Journal of Applied Science and Agriculture, 9(1) January 2014, Pages: 63-67

AENSI Journals

Journal of Applied Science and Agriculture

ISSN 1816-9112

Journal home page: www.aensiweb.com/jasa/index.html

Effect of Irrigation with Wastewater Sandblast Shirvan City on Vegetative and Reproductive Growth of Seasonal Flowers Viola

[1]Isaac Rabie, [2]Gholam Ali Velizade

[1]*Department of Agriculture, Shirvan Branch, Islamic Azad University, Shirvan, Iran.*
[2]*Department of Agriculture, Shirvan Branch, Islamic Azad University, Shirvan, Iran.*

ARTICLE INFO

Article history:
Received 18 November 2013
Received in revised form 21 December 2013
Accepted 27 December 2013
Available online 1 March 2014

Keywords:
Irrigation, Seasonal, Flowers, Sandblast waste, Violet

ABSTRACT

Background In order to determine the effect sandblast waste on the growth of seasonal flower of Violet administered one experiment in pot and in a completely randomize design with three replications and five treatments. Treatments in use were mixing ratio of water and sandblast waste including T_1=100% sandblast water, T_2=75% sandblast water + 25% sandblast waste, T_3= 50%sandblast water+50% sandblast waste, T_4=25% sandblast water+ 75% sandblast waste and T_5= 100% sandblast waste that applied on seasonal flower of Violet. Parameters measured were plant height, number of leaf and flowers, first day of flowering, chlorophyll and soil EC levels that was measure in both of stages of vegetative and reproduction growth. **Results:** Results indicated that significant relationship exist between sandblast waste and the five treatments. Irrigated plants with 100% sandblast waste had the higher growth rate in comparison with other treatments due to nutrients.

To Cite This Article: Isaac Rabie, Gholam Ali Velizade., Effect of Irrigation with Wastewater Sandblast Shirvan City on Vegetative and Reproductive Growth of Seasonal Flowers Viola. ***J. Appl. Sci. & Agric.,*** *9(1): 63-67, 2014*

INTRODUCTION

These days, using of sandblast waste was considered as a polluted source as a source abundant of fertilizer elements of plant which have long background. Asymmetric distribution of rain falls at different areas lead to dry and mid dry climate. Although, these areas have potential ability, at development are encountered with numerous limiting factors. For development at these areas with exact planning and management can observed flourishing of economical, cultural, and social. These days, water does not consider as an infinite blessing but governments and scientist have discovered that water resources use maximum utilization with minimum waste. Management of water resources consider a part of countries development planning and every country on basis of water resources of available was performance strategy and special plan for optimum use of water resources. Due to relationship of agriculture with water and nature is affected from water stress. Generally, dry areas suffer from low rainfall and dehydration that in comparison with rainy areas have different agriculture conditions. Agriculture in arid areas due to drought, flood, and desertification at various years need compatible strategy and plans with this climate. However, developing countries due to lack of smart management on water resources and lack of use of strategy and above strategy damage more than water stress and drought (Emami, 2006).

Methodology:

This study is trying effect of irrigation with sandblast waste on growth of seasonal flower of violet in planted at green house of municipality green place was run for 4 month in 2012 in city of Shirvan. Experiment in pot implemented in a randomized design with three replications and five treatments. Treatments of in surveying of irrigation with sandblast waste containing different proportions of mixing well water of sandblast and sandblast waste is as followers:

T_1: irrigation with well water (100%)
T_2: irrigation with 75% well water +25% sandblast waste (effluent)
T_3: irrigation with 50% well water +50% sandblast waste (effluent)
T_4: irrigation with 25% well water +75% sandblast effluent (waste)
T_5: irrigation with sandblast effluent (waste) (100%)

Corresponding Author: Gholam Ali Valizadeh, Department of agriculture, Shirvan Branch, Islamic Azad University, Shirvan, Iran.

