Kirkuk University Journal for Agricultural Sciences
ISSN:2958-6585
https://kujas.uokirkuk.edu.iq

RESEARCH ARTICLE https://doi.org. 10.58928/ku25.16416

A survey of the diversity of harmful weeds and their vegetative density spread in some agricultural district within dry environment - Anbar Governorate

Abdulkarem A.M.alalwany [1] abed al_lateef mahmood ali alkaisy [1]
Fadhil Hussein Mukhli [1] Alaa Abdulghani Hussein [1]
Abdulmajed Ahmed Abd [1] Basim A.Zaidan [1]
Sami Awad Alkubaisyi [1]
[1]*Desert Studies Center , University of Anbar ,IRAQ.*
*Corresponding Author: ds.dr.abdalkareem@uoanbar.edu.iq.

Received:12/07/2025 Revised: 20/08/2025 Accepted: 17/09/2025 Published: 07/12/2025

ABSTRACT

The aim of this research is to study the characteristics of the vegetation cover of the bush and to identify the most common and widespread weeds associated with the fields of agricultural districts Due to the lack of environmental studies for the previously selected area, The study was conducted from April 2023 to the end of May 2024,The study found that the dominant weeds in agricultural fields were identified as 39 species out of 20 families in agricultural fields, 25 of which were annual plants (62.5%), 12 perennial plants (23.5%) and 2 biennial plants (5%). The dominant weed species in the counties included the following families: Poaceae, Compositae, Solanaceae. The number of weed plant species in the area was 9, 8 and 3, respectively, All plant species and their numbers that appeared in the square were recorded and the vegetation cover characteristics (density, frequency, abundance and coverage) were calculated for each plant species in the square. The results showed that the highest density was 7.06 plants m-2 Raphanus raphanistrum L. It was followed by Xanthium strumarium with 6.10 plants m-2, while the frequency ranged from 22 to 1.3 for Imperata cylindrica L. and Vaccaria pyramidata, respectively. The abundance ranged from 8.0 to 0.8 for Chenopodium album L. and Polygonum aviculare L., respectively. The highest coverage value was 5.20 for Chenopodium album L. and the lowest for Melilotus indicus L. with 0.05 plants m-2. The spread of these plants can pose a serious challenge to crop production if not adequately controlled. Each agricultural district should adopt appropriate weeding plans and strengthen weed control according to local conditions, especially the characteristics of the weed distribution area.

***Keywords*:** diversity ;agricultural district; Anbar Governorate; weeds; harmful.

INTRODUCTION

Statement of the status of the distributions of weed vegetation covers contributes to determining the effects of these changes on the economies of humans and the surrounding environment and interacting with them, such as the distribution of plant species and the productivity of agricultural crops in the region, and helps in identifying areas exposed to environmental risks and threats, and thus developing strategies for ecosystems and natural resources. Weed vegetation cover is one of the environmental components that affect human life and the surrounding environment, and understanding this effect and evaluating the weed vegetation cover contributes to making effective environmental decisions to develop strategies to maintain crop productivity and sustainability of nutrients present in the soil.

[1], considered weeds to be part of dynamic ecosystems, growing in a normal environment and causing economic losses in field crops. Weeds are unwanted plant species found growing in cultivated field crops, competing with economic plants, out of only 8000 weed species that are important to the world of agriculture [3].

