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Impact of foliar spray with some micronutrients on damsisa (ambrosia maritima l.) Plants

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Abstract

The current work was completed in the Test Region. Faculty of Agriculture, Fayoum, Cairo University in two progressive periods of 1999/2000 and 2000/2001.This examination planned to contemplate the impact of some rnicronutrients on the growth, sesquiterpene lactones and some chemical components of damsisa plants. The plants were grown in clay soil and splashed with micronutrients chelated-structure either (Fe, Mn or Zn) at the paces of 0, 0.5, 1.0, 1.5 and 20%.Obvious impacts of different tretments were seen on every one of the contemplated boundaries during the two developing seasons. All treatments essentially expanded plant height, number of branches, stem diameter, fresh and dry weight of herb and delayed flowering date. Likewise, increased chlorophyll a. b. total and carotenoids in the leaves, total and non-soluble carbohydrate content of herb, crude protein, conjugated phenols, total indols, N, P, K, Fe, Mn and Zn percentages and sesquiterpene lactones of herb. While, decreased total free amino acids, free phenols, total and reducing sugars. As a rule, the expansion in development and compound part under certain micronutrients splash was related with a considerable expansion in leaf sesquiterpene lactones concentration.

Keywords: damsisa**;** Fe; Mn; Zn**;** chemical components

Introduction

Ambrosia maritime L. plant is broadly utilized in in Sudanese conventional remedy for the remedy of urinary tract infections, gastrointestinal disturbance, kidney stones, diabetes, hypertension, asthma, rheumatic pain, and cancer (Dirar et al., 2014).

Iron (Fe), manganese (Mn) and zinc (Zn) are micronutrients which might be crucial in small portions to microorganisms, plant life and animal organisms, including humans. Through their involvement in numerous enzymes and different physiologically lively molecules, they play essential roles withinside the organic tactics of organisms.They are required in very small portions for ordinary increase and improvement and development of the plant life. Deficiency of any of those micronutrients hampers ordinary plant increase and plant may also show off deficiency signs ensuing in discount in yield and excellent of crops. On the opposite hand, presence of those factors in poisonous concentrations might also adversely have an effect on the increase of plant life. Therefore, it's far crucial to preserve soil micronutrients at suitable levels, now no longer simplest for gratifying plant desires however additionally for preventing any capability build-up for you to maintain agricultural manufacturing and preserve environmental excellent (Shahid et al.,2016).

Nutrition for plant life especially micronutrients had a critical position in enhance the vegetative boom, flowering and chemical ingredients of many plant life. This truth become pronounced by many investigators along with Mohamed et al.(2001) on roselle, Agamy et al. (2004) on marigold, , Seif El-Yazal (2007) on maize, Seif El-Yazal (2008) on tuberose, Fahad et al.(2014) on gladiolus, Kumar et al.(2018) on Marigold, Ruati et al.(2019) on chrysanthemum, Shyala et al.(2019)on marigold ,Seif El-Yazal (2019) on maize and Paramesh et al.(2020)on wheat pronounced that spraying plant life with Fe, Mn and Zn extended each vegetative and flower parameters in addition to plant ingredients.

The aim of this study was to search the impact of a few micronutrients namely, iron, manganese and zinc sprays on vegetative growth and flowering in addition to chemical additives of damsisa plant. Which motivated the biosynthesis and accumulation of the

principal active ingredients, sesquiterpene lactones.

Materials and Methods:

A pot experiment was conducted all through successive seasons (1999/2000 and 2000/2001) within side the Experimental Farm of Faculty Agric. Fayoum Cairo Univ., to have a look the impact of foliar spray with iron, manganese and zinc on boom and chemical contents of damsisa plants (Ambrosia maritime L.).