Journal of Applied Science and Agriculture, 9(1) January 2014, Pages: 63-67

Soil in post was containing perlite + sand. First, for better drainage were put some stone in the end of pots and then pots filled with sand and perlite. Water in need for experiment was well water of sandblast and sandblast waste related to waste of sandblast factory.

Seedlings in use provide from green house of municipality of Shirvan in early Dei and in pot planted 2 same size and same diagonal seedlings. the pots were irrigated with common water for 10 days to adapt to the new conditions. The experiment began in mid- Dei and irrigating took place at time of need of plants. Using of irrigation maintained soil moisture of pots during plants growth at agriculture capacity.

Irrigation was done in the evening, and from containers five were used for measurement of water of irrigation. Furthermore, mixing proportions was calculated. During the experiment, weeds of pots were removed by hand and one turn of spraying with insecticide diazinon was done for control of green house insect. First, factors measurements were record manually and then computer excel. Factors were measured in both stages of flowering time and vegetative growth and two stages were analyzed factors of measured included: plant height, number of leaf and flower, date of first flowering, content of chlorophyll and soil EC.

At vegetative stage were measured number of leaf, chlorophyll content, plant height at flowering time were measured plant height, number of leaf and flower, first day of flowering, chlorophyll content and soil EC. Measurements took from mid – Dei to mid ordibehesht every 20 days in early morning.

As in this time, 6 series was measured, that is 3 times in vegetative stage and 3 times at time of flowering. Measurements of factors of number of leaf, and flower and first day of flowering were eyely. Measurements of plant height from surface of pot to tip of leaf took by ruler and on centimeter. That is, one white leaf was placed on the surface of pot and height was measured with ruler. Cause using of A4 sheet is depth of plating in pots that don't make error in measurement of height.

Discussion:

For measurements content chlorophyll used chlorophyll meter; every plant divide to 3 part and from every part record 3 number and then total of thin 9 number considered as chlorophyll content of plant. For determing of soil EC of post, first, flower plants remove from in pot, Then perlite and sand mix in pot and then it weight by scale and for every pot separated one 50 grams samples and was put in disposal container. 45 soil samples were transported to the laboratory. Then samples were saturated with distilled water and had been abandoned for 24 hours. Later using of the funnel and filter paper took their extract and soil EC level of post was measured with EC meter. In two stage were measured before and after experiment. Measurement of soil EC took in the morning and its unit was ds/cm. After data collected, for computing of statistical used MSTAT-C software and comparison of means took by Dun cańs multiple range tests at 5% and 1% level. For drawing of graphs was used from Excel software.

Table 1: the results of analyze variance of irrigation of violet flower with sandblast waste at stage of vegetative growth

Mean of qualities squares			class	Resource
Chlorophyll content	Number of leaf	Height	Freedom	variation
22,325**	10,13**	3,91**	4	Treatment
1,116	4,604	0,391	10	error test
2,862	12,1	6,8		Coefficient of variation (CV %)

It is significant at1percentage probability level and is not significant

Table 2: comparison of mean of mixing proportions water and sandblast waste on violet flower on stage of vegetative growth

Chlorophyll content (SPAD	Number of leaf	Height(cm)	Treatment (waste content)	type of seasonal flower
34 D	12 D	7 B	0%	violet
37 C	14 D	5 C	25%	
38 C	16 C	7B	50%	
40 B	17 B	8 A	75%	
43A	19 A	7 B	100%	

The mean of each column having the same letters that at 5% probability level are significant without different by Duncan test effect of irrigation treatment with mixing different proportions of water and sandblast waste was significant at flowering time of violet, as number of leaf, plant height, number of flower, first day of flowering, content chlorophyll and soil EC level was significant at 1% probability level. Maximum of plant height (43 cm) and the lowest of it (34 cm) have observed at 100% and 0% sandblast waste, respectively. The maximum number of flower (6) and the lower of its (2) was at treatment of 100% and 0% sandblast waste, respectively. Highest number leaf (32) and lowest of it (72) was at treatments of 100% and 0% sandblast waste, respectively. Earliest flowering (21) provided with treatment 0% sandblast waste. Effect of treatment of mixing different proportion was significant on chlorophyll content and highest chlorophyll content (40) obtained from treatment 100% sandblast waste. Highest amount of soil EC (7 and 4 ds/ cm) and to west amount of it (1 and 4 ds/ cm) was observed at treatments 100% and 0 % sandblast waste, respectively.