This allows weed species to survive and grow in different ecological niches and as a result weeds have become dominant worldwide [2], [3] and are detrimental to local biodiversity [4] [5].
Weed plants have some distinctive characteristics, such as short seed dormancy, high seed germination rate, environmental adaptation, rapid seedling growth and reproductive capacity, short life cycle, self-compatibility, efficient and well-organized methods of seed depletion, production of various allelic chemicals and tolerance to biotic and abiotic stresses [1] [6]. Weeds cause significant loss of agricultural crops because they double the costs of various agricultural production operations, reduce the capacity of agricultural equipment and affect the fertility of soils and the permeability of nutrients, and reduce the ability of crop seeds to germinate due to phytotoxins or chemicals [7].
[8], studied the weed species composition and distribution pattern in maize crop under the influence of environmental factors and agricultural practices-Mardan, Pakistan, The study was conducted on the weed species composition and distribution pattern of weeds under the influence of environmental factor and agricultural practices in maize crop in Mardan district during August and September 2014. [7] studied the allopathic potential of medicinal plants and their role in developing bio-herbicides for environmentally friendly weed management strategies to maintain biodiversity and ecological balance and identify weed communities. The study area contained 29 diverse weed species belonging to 27 genera and 15 families distributed over 585 square meters. The use of synthetic herbicides in crop fields has increased crop production and productivity by reducing weed infestation, but over time it causes a number of environmental risks. The study recommended avoiding these harmful effects of synthetic herbicides. In crop fields, it has increased crop production and productivity by reducing weed infestation, but over time it causes a number of environmental risks. Therefore, to avoid these harmful effects of synthetic herbicides and the possibility of developing environmentally friendly herbicides from natural products to achieve sustainable agriculture. [9], studied the effect of soil properties on the diversity and distribution of weeds in citrus farms in the arid regions of northern Saudi Arabia. The chemical and physical properties of the soil and their effect on the distribution of weed species were studied. He concluded that the physical and chemical properties of the soil are strong explanatory variables for the distribution of weeds in agricultural ecosystems.
[10], studied the effect of spatial plant diversity variables as well as soil physical and chemical variables. He studied five sites in Tabuk region (KSA), namely Al-Disah, Al-Zaytah, Al-Awz, Al-Harrah, and Al-Sharma, to understand whether the soil variables with spatial structure (pH, electrical conductivity (EC), soil texture, calcium, potassium, phosphorus, phosphate, and total organic matter) affected 163 plant species belonging to 41 families and 124 genera from the five sites. Diversity indices including species richness were the highest value of beta diversity in Al-Disah (0.253) followed by Sharma (0.171), (OM), bicarbonate and sodium) affect plant diversity, in the first model, the first axis PCNM 1 showed a significant relationship with pH and potassium (adj–R2 = 0.175, $p = 0.046$). In the second model, PCNM 2 axis had a significant relationship with OM and sodium (adj–R2 = 0.561, $p < 0.001$). Finally, sodium was the only factor significantly associated with PCNM 3 axis (adj–R2 = 0.365, $p = 0.002$).) In conclusion, the variables with the spatial structure of the soil did not show a strong effect on plant diversity except for pH and potassium, which were associated with PCNM 1, OM and sodium, which were associated with PCNM 2, and sodium, which was associated with PCNM 3. The study area witnesses the presence of many plant species of jungles in terms of distributions, plant density and coverage. It is noted that these distributions may be due to mismanagement of these soils and the agricultural process, or resulting from climate change and human activity. The lands of the studied provinces are considered important agricultural areas in terms of the productivity of fruits and vegetables for the residents of those areas. The region is characterized by environmental diversity and an ecosystem. Therefore, the research problem is to evaluate the characteristics of jungle plants during the period from 2023-2024 and prepare control plans for decision-makers within the agricultural departments supervising agricultural operations in those areas.
The aim of conducting this survey is to identify the types of harmful weeds in these agricultural provinces, as well as to provide information that helps in making effective environmental and planning decisions in order to reduce the impact of the growth of weeds competing with economic crops in terms of depleting nutrients by using appropriate pesticides to combat them and reduce their negative impact on the growth and productivity of these crops and environmental sustainability.

2- Methodology

2-1-Study site

The study sites were selected based on the map of agricultural districts in Anbar Governorate issued by the General Directorate of Anbar Agriculture 2024-Iraq, The study area is located on the Arab side of Iraq

and extends astronomically between latitudes (33°20' and 33°27') north and longitudes (43°28' and 43°34') east. It is bordered to the north by Al-Jazeera region, to the east by (Al-Malahama) district, to the south by the Euphrates River and the city of Al-Khalidiyah, and to the west by (Mahouz) district. Figures 1 , and 2, Location of the study area Figure 3 Satellite image of the study areas. The area of is 27.20 km2 (10880 dunums).

Figure 1 :Location of the study area relative to Iraq.

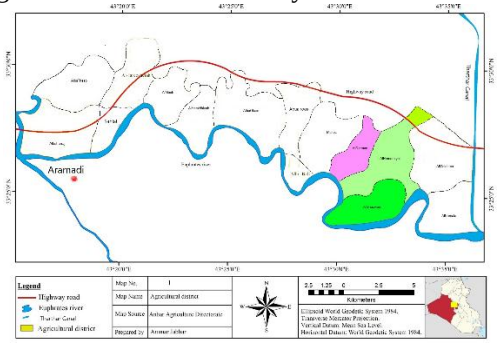

Figure 2 :Location map of the studied agricultural provinces (Source: [11])

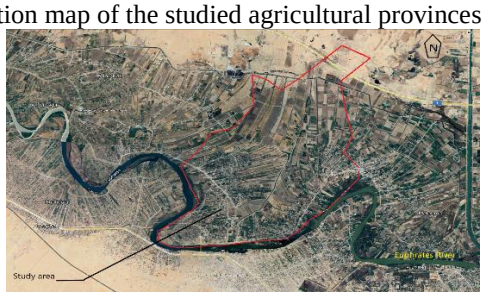

Figure 3 :Satellite image of the study areas [12]

2-2-Field work

The study relied on a scientific approach that is compatible with the nature of the study and used the inductive approach in field work by studying the various factors affecting the distributions of jungle plants and their nature, The descriptive method was also followed, The characteristics of the plant community were calculated based on[13] ,The types of vegetation found in the provinces included in the study were identified by taking plant samples and identifying their types using parts of [14]and [15], as references. As for the unidentified types, they were collected and dried and then identified later with the help of the herbarium. The ecosystem was analyzed by measuring some characteristics of the plant community using quantitative methods using the Random quadrat method with dimensions of (2×2 m), based on what was suggested by [13] [16], [17] , [18]:, as the repetition of the samples reached 30 squares .