Seeds of damsisa had been sown in organized seed beds on September 10 th for each studied season. Uniform seedlings 10-15cm length had been transplanted after 50 days in 30 cm diameter pots full of clay soil. The chemical evaluation of the soil is determined the use of the approach of Chapman and Pratt (1978). The records had been found in Table (1).

pH	EC Mmhos/cm	Soluble cations meq/1					Soluble anions meq/1					Micro-elements ppm
		Ca^{++}	Mg^{++}	Na^{+}	K^{+}	CO_3^{-}	HCO_3^{-}	CL^{-}	So_4^{-}	Fe	Mn	Zn
7.81	6.9	1.38	1.41	4.43	1.68	--	3.15	2.45	4.91	2.8	1.9	2.1

Table 1: Chemical analysis of the used soil

Micro-nutrients Fe-EDTA(13.2%Fc), Mn-EDTA(13%Mn) and Zn-EDTA(14^{0}/o Zn) was foliar application on plants twice; the first was applied after one month from transplanting and the second spray was after one month later at the rates of or 2.0%. Each plant received 250 ml of the assigned solution.

The experiment comprised 13 treatments, each treatment included four replicates, each replicate contained one pot (one plant/plot). The pots were distributed in complete randomized block design.

In both seasons, the plants were grown to flowering stage and at 50% of flowering (172 days from transplanting), plants within each treatment were cut. After cutting, the following data were recorded:

Plant height (cm), number of branches/plant, stem diameter (cm), fresh weight of plant (g), dry weight of plant (g) and flowering time (days), the number of days from planting to the beginning of flowering (25 percent of the total flower) in each treatment were recorded after (167) days from planting.

Chemical constituents:

For each treatment two samples were collected in the morning after (126 days) and (172 days) after transplanting. The contents of chlorophyll and caroteniods were determined in fresh leaves samples (mg/g) according to Welburn and Lichtenthaler (1984). Total carbohydrates (mg/g F.W.) were determined colorimetric according to the method described by Dubois et al. (1956). Total and reducing sugars (mg/g F.W.) were determined according to A.O.A.C. (1995). Non-reducing sugars were obtained by subtracting reducing sugars from total sugars as mg/g fresh weight. Non-soluble carbohydrates were obtained by subtracting total sugars from total carbohydrates as mg/g fresh weight. Total free amino acids (mg/g F.W.) were determined according to Jayarman (1981). Free phenols (mg/gF.W.) were determined according to A.O.A.C.(l995). Total phenols (mg/g F.W.) were determined according to Snell and Snell (1953) and thus conjugated phenol were obtained by subtracting free phenols from total phenols. Total indols (mg/g F.W.) were determined according to Larson et al. (1962)

Total nitrogen % was determined in powdered dry herb according to the method described by A.O.A.C. (1995) and was multiplied by 6.25 to calculate protein (%). Phosphorus % was determined according to method described by A.O.A.C. (1995). Potassium% was determined by Flame-Photometer ParkinElemer model 52 with acetylene burner according to Page et al. (1982), Mn, Fe and Zn were determined in dry herb by using Flame-ionization atomic absorption, spectrometer Model 1100 B of Parkin Elemer and according to the method of Chapman and Paratt (1978). Total sesquiterpene lactones concentration (mg/g.) were determined calorimetrically in dry herb according to the method described by El-Sawy et al.(1987), the method depends on measuring the color produced by the effect of Baljet's reagent on the sesquiterpene lactones (armbrosin and damsin), which gave orange color, the resulting orange color is measured calorimetrically (Sepectronic Bauch and Lamb) at 495 nm. The values presented in the results obtained in this investigation is the mean of the two seasons under the study

The obtained data were statistically analyzed and comparison among means of different treatments were performed using the Least Significant Differences procedure (LSD) at P=0.05 level as illustrated -by Snedecor and Cochran (1980).

Results:

Growth characters:

Plant height:

The consequences acquired in Table (2) display that each one used remedies of micronutrients elevated damsisa plant height withinside the seasons. The maximum will increase in plant height had been acquired from the remedies of Iron, manganese or zinc at 2.0% within side the seasons. The percent of increase reached about 33.67, 30.09 and 42.85 % for Fe, Mn or Zn, respectively, over the control.

Number of branches/plants:

Data in Table (2) imply that each one remedies of micronutrients elevated quantity of branches/plant within side the seasons as in comparison with control. The maximum quantity of branches according to plant was acquired through the utility of iron, manganese and zinc at the very best rate 2.0% within side the seasons in comparison to different remedies. The percent of increase reached 31.13, 10.68 and 15.31 % for Fe, Mn and Zn, respectively, over the control.