Journal of Applied Science and Agriculture, 9(1) January 2014, Pages: 63-67

Table 3: results analyze variance of violet flower irrigation with sandblast waste at flowering time

Mean of qualities squares						class freedom	Resource variation
Soil EC content (ds/cm)	Chlorophyll content (SPAd)	first day of flowering	number of flower	number of leaf	height(cm)		
0,26	5,936*	271,2	251,3	44,12**	21,33**	4	Treatment
0,008	2,815	47545,	0,430	6,637	4,309	10	error test
2,476	4,345	17,046	26,62	9,850	20,37		Variation Coefficient (CV %)

Table 4: comparison of mean of mixing different proportions of water and sandblast waste on violet flower at flowering time

Soil EC content(ds/cm)	Chlorophyll content(SPAD)	First day of flowering	Number of flower	Number of leaf	Height (cm)	treatment(waste content)	Kind of seasonal flower
4.5 b	38 b	24 a	4 c	32 a	38 C	50%	calendula
4.5 b	37C	23 b	5 b	31b	40 b	75%	
4.7 a	40a	22 c	6 a	32 a	43 a	100%	

Parameter of measurement of sandblast waste:

Measurements performed in sandblast waste of Shirvan show that amount of measurement parameters at sandblast waste is higher than to well water of sandblast. The PH of 7 is neutral that it is suitable for irrigation. Another feature of irrigation water is salinity or EC that sandblast waste is at limit of permissible and it is rich for nutrients in needing of plant such nitrogen, phosphorus and potassium. with regard to results of this test, using of sandblast waste on measurement factors was effective and it was significant at 1% and 5% probability level 1; as amount of violet flower growth has increased with increasing of waste percent; this was true in many of factors.

Researches of researches of Shend (1988), Papadopoulos, and stylianon (1991) show better effective of refined waste than to chemical fertilizer about absorb of plant elements. Researches of petty grove and Asano show that amount of high nitrogen in waste increase performance of plant. In general, the use of wastewater at irrigation can be as a source of full of nutrients (Alizadeh 1997, Matin 1993, Feigin 1991).

High concentration of nutritional elements of nitrogen, phosphorus, potassium, calcium, and magnesium is due to entrance of water rain along with desirable soil erosion. Irrigation with sandblast waste increase amount of soil nutrients (meli *et al* 2002, Bagheri 2000 , safari sanjabi 1995). In addition, other researchers (Bahae and sing 2005, Philips *et al* 1986, stewart and Flinn 1984) reached similar conclusions.

Effect of treatments on number of leaf:

Amount sandblast waste available in irrigation water affected significantly on number of at vegetative stage at flowering time at 1% probability level. At vegetative stage obtained maximum of violet leaf number (19) at treatment 100% sandblast waste. At violet, use of wastewater increased number of leaf significantly. At flowering time, maximum of leaf number at violet (32) observed with 50% and 100% sandblast waste. Sandblast waste increased performance due to different nutrients elements. number of high leaf increase photo synthesis and thus increase performance production. Rahimi (2011) show effect of irrigation with wastewater on growth of ornamental shrubs of mint and orange box tree and new leaf that irrigation with waste has increased number of leaf at shrubs of orange box tree with 100% waste. Results of sabye *et al* (1990) show that at two species of wormwood and Atriplex long of plant leaf was higher significantly in patches of with waste than to other patchs. Danesh *et al* (1991) investigated effects of domestic refined waste on quality of sugar beets and fodder beets that increased number of leaf in use of sandblast waste. At research that Nazari *et al* (2002) perfumed effect of waste and waste effluent on soil and agriculture plant growth (wheat, barley, maize) and ornamental (grass, geranium, begonia, Atlas, calendula, parsley), indicator of leaf number was high at treatment well water+ effluent than to other treatments.