Density= $\frac{Total\ number\ of\ individuals\ of\ a\ particular\ plant\ species}{Total\ number\ of\ study\ squares} \times 100$

Frequency=$\frac{The\ number\ of\ squares\ in\ which\ a\ particular\ type\ of\ plant\ appears.}{Total\ number\ of\ study\ squares} \times 100$

Abundance=$\frac{The\ total\ number\ of\ individuals\ of\ a\ particular\ plant\ species.}{Total\ number\ of\ individuals\ of\ all\ species} \times 100$

E- Coverage=

Crown cover = 1/4πD1D2

Figure 4 Map showing the locations of plant and soil samples, Figure 5. Field work in the study area.

.

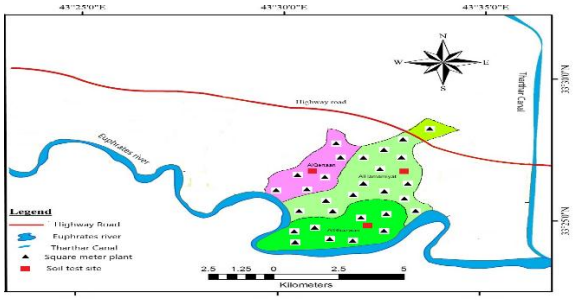

Figure 4: Map showing the locations of plant and soil samples for agricultural provinces

Figure 5 :Field work in the study area

2-3-Environmental characteristics of Study area

2-3-1- Climatic characteristics

The study of climatic conditions affecting the distribution of vegetation cover of jungles in the study area, and in order to measure the previous climatic elements, relied on data from the Khalidiya City Station. The astronomical location and height above sea level were determined as follows:

* A.S.L. m	Latitude	Longitude	Station name
157	20°33	34’°43	AlKhalidiya

A.S.L.: above sea level *

it was found that winter tends to be relatively cold, as the rate ranges from 24.4 °C and is characterized by a thermal range of 10.3 °C to 37.2 °C. As for summer, it is the hottest season, especially during the day, as its average and the thermal rate ranges from 30.2 °C to 37.2 °C, while the spring and autumn seasons are characterized by thermal fluctuations. On some days, temperatures rise clearly, but they soon decrease Monthly and annual rainfall rates vary in Al Khalidiya station, reaching an annual average of 10.3 mm, which contributes to the growth of annual plants. They derive their growth from moisture during irrigation of agricultural fields with irrigation water. However, in the summer, drought occurs in agricultural fields. Figure 5 represents the climate diagram of the study area. Table 1 provides data on the climatic elements of the studied area. Figure 6 represents the climate diagram of the study area, Figure 5 represents the climate diagram of the study area, Table 1 data on climatic elements for the studied area, Figure 6 represents the climate diagram of the study area.

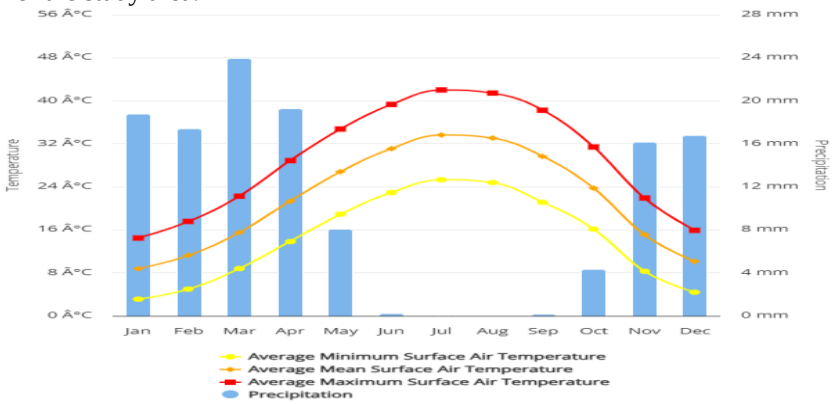

Figure 6: Represents the climate diagram of the study area for the years 1991-2020