Stem diameter:

The effects in Table (2) generally display that each one

micronutrient extended stem diameter. Fe, Mn or Zn at 2.0% were the only remedies in growing stem diameter withinside the seasons. The percentage of increase reached 7.56, 15.96 and l6.80 % for Fe, Mn or Zn, respectively, over the control.

Table1. Physical and chemical plats of the used soil before sowing in both seasons.

Treatments		plant height (cm.)				No. of branches				Stem diameter (cm)
		2000	2001	Men	2000	2001	Men	2000	2001	Men
Control		31.00	34.33	32.67	38.67	33.00	358.4	1.17	1.20	1.19
Fe	0. 5%	35.67	40.00	37.84	43.33	36.00	39.67	1.19	1.30	1.25
	1.0%	36.67	44.67	40.67	41.00	34.67	37.84	1.20	1.30	1.25
	1.5%	39.00	41.00	40.00	39.00	34.67	36.84	1.27	1.25	1.26
	2.0%	41.00	45.00	43.67	47.67	46.33	47.00	1.27	1.29	1.28
Mn	0. 5%	34.67	38.67	36.67	39.67	33.00	36.34	1.19	1.19	1.19
	1.0%	36.00	45.67	40.34	41.00	34.00	37.50	1.30	1.27	1.29
	1.5%	39.00	45.67	42.34	41.00	35.00	38.00	1.20	1.30	1.25
	2.0%	40.33	44.67	42.50	45.00	34.33	39.67	1.30	1.47	1.38
Zn	0. 5%	32.33	39.67	36.00	38.70	34.00	36.35	1.30	1.27	1.29
	1.0%	31.67	38.67	35.17	38.90	34.90	36.90	1.17	1.27	1.22
	1.5%	35.67	40.67	38.17	40.33	35.67	38.00	1.19	1.20	1.20
	2.0%	44.33	49.00	46.67	44.33	38.33	41.33	1.40	1.37	1.39
L.S.D$_{0.05}$%		4.93	5.99	5.46	2.46	2.48	2.47	0.16	0.22	0.19

Table 2: Effect of spray treatments with some micronutrients on some growth character of damsisa plants (Ambrosia maritime L.).

Herb fresh and dry weight/plant:

The records received in Table (3) without a doubt display that each herb fresh and dry weight had been expanded as a result of treating plants with micronutrients as foliar spray. The maximum effective remedies on this appreciate had been (Fe and Mn at 1,0, 1.5 and 2.0%) compared with the control. Whereas Zn had insignificant rise in plant fresh and dry weight compared to control.

Flowering date (days):

The effects received in Table (3) display that everyone micronutrient remedies appreciably retarded flowering as in comparison with the control. This retarding impact on flowering date might also additionally be attributed to the boom in vegetative growth.

Treatments		Fresh weight/ herb (g)				Dry weight/ herb (g)				Flowering time(days))
		2000	2001	Men	2000	2001	Men	2000	2001	Men
Control		96.00	78.3	87.2	47.51	34.60	41.06	153.0	171.7	162.3
Fe	0.5%	106.9	89.7	98.0	48.19	38.83	43.51	160.0	180.7	170.3
	1.0%	112.0	102.7	107.3	51.49	48.01	49.75	158.0	178.3	167.2
	1.5%	124.0	116.7	120.3	51.18	50.56	50.87	159.0	178.3	168.7
	2.0%	138.0	128.7	133.4	26.62	53.08	57.85	159.0	179.3	169.2
Mn	0.5%	98.0	80.7	89.3	48.36	36.99	42.68	154.0	172.3	163.2
	1.0%	113.7	121.0	117.3	51.88	52.42	52.15	154.0	174.7	164.3
	1.5%	126.0	99.7	112.8	55.89	45.19	50.54	154.0	173.0	163.5
	2.0%	135.7	126.7	131.2	59.65	53.09	56.37	157.0	177.0	167.0
Zn	0.	96.7	79	88	39	35	37	15	17	165.2

