (Rough bedstraw)	4.125	3.500	5.625
Myagrum perfoliatum (Gold of pleasure)	3.938	3.250	3.438
Lactuca serriola (Prickly lettuce)	2.250	1.625	1.750
Carduus pycnocephalus (Italian thistle)	0.188	0.125	0.000
Coriandrum tordylium (Wild coriander)	0.750	0.688	0.000
Vicia sativa (Common vetch)	0.063	0.364	0.000
TOTAL	**22.085**	**17.804**	**21.839**
Species of weeds	**Solarized**	**Fresh chicken ma manure (6kg/ m^2) + Solarized**	**Fresh chicken Manure (12 kg/ m^2) + Solarized**
Sinapsis arvensis (Wild mustard)	0.000	0.000	0.000
Convolvulus arvensis (Field bindweed)	0.938	0.313	0.000
Convolvulus galaticus Rostan ex Choisy	1.188	0.813	1.000
Sorghum halepense (Johnsongrass)	0.000	0.000	0.000
Taraxacum officinale (Common dandelion)	0.000	0.000	0.000
Cichorium intybus (Common chicory)	0.000	0.000	0.000
Galium tricornutum (Rough bedstraw)	0.000	0.000	0.000
Myagrum perfoliatum (Gold of pleasure)	0.000	0.000	0.000
Lactuca serriola (Prickly lettuce)	0.063	0.125	0.000
Carduus pycnocephalus (Italian thistle)	0.000	0.000	0.000
Coriandrum tordylium (Wild coriander)	0.000	0.000	0.000
Vicia sativa (Common vetch)	7.752	3.626	0.313
TOTAL	**8.941**	**4.877**	**1.313**

Results we obtained adjust with similar studies carried out before (Lalitha *et.al*., 1985; Benlioğlu *et.al*., 2005; Cimen *et.al*., 2010 a).

In accordance with the control, sub-parcels on which fresh chicken manure had been applied, it is seen that the number of weed has decreased (Table 3b).

In second weed counting, taken combinations into consideration, the highest number of weed per unit area (number/m^2) came out at the control (22.085 number/m^2), and this was followed by the applications of "12 kg/m^2 fresh chicken manure" (21.839 number/m^2) and "6 kg/m^2 fresh chicken manure" (17.804 number/m^2). In addition to the fresh chicken manure application, weed density was considerably diminished by solarization (8.941 number/m^2) accelerates further by this application. Based on these combinations, the number fallen down to 4.877 by "6 kg/m^2 fresh chicken manure + solarization" and minimum weed number with the value of 1.313 number/ m^2 by the combination of "12 kg/m^2 fresh chicken manure + solarization" was acquired (Table 2c and Figure 3). On the other hand, weed density diminished at the rate of 60% by solarization application and reached at the rate of 94% by "12 kg/m^2 fresh chicken manure + solarization". On land conditions any other study formerly carried out about the effect of solarization in

combination with fresh chicken manure in different doses on weed density has not been encountered yet. Although, this is in accordance with the similar two studies carried out on greenhouse (Boz, 2009) and on open field conditions (Benlioglu *et.al*., 2005) which burned chicken manure is applied in combination with solarization in both studies in order to lift the effectiveness of solarization.

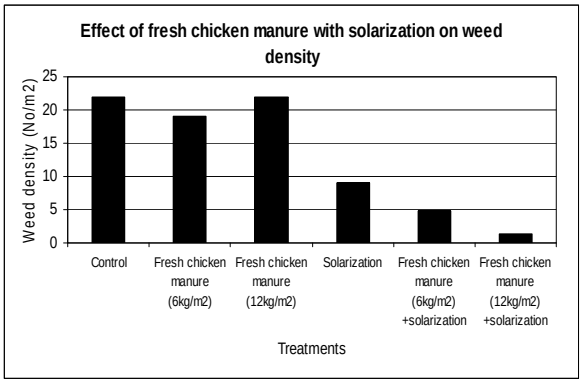

Fig 3. Effect of fresh chicken manure and solarization on combinations for total weed density (The second weeds counting)

Conclusion

Generally Turkish soils are lack of organic compounds. Organic compounds in soils are inadequate for Turkey. To a certain extent, this inadequateness is compensated with the addition of farm manure. Among these manures, the nutritional value of poultry manure is quite a lot compared to the others for plants. In horticultural cultivation, it is higly suggested to be used as burned since it's high in nitrogen and can easily burn plants unless composted first. Yet, when it is put into the soil in the period of not being cultivated and/or planted, burning stage can play a role to alleviate soil temperature. When it is applied with soil solarization, temperature becomes higher which can help to prevents weed germination.

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