Table 1 Climate elements data for the studied area

	January	February	March	April	May	June	July	August	September	October	November	December	Average
Avg.Temperature °C	10.3 °C	13 °C	18.4 °C	24.1 °C	30.2 °C	34.7 °C	37.1 °C	37.2 °C	32.9 °C	26.8 °C	17.3 °C	11.9 °C	24.4
Min.Temperature °C	6.2 °C	8 °C	12.3 °C	17.5 °C	23.3 °C	27.9 °C	30.4 °C	30.2 °C	26.2 °C	20.9 °C	12.6 °C	7.9 °C	18.6
Max.Temperature °C	15.1 °C	18.3 °C (	24.1 °C	30 °C	36.2 °C	40.9 °C	43.5 °C	43.6 °C	39.4 °C	32.8 °C	22.4 °C	16.5 °C	30.2
Precipitation / Rainfall mm	22	19	18	12	3	0	0	0	0	8	18	21	10.3
Humidity(%)	67%	56%	38%	31%	23%	18%	19%	20%	25%	34%	53%	65%	37.4
avg.Sun hours (h.)	8.1	9.3	10.5	11.6	12.5	12.9	12.7	12.0	11.2	10.2	8.8	7.9	10.6

2-4-Soil Sample Analysis

The study was conducted in 2023 and 2024 in three regions for representative soil samples, Were obtained from a depth of 0 - 50 cm and mixed as a mixed sample. Before sieving (with 2 mm sieve), the material samples were air dried:

- Soil mechanical analysis: by pipette and described by [19] cited in [20].
- Soil bulk density: The bulk density of the soil was estimated by the paraffin wax encapsulation method, according to the method given in [19].
- Electrical conductivity and soil reactivity: They were estimated in the saturated soil paste extract, using a Conductivity bridge and a pH meter, respectively, according to the methods given in [21].
- Soil content of calcium carbonate equivalent CaCO3: Estimated by titration with 1N sodium hydroxide after adding 1N hydrochloric acid and using phenolphthalein indicator as described in [22].
- Soil content of gypsum: Estimated by precipitation using acetone solution and then measuring the electrical conductivity of the precipitate formed according to the method of [20].
- Soil content of organic matter: Estimated by wet oxidation method and according to the method of Walkely and Black described in [22] by oxidizing it with potassium dichromate K2Cr2O7 and adding concentrated sulfuric acid as a heat source, then titrating with ferrous ammonium sulfate using the Ferrion indicator.

3- Results and discussion:

3-1- Description of Weed plants

The study of the jungles in the study areas showed that the percentage of perennial species was 32.5% compared to annuals, which amounted to 62.5%, while biennials amounted to 5%, which indicates the difference in environmental conditions of this region. The study of plant species and their percentages of the total showed that the most diverse plant species were in the family (Poaceae), which contained 9 plant species and a percentage of 22.5% of the studied jungle species, followed by the family (Compositae) with seven plant species and a percentage of 20.0% of the studied jungle species, while the family (Solanaceae) had three plant species and a percentage of 7.5%, while the rest of the families distributed their percentages among the studied jungle species.

Due to the harsh dry conditions that the study area suffers from, where the environment is desert and semi-desert, the vegetation cover of the jungle works to adapt in form, anatomical and functional manner according to this difficult condition, and the concepts related to the vegetation cover of harmful weeds varied. A table showing data on plant families, their genus, scientific and local names and life form. The descriptive analysis aims to display the data using Tables (2 , 3) and Figure (7) for the distributions of plant species to clarify the method of displaying the data obtained from the survey process conducted in the study areas, to clarify the display of the data and ease of reading and comparing them, Accordingly, Table (2) shows the data of the jungle plants in the Study area, as it includes the different plant species found in this plant environment as well as their special characteristics. We note from Table (3) that the high values of the plant density of the harmful jungle were within the family (Poaceae), where the highest value of the density was in the species (Cynodon dactylon L.) 5.40 m-2 plant, and the lowest value was within the same family in the species (Echinochlora colonum L.) 0.05 m-2 plant, and it was found that the plant (Imperata cylindrica L.) from the family (Imperata cylindrica L.) reached a frequency of 22%, while the lowest frequency was for the plant

(Vaccaria pyramidata) from the family (Caryophylaceae) reached 1.3%. As for the plant abundance of the bush, the plant (Xanthium strumarium) from the family (Asteraceae) represented the highest value in terms of its abundance compared to other plant species, as the percentage of plant abundance reached (8.9%) in the studied sites, followed by the plant (Chrozophora verbascifolia) which recorded a percentage of (7.4%), and came after it in terms of abundance, the plant (ardaria drapa) with an abundance of (6.7%), followed by the plant (Phragmites australis L) and its abundance reached (6.5%), and the least widespread plant was the plant (Lolium rigidum) from the family (Poaceae) with a value of (1%), Table 2 represents a scientific classification of plant species and Table 3 shows the characteristics of plant species of the bush in the study areas, Figure 7 shows pictures of the prevailing bush plants in the study area, Regarding the area of plant cover of the bush, the results in Table (3) showed that the highest value of cover was recorded for the species (Chenopodium album L) from the family (Chenopodiaceae) with a value of (5.20), which is a low value that confirms the poverty of the plant in the study area and the unsuitability of natural conditions and other factors, followed by the species (Cyperus rotundus L) with a value of (3.80), and the lowest values were for the species (Solanum elaeagnifolium) (0.03), Figure 8. Dominant weed plants in the study area.