	5%		.7	.2	.06	.51	.09	5.0	5.3	
	1.0%	96.9	86.7	91.8	41.37	37.50	39.44	156.0	176.3	166.2
	1.5%	97.0	86.7	91.8	43.08	37.16	40.12	155.0	175.0	165.0
	2.0%	108.7	97.0	102.8	49.53	44.37	46.95	160.0	182.0	171.0
L.S.D$_{0.05}$%		16.21	13.62	14.92	7.96	6.17	7.06	NS	0.72	0.36

Table 3: Effect of spray treatments with some micronutrients on some growth character and flowering date of damsisa plants (Ambrosia maritime L.).

Chemical composition of leaves:
Pigments concentration:

Data in Table (4) display that leaf plastid pigments concentration (chlorophyll a, b, total and carotenoids) of damsisa phant leaves collected in the second sample was greater than that in the first one. In addition, leaf plastid pigments concentration had been increased commonly due to treating flora with the used micronutrients.

The only remedies for increasing (chlorophyll a .b, total and carotenoids) had been Fe, Mn or Zn at 2.0%. The percent of boom reached 12.54, 9.83 and 9.49 % for Fe. Mn or Zn. respectively, over the control for chlorophyll a, 119.67 ,64.75 and 64.75 % for chlorophyll b. 43.88 .25.89 and 2565 % for total chlorophyll, and 11.76, 17.64 and 17.64% for carotenoids.

Treatments		Chlorophyll A mg/g F.W.		Chlorophyll B mg/g F.W.		Total chlorophyll mg/g F.W.			Carotenoids mg/g F.W.
		2000	2001	2000	2001	2000	2001	2000	2001
Control		1.28	2.95	0.73	1.22	2.01	4.17	0.24	0.34
Fe	0. 5%	1.39	3.41	0.83	1.96	2.22	5.37	0.36	0.38
	1.0%	1.92	3.17	1.60	1.96	3.52	5.13	0.26	0.35
	1.5%	1.96	3.07	1.15	1.63	3.11	4.70	0.26	0.34
	2.0%	2.01	3.32	1.69	2.68	3.70	6.00	0.45	0.34
Mn	0. 5%	1.98	2.95	1.20	1.25	3.18	4.20	0.36	0.36
	1.0%	1.34	3.09	0.76	1.43	2.10	4.52	0.28	0.40
	1.5%	1.29	2.95	0.74	1.22	2.03	4.17	0.30	0.36
	2.0%	1.87	3.24	1.13	2.01	3.00	5.25	0.38	0.38
Zn	0. 5%	1.61	2.97	1.01	1.22	2.62	4.19	0.34	0.38
	1.0%	1.52	3.21	1.09	1.90	2.61	5.11	0.33	0.40
	1.5%	1.61	3.14	1.01	1.89	2.62	5.03	0.35	0.37
	2.0%	1.90	3.23	1.12	2.01	3.02	5.24	0.38	0.39
L.S.D$_{0.05}$%		0.04	0.06	0.04	0.04	0.03	0.07	0.01	0.02

Table 4: Effect of spray treatments with some micronutrients on chemical constituents of damsisa plants (Ambrosia maritime L.).

Carbohydrates:

Data in Tables (5&6) display that total and non-soluble carbohydrates attention within side the plant leaves accrued within side the second sample changed into more than that within side the first one. On the different hand, the statistics display a marked lower in total, reducing and non- reducing sugars attention within side the plant leaves accrued in time second sample than that within side the first one. In addition, the received statistics additionally display that total and non-soluble carbohydrates had been expanded in damsisa plant leaves with, all treatments. Whereas the statistics additionally proven a marked lower in total and reducing sugars for leaves of the treated plants at different rates. The received consequences indicated that there is no exact fashion on non- reducing sugars content of leaves as suffering from the numerous remedies used.