Table2 Scientific classification of studied herbs

No.	Family	Genus	Scientific name	Local name	Life form	*No. cotyledon
1	Amaranthaceae	Chenopodium	*Chenopodium album L*	الرغيلة	Annual	++
			Beta vulgaris L	سليجة	Annual	++
		phragmites	*Phragmites australis L*	القصب البري	perennial	+
		Sorghum	*Sorghum halepense L*	السفرندة(ابوح ليان)	perennial	+
		Echinochloa	*Echinochlora colonum L.*	دهنان	Annual	+
		Cynodon	*Cynodon dactylon L*	الثيل	perennial	+
2	Poaceae	Imperata	*Imperata cylindrica L.*	حلفا	perennial	+
		Echinochloa	*Echinochlora colonum L.*	دنان	Annual	+
		Avena	*Avena fatua*	شوفان بري(دنوسر)	Annual	+
		Lolium	*Lolium rigidum*	حنيطة	Annual	+
		Hordeum	*Hordeum murinum*	شعير (ابو شوارب)	Annual	+
3	Cyperace	Cyperus	*Cyperus rotaundus L.*	السعد	perenni	+
4	Amarant	Amaranthus	*Amaranthus retroflexus L*	عرف الديك	Annual	++
5	Compositae	Lactuca	*Lactuca scariola L*	الخس البري	Annual	++
		Carthamus	*Carthamus oxyacanthus L.*	الكسوب	Annual	+
		Sonchus	*Sonchus oleraceus L.*	أم الحليب	Annual	++
		Silybum	*Silybum marianum.*	كلغان	Annual	+
		Tripolium	*Aster tripolium*	استر	perennial	++
		Symphyotrichum	*Aster subulatus*	استر	biennial	++
6	Polygonaceae	Carduus	*Carduus pycnocephalus*	لسان الكلب	Annual	++
		Rumex	*Rumex dentatus*	حميض	Annual	++
		Polygonum	*Polygonum aviculare L.*	مصاله	Annual	++
7	Leguminosae	Melilotus	*Melilotus indicus L.*	حندقوق	Annual	++
8	cruciferae	Raphanus	*Raphanus raphanistrum L.*	فجيلة	Annual	++
		Lepidium	*cardaria drapa*	جنبيره	biennial	++

9	Umbellifereae	Ammi	*Ammi majus*	زندالعروس	Annual	++
10	Plautaginaceae	Plantago	*Plantago lanceolate*	زباد	Annual	++
11	Cuscutaceae	Cuscuta	*Cuscuta compestris L.*	الحامول	perennial	++
		Solanum	*Solanum nigrum L.*	عنيب الذيب	perennial	++
12	Solanaceae	Solanum	*Solanum elaeagnifolium*	عشبة الباذنجان	Annual	++
		Datura	*Datura stramonium*	داتوره	perennial	++
13	Euphorbiaceae	*Chrozphora*	*Chrozophora verbascifolia*	الزريج	Annual	++
14	*Convolvulaceae*	Convolvulus	*Convolvulus arivesis L .*	البردي	perennial	+
15	Gramineae	Dichanthium	*Dichanthium annulatum*	زمزوم	perennial	+
16	pontindriceae	Pontederia	*Eichhorinia Crasspes*	عشبة النيل	perennial	+
17	Copparidaceae	Capparis	*Copparis spinose*	كبر (شفلح)	perennial	++
18	Caryophylaceae	Gypsophila	*Vaccaria pyramidata*	خرز بنت الفلاح	Annual	++
19	Orobanchaceae	Orobanche	*Orobanche aegyptiaca*	هالوك	Annual	++
20	Asterace	Xanthium	*Xanthium strumarium*	اللزيج(حسك)	Annual	+

* Monocotyledon:+ ; Dicotyledon: ++

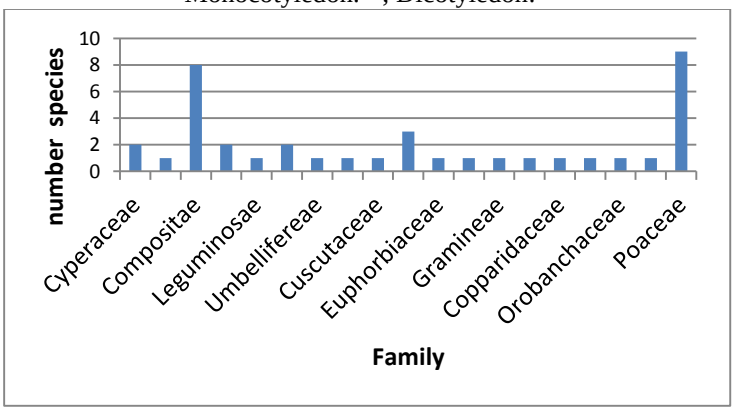

Figure 7:Relative number of family types recorded in the studied sites of agricultural districts