Treatments		Total carbohydrates mg/g F.W.		Non-soluble carbohydrates mg/g F.W.		Total sugars mg/g F.W.			Reducing sugars mg/g F.W.
		2000	2001	2000	2001	2000	2001	2000	2001
Control		56.66	70.65	43.47	61.66	13.19	8.99	8.16	4.31
Fe	0. 5%	59.98	76.26	46.91	69.41	12.67	6.85	5.78	1.76
	1.0%	61.14	76.27	50.88	71.77	10.26	4.50	5.08	1.94
	1.5%	59.58	94.53	46.45	88.71	13.13	5.82	4.09	1.90
	2.0%	87.37	101.77	78.94	98.10	8.43	3.67	4.14	3.13
Mn	0. 5%	58.75	81.43	46.64	72.89	11.91	8.54	4.42	2.94
	1.0%	58.55	71.15	45.68	62.16	12.87	3.67	5.91	1.49
	1.5%	64.27	75.82	52.66	72.11	11.61	8.99	3.67	1.12
	2.0%	63.98	90.53	57.12	87.11	6.86	3.71	3.36	2.53
Zn	0. 5%	60.76	72.09	51.19	63.38	9.57	3.42	3.52	2.15
	1.0%	59.85	78.35	46.78	70.70	13.07	8.71	6.36	3.52
	1.5%	65.77	90.18	52.76	83.55	13.01	7.65	6.16	1.42
	2.0%	64.69	86.12	53.42	79.88	11.27	6.24	7.36	2.21
L.S.D$_{0.05}$%		1.86	2.04	0.84	1.19	0.91	0.07	0.24	0.36

Table 5: Effect of spray treatments with some micronutrients on chemical constituents of damsisa plants (Ambrosia maritime L.).

Treatments		Non-reducing sugars mg/g F.W.		Total free amino acids mg/g F.W.		Crude protein %		Total indols mg/g F.W.	
		2000	2001	2000	2001	2000	2001	2000	2001
Control		5.03	4.68	3.57	2.46	18.63	19.69	0.88	1.11
Fe	0. 5%	6.89	5.09	3.23	1.98	19.50	19.94	1.39	1.29
	1.0%	5.18	2.56	2.19	1.43	18.13	19.75	1.33	2.01
	1.5%	9.04	3.92	1.79	1.36	19.44	20.06	0.98	1.19
	2.0%	4.29	0.54	1.49	0.99	19.94	20.56	0.96	2.50
Mn	0. 5%	7.49	5.60	3.94	1.70	19.19	20.56	1.35	1.50
	1.0%	6.96	7.50	1.46	1.25	19.19	20.19	2.11	1.39
	1.5%	7.94	2.59	2.12	1.61	19.69	19.18	1.32	1.53
	2.0%	3.50	0.89	3.26	1.94	18.63	21.13	2.99	2.99
Zn	0. 5%	6.05	6.56	1.52	1.59	19.88	22.44	2.05	1.46
	1.0%	6.71	4.13	1.72	0.91	20.56	22.25	2.14	1.51
	1.5%	6.85	5.21	3.65	1.12	18.69	18.69	1.90	1.76
	2.0%	3.91	4.73	3.88	1.03	20.63	22.88	3.39	2.53
L.S.D$_{0.05}$%		0.01	0.04	0.07	0.05	0.27	0.32	0.05	0.03

Total free amino acids:

Results in Table (6) indicated that total free amino acids attention within side the plant leaves accrued within side the first sample changed into more than within side the second one. The facts additionally display that general loose amino acids have been reduced substantially within side the second sample because of spraying the plant life with Fe, Mn or Zn in any respect rates. This lower can be due to that amino acids disappear and mixed collectively for protein formation as proven within side the equal Table (6).

Crude protein:

Present effects in Table (6) display that crude protein attention withinside the plant leaves accrued within side the second sample changed into more than within side the first one. In addition, crude protein improved within side the leaves because of micronutrients remedies as proven in Table (6). The handiest remedies have been Fe, Mn or Zn at 2.0% within side the second sample. The percent of growth reached 4.41, 7.31 and 16.20 % for Fe, Mn or Zn, respectively, over the control.

Total indols:

The effects acquired on total indols are offered in Table (6) verified that, all remedies substantially improved total indols within side the samples. The advanced remedies in this recognize have been Fe, Mn and Zn at 2.0% within side the samples. The percent of of increase reached 125.22, l69.36 and 127.92 % for Fe. Mn or Zn, respectively, over the control within side the second sample.

Table 6: Effect of spray treatments with some micronutrients on chemical constituents of damsisa plants (Ambrosia maritime L.).

Phenolic compounds:

Data in Table (7) confirmed truly that free phenols concentrations of damsisa plant leaves commonly reduced within side the leaves accumulated within side the second sample than that within side the first one. On the alternative hand, the records display a marked boom in conjugated phenols attention within side the plant leaves accumulated within side the second sample than that within side the first one. Also the effects in Table (7) display that free phenols reduced commonly and conjugated phenols multiplied drastically due to micronutrients remedies as compared with control. The trend was true within side the samples. In addition, the reduction in free phenols contrasted with the boom in total indols i, e. endogenous promoters multiplied and therefore endogenous inhibitors reduced withinside the leaves which brought about growing in plant increase parameters which includes plant top and variety of branches as proven in Table (2).

Treatments		Conjugated phenols mg/g F.W.			Free phenols mg/g F.W.		N %		P%
		2000	2001	2000	2001	2000	2001	2000	2001
Control		0.89	1.13	3.55	1.19	2.98	3.15	0.15	0.16
Fe	0. 5%	3.42	3.42	2.06	1.11	3.12	3.19	0.16	0.18
	1.0%	3.72	3.72	2.43	0.53	3.12	3.16	0.16	0.19
	1.5%	2.57	2.57	0.55	0.55	3.11	3.21	0.16	0.20
	2.0%	3.27	3.27	1.94	0.38	3.19	3.29	0.18	0.18
Mn	0. 5%	1.31	1.31	0.54	0.57	3.07	3.29	0.16	0.18
	1.0%	3.68	3.68	1.66	0.65	3.07	3.23	0.16	0.19
	1.5%	2.85	2.85	0.67	0.67	2.98	3.18	0.16	0.19
	2.0%	1.71	1.71	0.70	0.32	2.98	3.18	0.18	0.18
Zn	0. 5%	2.20	2.20	0.87	0.91	3.15	3.38	0.16	0.18
	1.0%	2.53	2.53	0.41	0.54	3.29	3.59	0.16	0.19
	1.5%	1.45	1.45	1.01	0.99	3.99	3.27	0.18	0.18
	2.0%	3.86	3.86	2.33	0.40	3.30	3.66	0.19	0.20
L.S.D$_{0.05}$%		0.04	0.03	0.11	0.03	0.23	0.07	0.01	0.01

Table 7: Effect of spray treatments with some micronutrients on chemical constituents of damsisa plants (Ambrosia maritime L.).

Nitrgen, phosphorus and potassium concentration:

Data in Table (7&8) display that N, P and K changed into more within side the leaves of second sample than within side the first one. However the provided records in Table (7&8) commonly display that N .P and K percent changed into elevated as a end result of Fe, Mn and Zn remedies. The excessive attention of those nutrients on the attention 2.0% have been the maximum effective.

Fe, Mn and Zn concent(ation):

It changed into glaring from the records found in Table (8) that

Fe, Mn and Zn changed into more withinside the leaves of second sample than withinside the first one. The records additionally display that every one remedies elevated the content material of Fe, Mn and Zn in dry herb of damsisa. These quantities of micronutrients withinside the herb are nonetheless within the suitable degrees of micronutrients.