Table 3 Characteristics of plant species of weed in study areas

Type	density plants .m^{-2}	Crown Cover m^2	Frequency %	Abundance %
Chenopodium album L	0.06	5.20	20	8
Beta vulgaris L	1.17	0.84	11	7
Phragmites australis L	1.68	1.05	8	6.5
Sorghum halepense L	0.43	2.80	9	4
Echinochlora colonum L.	0.05	0.40	13	2
Cynodon dactylon L	5.40	0.54	16	4.7
Imperata cylindrica L.	0.16	0.05	22	3
Echinochlora colonum L.	1.07	1.80	19	3.2
Avena fatua	1.48	0.40	20	2

Lolium rigidum	0.53	0.54	7	1
Hordeum murinum	0.15	1.15	6	1.5
Cyperus rotaundus L.	2.20	3.80	4	5
Amaranthus retroflexus L	1.06	2.40	8	2.1
Lactuca scariola L	0.15	0.54	11	2.4
Carthamus oxyacanthus L.	2.08	1.15	10	1.4
Sonchus oleraceus L.	0.13	1.80	12	2.1
Silybum marianum	1.06	0.40	15	2.0
Xanthium strumarium	6.10	1.20	6.4	8.9
Aster tripolium	1.17	0.04	12	2.2
Aster subulatus	1.17	1.03	21	3.1
Carduus pycnocephalus	1.58	0.80	11	2.1
Rumex dentatus	0.43	0.30	16	0.9
Polygonum aviculare L.	1.18	0.44	14	0.8
Melilotus indicus L.	4.20	0.05	6	1.0
Raphanus raphanistrum L .	7.06	1.06	19	1.4
ardaria drapa	2.17	0.40	15	6.7
Ammi majus	1.08	0.04	4	1.8
Plantago lanceolate	0.33	1.05	3	3.2
Cuscuta compestris L.	0.95	2.80	6	2.4
Solanum nigrum L.	5.00	0.14	12	2.1
Solanum elaeagnifollium	1.16	0.03	11	2.3
Datura stramonium	1.87	2.80	12	1.0
Chrozphora verbascifolia	2.40	1.30	13	7.4
Convolvulus arivesis L .	0.54	0.40	5	2.6
Dichanthium annulatum	1.15	0.05	2	1.8
Eichhorinia Crasspes	0.70	0.41	17	2
Copparis spinose	1.54	0.14	3	1.5
Vaccaria pyramidata	0.15	1.15	2	1.4
Orobanche aegyptiaca	2.80	2.00	12	4.5

3-2- Condition of soils

The characteristics of the soils in the study area affect the growth and distribution of the jungle plants. From observing the table of these characteristics, the table shows that all the plants were within the acid function that tends towards light basicity, The high salinity of the soil affected the growth and distribution of these jungles and the concentration of dissolved solids, The degree of soil salinity affects the suitability of these soils for the growth of weeds. We find that the salinity of the studied soils was within the very high ranges, This possible difference may be due to differences in the contents of the soil and its texture. Table 4 Chemical and physical characteristics of the soils of the study areas, The result of the physical and chemical properties of the soil in the studied provinces is as shown in Table 1.

The particle size distribution showed that most of the sampling points fall within the texture class (silty clay-clay texture), The alluvial nature of the districts can be attributed to the result of the sorting of materials by flooding and the deposition of silt and alluvium within the floodplain of the Euphrates River, this can be related to the high clay content observed in each site, The average pH of the three sites was observed to be 7.5 (Table 4) and was classified as slightly basic. Organic matter is an important component of soil and plant growth that acts as a storehouse of plant nutrients, and was observed to be low with an average of 1.53%, the low organic matter content can be attributed to the poor land cover in the study areas, however, [24] found that soil pH and texture are the most important factors in structuring weed communities in the temperate zone (France), On the other hand, some studies have highlighted that agricultural practices are the main drivers of weed diversity and abundance in agroecosystems [25]. Soil productivity declines when vegetation cover is lost and proper management practices are not adopted which can lead to depletion of organic matter and reduced agricultural productivity, This can be linked to the complete removal of crop residues along with the post-harvest product in the studied counties, this leads to a significant loss of organic matter.

Table 4 Chemical and physical properties of soils in the study areas

Name province	Soil Texture	Bulk Density Megm^{-}	pH	ECe dSm^{-1}	Gypsum %	$CaCO_3$ %	OM %
Ghazwane	SiCL	1.24	7.7	61.9	3.6	20.9	1.2
Hamameat	SiL	1.27	7.4	79.4	3.9	18.1	2.0
Kartan	CL	1.25	7.6	70.3	3.9	20.9	1.4

Figure 8: Dominant weed plants in the study area.