Treatments		K%		Fe (mg/g)D.W.		Mn (mg/g)D.W.		Zn(mg/g)D.W.	
		2000	2001	2000	2001	2000	2001	2000	2001
Control		2.07	2.98	7.24	9.33	0.09	0.14	0.18	0.23
Fe	0.5%	2.29	3.67	9.44	9.93	0.12	0.16	0.19	0.21
	1.0%	2.29	3.67	9.96	10.53	0.10	0.15	0.21	0.30
	1.5%	2.52	3.44	9.88	10.70	0.13	0.15	0.28	0.28
	2.0%	2.29	3.67	10.62	10.73	0.16	0.18	0.30	0.35
Mn	0.5%	2.07	2.98	7.01	9.33	0.15	0.20	0.19	0.20
	1.0%	2.07	2.99	7.26	9.85	0.18	0.19	0.20	0.31
	1.5%	2.52	3.21	7.40	9.67	0.18	0.22	0.19	0.33
	2.0%	2.17	3.90	9.38	9.53	0.20	0.23	0.27	0.32
Zn	0.5%	2.07	3.21	8.40	10.04	0.10	0.15	0.34	0.40
	1.0%	2.52	3.21	6.48	9.21	0.11	0.15	0.36	0.38
	1.5%	2.61	3.36	6.85	9.48	0.13	0.15	0.33	0.44
	2.0%	2.84	3.90	8.82	9.33	0.16	0.16	0.39	0.45
L.S.D$_{0.05}$%		0.01	0.02	1.53	1.35	0.08	0.05	0.09	0.10

Table 8: Effect of spray treatments with some micronutrients on chemical constituents of damsisa plants (Ambrosia maritime L.).

Sesquiterpene lactones:

Data tabulated in Table (9) indicated that Fe, Mn and Zn spraying had a stimulative impact on sesquiterpene lactones in damsisa vegetation all through the successive seasons in comparison with control.

Concering the impact of Fe awareness on sesquiterpene lactones, the statistics display that everyone quotes used expanded notably sesquiterpene lactones withinside the seasons in comparison with control. The maximum effective remedies had been Fe, Mn or Zn at 2.0% withinside the seasons. The percent of boom reached (22.51, 20.35and 27.76 %) for Fe, Mn or Zn. respectively, over the control.

Treatments		Total sesquiterpene mg/g D.W.		
		2000	2001	Men
Control		11.43	9.88	10.66
Fe	0.5%	13.00	12.63	12.82
	1.0%	11.67	9.93	10.80
	1.5%	11.66	10.09	10.88
	2.0%	13.63	12.49	13.06
Mn	0.5%	11.79	10.94	11.37
	1.0%	12.79	11.50	12.15
	1.5%	12.98	11.55	12.27
	2.0%	13.30	12.36	12.83
Zn	0.5%	12.05	11.45	11.75
	1.0%	12.51	11.54	12.03
	1.5%	14.07	12.65	13.36
	2.0%	14.46	12.77	13.62
L.S.D$_{0.05}$%		0.89	1.06	0.97

Table 9: Effect of spray treatments with some micronutrients on total sesquiterpene of damsisa plants (Ambrosia maritime L.).

Discussion:

It is apparent from the gift data that the micronutrients remedies expanded the plant height. This rise may be due to the critical function of Zn in synthesis of tryptophan amino acid and therefore formation of auxins i.e. IAA that's essential to cell division and its elongation and act as growth regulator especially in growing plant height (Devendra et al.,1999).

The stimulating impact of the used micronutrients on plant growth and flowering can be due to their function in transmission of the electron from water to chlorophyll and generating oxygen gas within side the photosynthesis further to their role within side the nitrogen metabolism through activated nitrate reductase enzyme (Baza, 1981).

Moreover, the increasing impact of the used nutrients on stem diameter may be because of their stimulative impact on cell division and expansion (Devendra et al.,1999).

Also, the increase in herb fresh and dry weight/plant came about through sparing with micronutrients can be attributed to that the preliminary awareness of Fe, Mn and particularly Zn withinside the soil changed into low to satisfy the plant call for these nutrients (Attia. 1999).

In this respect, Attia (1999) stated that, spraying faba bean leaves with Fe. Mn and Zn in a chelated shape has brought about a considerable growth within side the yield because of enhancing the physiological overall performance of the handled flora and growing the dry weight and quantity of pods in step with plant observed through an growth within side the awareness of those nutrients within side the leaves. This growth changed into

paralleled with the growth in plant top and stem diameter. Generally, micronutrients treatments increased leaves total and non-soluble carbohydrates. Fe, Mn or Zn treatments were the most effective treatments, respectively. This may be due to the time stimulating effect of these nutrients on chlorophyll formation and consequently photosynthesis (Price et al., 1972). Moreover, Ghabour (1992) located that the utility of micronutrients increased the flowering degree and as a result boom the flowering capability and yield of seeds.Moreover, micronutrients remedies increasing chlorophyll and carotenoids. This increase may be due to that Fe, Mn and Zn enhancement chlorophyll formation (Mohr and Schopfer, 1995).

In addition, the lower in total and reducing sugars via way of means Fe, Zn or Mn application can be attributed to the excessive capability of the plant sprayed with this micronutrient in constructing total and non-soluble carbohydrates from the simple sugars, which decreased. Price et al. (1972) determined that fundamental function of zinc in plant is associated with its position within side the metabolism of carbohydrates.

In this connection Refaat and Balbaa (2001) on lemongrass, discovered that addition of micronutrients aggregate had a nice impact on crude protein contents. This boom in protein with the aid of using Fe, Mn or Zn utility primary characteristic of zinc in plant is related to its position within side the metabolism of carbohydrates, proteins and phosphate (Price et at, 1972). Its characteristic is an element or cofactor for a variety of enzymes (Amberger, 1991). The gift consequences are in settlement with the ones received with the aid of using by Mohamed et al.(2001) on hibiscus sabdariffa L. .Who concluded that the boom in total indols have been attributed to that Mn performs a position in regulating the extent of auxins in plant tissues with the aid of using activating the auxin oxidase system (Russell. 1989) additionally Zn performs a position in synthesis of tryptophan amino acid and therefore in formation of herbal auxin in plants i.e. indole-3-acetic acid (IAA).

In this respect, Sagi and Garay (1961) confirmed that phenolic impact on plant increase became contributed to both antagonism with IAA pastime The boom in conjugated phenols can be attributed to the boom within side the metabolic pastime within side the treated plants and to synthesis of shikimic acid (Devlin amid Withman, 1985). Similar effects had been additionally acquired through Mohamed et al. (2001) on Hibiscus sabdariffa L.

On this concern Khattab and Omar (1999) on a few Apiaceae plants and Refaat and Palbaa (2001) on lemongrass, determined that the application of micronutrients mixture (Fe, Mn amid Zn) had extended nitrogen, phosphorus and potassium percentage. This boom can be because of the impact of Zinc on biosynthesis of auxin (IAA) which promote rooting procedure and therefore the quantities of mineral factors absorbed and trans placed into the distinct components of the plant (Devlin and Witham, 1985), on the alternative aspect Sidky and El-Mergawi (1997) determined on damsisa plant that good manufacturing of sesquiterpene lactones became determined in plants fertilized with K at 80 Kg/fedden in mixture with either 40 Kg N/fedden for the first and second cuts or 60 Kg N /fedden for the third cut. Wittwer and Bukovar (1969) determined that application of micronutrients progressed root increase main to more absorbability floor of the roots. These These records are according with the ones acquired through El-Sherbeney& Hussein (1991) on coriander and Tarraf et al. (1994) on Rosmarinus officinalis L. Who determined that implemented micro-elements micro- extended micro-elements? In this respect, El-Gadban, (1994) on spearmint and Gamal El-Din et al. (1997) on lemongrass mentioned that the great and amount of many crucial oils had been suffering from the application of micronutrients mixture (Fe, Mn and Zn).

Conclusion:

From the existing effects it is able to be concluded that the application of Fe, Mn or Zn substantially improved herb yield in addition to amount of its chemical parts because of that those nutrients take part withinside the different metabolic approaches which improved synthesis of chlorophyll and consequently improved the total and non-soluble carbohydrates. Moreover, Fe, Mn and Zn improved the essential nutrients uptake including N, P and K which improved the manufacturing sesquiterpen lactones in leaves and flowers. The improved in total nitrogen cause increase synthesis of crude protein from total free amino acids which it decreased. Also, the increase in potassium uptake by spraying with the studied nutrients led to an increase in protein, starch and essential oil synthesis. Moreover, the used micronutrients might be used for buying an exceptional herb yield with exceptional main lively parts (sesquiterpen lactones).

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