Conclusions

The study concluded that the studied area includes a remarkable diversity of harmful weed plants and the variation in the composition of species within the site or diversity between them was high, and spatial variables showed a clear effect on plant diversity, and the spatial soil variables of acidity, salinity, organic matter, and calcium carbonate and sulfate content, with a strong possibility of increasing the density of plant communities if the plant diversity of harmful weeds in the currently studied sites does not face any activities to combat them and reduce the damage from their spread, which led to a significant increase in natural biodiversity, the results of the study gave a clear idea of the characteristics of the plant species of the weeds and the possibility of those in charge of managing those soils to prepare plans to combat them from knowing the plant species and choosing the appropriate types of pesticides suitable and effective for those weeds and activating the role of agricultural extension by conducting training courses for farmers on the use of pesticides resistant to agricultural pests. Programs should be designed and a plan prepared for combating and good executive management immediately to protect economic agricultural crops and maintain the sustainability of the province's soils from depletion and deficiency of minerals and nutrients due to Spread of weeds.

Recommendation

Based on the results of this study, we recommend the following:

1. Regular monitoring by agricultural officials of spread and density of weeds, given their impact on agricultural production in these areas.
2. Establishing stations within these agricultural areas to study weed plant characteristics and determine the appropriate pesticide to combat each species.
3. Conducting educational courses for farmers to inform them of the harmful effects of weeds and conducting further research on phenomenon of weed distribution to develop appropriate and effective plans to address it in the future.

Acknowledgments

The research team thanks the administration of Anbar University and the Desert Studies Center for preparing the practical requirements for field activities for the study.

References

[1]. Baker, H.G., (1974) The evolution of weeds. Annu. Rev. Ecol. Syst., 1–24. The Evolution of Weeds | Annual Reviews.
[2]. Holm, L., Pancho, J.V., Herberger, J.P., Plucknett, D.L., (1979) A Geographical Atlas of World Weeds. John Wiley and Sons.
[3]. Holm, L. 1997. World Weeds: Natural Histories and Distribution. John Wiley & Sons.
[4]. Duke, J.A. (1983) Handbook of Energy Crops. Unpublished. http://www.rain-tree.com/papaya.htm.
[5]. Tilman, D. (2000) Causes, consequences and ethics of biodiversity. Nature 405, 208–211.
[6]. El-Sheikh, M.A. (2013) Weed vegetation ecology of arable land in Salalah, Southern Oman. Saudi J. Biol. Sci. 20, 291–304.
[7]. Algandaby, M.M., Salama, M. (2016)Management of the noxious weed; *Medicago polymorpha* L. via allelopathy of some medicinal plants from Taif region, Saudi Arabia. Saudi J. Biol. Sci. Accepted, http://ac.els-cdn.com/S1319562X16000607/1-s2.0-S1319562X16000607-main.pdf.
[8]. Ahmad Z. , Shujaul M. K. , Elsayed F. A.A. , Abdulaziz A. A. , Abeer H. (2016) Weed species composition and distribution pattern in the maize crop under the influence of edaphic factors and farming practices: A case study from Mardan, Pakistan. //doi.org/10.1016/j.sjbs.2016.07.001.
[9]. AL-QAHTANI, S. M. (2019)EFFECT OF SOIL PROPERTIES ON THE DIVERSITY AND DISTRIBUTION OF WEEDS IN CITRUS FARMS IN ARID REGION . Applied Ecology and Environmental Research.
[10]. Al-Mutairi, K.A. (2022)Do Spatially Structured Soil Variables Influence the Plant Diversity in Tabuk Arid Region, Saudi Arabia? Sustainability, 14, 2611. https://doi.org/10.3390/su14052611.
[11]. Sabti, A. J. (2021) Spatial and Temporal Variations in Land Capability and Land Use for Some Agricultural Districts from Ramadi City Using GIS. degree of Master of Science in Agriculture. college of Agriculture - University of Anbar.
[12]. Electronic References:https://support.google.com/earth/answer/148115?hl=en, ( )2024.
[13]. Cain , S. A. and G. M. Castro (1959) Manual of vegetation analysis. Harper, New York.
[14]. Guest , E., Townsend C.C. (1974) FLORA OF IRAQ . Ministry of Agriculture & Agrarian Reform Republic of Iraq.
[15]. Guest , E. (1968) Flora of Iraq Volume: 9. Publisher: Bentham-Moxon Trust.
[16]. [16]Mueller, D.D., Ellenbery H. (1974) Aims and Methods of Vegetation Ecology . John Wiley and Sons, New York and London . pp: 547 .
[17]. Barbour , M.G., J.. Burk , and W.D. pitts (1980) Terrestrial plant ecology. The Benjamin cummings publ. company . Inc.USA.
[18]. Thalen, D.C .P. (1979) Ecology and Utilization of Desert shrub- rangelands In Iraq. Ph.D. thesis. Netherlands.
[19]. Abusmour, Hassan (2005) Biogeography and Soil, Dar Al-Masirah for Publishing and Distribution, Amman, Jordan.
[20]. Kilmer, V. J., Alexander, L. T. (1949) Methods of making mechanical analyses of soils. Soil Science, 68-1-, 15-24.
[21]. Allison, L. E., & Richards, L. A. (1954) Diagnosis and improvement of saline and alkali soils (No. 60). Soil and Water Conservative Research Branch, Agricultural Research Service, US Department of Agriculture.
[22]. Page, A. L., Miller, R. H., & Keeney, D. R. (1982) Methods of soil analysis. Part 2: Chemical and microbiological properties. Amer. Soc. Agron. Soil Sci. Soc. Amer. In, Madison, Wisconsin, USA.
[23]. Jackson, M. L. (1958) Soil chemical analysis prentice Hall. Inc., Englewood Cliffs, NJ, 498, 183-204.
[24]. Fried, G., Norton, L. R., Reboud, X. (2008) Environmental and management factors determining weed species composition and diversity in France. – Agriculture, Ecosystems & Environment 128: 68-76.
[25]. Rauber, R. B., Demaría, M. R., Jobbágy, E. G., Arroyo, D. N., Poggio, S. L. (2018)Weed communities in semiarid rainfed croplands of Central Argentina: comparison between corn (*Zea mays*) and soybean (*Glycine max*) crops. – Weed Science 66: 368-378.

مسح تنوع الاعشاب الضارة وكثافتها الخضرية المنتشرة في بعض المناطق الزراعية ضمن البيئة الجافة ـ محافظة الانبار

عبد الكريم احمد العلواني[1] عبد اللطيف محمود علي القيسي[1] فاضل حسين مخلف[1]
علاء عبد الغني حسين [1] عبد المجيد أحمد عبد [1] باسم عبد زيدان [1] سامي عوض الكبيسي[1]
مركز دراسات الصحراء, جامعة الانبار , العراق.

الخلاصة

يهدف هذا البحث إلى دراسة صفات الغطاء النباتي للأدغال وتحديد أكثر الأعشاب الضارة شيوعًا وانتشارًا المرتبطة بحقول المناطق الزراعية نظرًا لعدم وجود دراسات بيئية للمنطقة المختارة سابقًا، أجريت الدراسة من أبريل 2023 إلى نهاية مايو 2024، وتوصلت الدراسة إلى أن الأعشاب السائدة في الحقول الزراعية تم تحديدها بواقع 39 نوعًا من أصل 20 عائلة في الحقول الزراعية، منها 25 نوعًا من النباتات الحولية (62.5٪) و12 نوعًا من النباتات المعمرة (23.5٪) و2 من النباتات ثنائية الحول (5٪). وشملت أنواع الأعشاب السائدة في المقاطعات العائلات التالية: النجيلية والمركبة والباذنجانية. بلغ عدد أنواع نباتات الأعشاب في المنطقة 9 و8 و3 على التوالي، وتم تسجيل جميع أنواع النباتات وأعدادها التي ظهرت في المربع وتم حساب خصائص الغطاء النباتي (الكثافة والتكرار والوفرة والتغطية) لكل نوع نباتي في المربع. أظهرت النتائج أن أعلى كثافة كانت 7.06 نباتًا م-2 لنبات (*Raphanus raphanistrum L*)، يليه نبات (*Xanthium strumarium*) بكثافة 6.10 نباتًا م-2، بينما تراوحت التكرارات بين 22 و1.3 لنباتي (*Imperata cylindrica L*) و (*Vaccaria pyramidata*) على التوالي. تراوحت الوفرة بين 8 و0.8 لنباتي (*Chenopodium album L*.) و (*Polygonum aviculare L*.) على التوالي. بلغت أعلى قيمة تغطية 5.20 لنبات (*Chenopodium album L*) وأقلها لنبات (*Melilotus indicus L*) بكثافة 0.05 نبات م-2. يمكن أن يشكل انتشار هذه النباتات تحديًا خطيرًا لإنتاج المحاصيل إذا لم تتم السيطرة عليها بشكل كافٍ. ينبغي على كل منطقة زراعية اعتماد خطط مناسبة لإزالة الأعشاب الضارة وتعزيز مكافحة الأعشاب الضارة وفقًا للظروف المحلية، وخاصة خصائص منطقة انتشارها.

الكلمات المفتاحية: التنوع؛ المقاطعة الزراعية؛ محافظة الأنبار ؛ الادغال الضارة.