Effect of treatments on soil EC:

effect of mixing different proportions water and sandblast waste on soil EC content of violet pots are significant at 1% probability level. Maximum of soil EC content in violet pots (4/7 ds/ cm) was obtained with 100% sandblast waste. Increasing of soil electrical conductivity is itself a limit factor that must be pay attention when using of wastewater.

According to research of Nazari *et al* (2003) observed effect of waste water and industrial effluent on soil and agriculture plants growth (wheat, barely, maize) and ornamental (grass, geranium, begonia, Atlas, calendula, parsely) that soil EC content hid highiest of content at treatment of waste water of refined over

flowering and exit waste water in river. Results of research kasraee and saedi (2010) show effect of sewage sludge of Tabriz petrochemical complex on growth of tomato plant that increasing of concentration of all soluble salts (EC) and partly PH of tomato soil in pots have had many chaging at first and the end of pot test with increasing of biological effluent, As this was proposed soil salinity and damage of its in many agriculture plants of sensitive to salt. Alizadeh (1997) stated using of refined waste water at irrigation of sugar beet that application of kinds of irrigation water and different vegetables planting impact on soil saturated hydraulic conductivity and significant increasing of its has provided in comparison of with initial value. Results of Hassan Aghli *et al* (2005) on seeking position of soil saturated hydraulic conductivity at irrigation with effluent and refined effluent its state that the two – year use of kinds of irrigation water and vegetable cultivation increase soil saturated (EC) hydraulic conductivity in comparison of initial level, Therefore, that most of increase was obtained in use of parsley cultivation and raw waste water.

Results:

The results of analyst of variance show that effect of treatment, irrigation with mixing proportions of water and sandblast waste was effective at stage of violet vegetative growth; as plant height and chlorophyll content and number of leaf were significanting at probability level 1%. This means that with increasing of sandblast waste proportion have increase plant heights, number of leaf and chlorophyll content. Maximum plant height (8 cm) has been observed at treatment 75% sandblast waste and the lowest its (5 cm) has been observed at treatment 25% sandblast waste. Greater number of leaf (19) and the lowest of its (12) were observed at treatment 100% and 0% sandblast waste respectively. Highest of chlorophyll content (43) and the lowest its (34) observed at treatment 100% and 0% sandblast waste, respectively.

Conclusion:

In general, comparison of growth indicators of violet plants show that treatment of sandblast waste has significant effect in most cases. Using of sandblast waste due to nutrient elements such as Nitrogen, Phosphorus can improve plants growth increasingly. with regard to results of test and similar test can advise that sandblast waste can be suitable substitute for irrigation of flowers and green place because in addition to provide of irrigation water and also economizing at sandblast wastewater consumption can use fresh green place without concerning from devastating effect on society health. Of course, use of sandblast waste should be done to study and continuous controlling of soil's features in order to prevet adverse effects on soil fertilizing. This can be tested on other flowers and ornamental shrubs in landscaping and agriculture and Afforestation.

Moreover, we can use other factors such as effect of mixing different proportions of water and sandblast waste on standards of vegetative growth and flowering time of seasonal flowers of calendula, violet and wall flower. We can study other factors such as kind of soil, effect of sandblast waste on elements of plants and soil.

REFERENCES

Aghll, A.R., A.M. Liaghat, Mirab zadeh, 2005. study of changes in soil saturated hydraulic conductivity at result of performance of irrigation with domestic and refined sandblast waste, the journal of research – science agriculture, 11 th, No. 4.

Alizadeh, A, use of refinery effluent of sandblast waste at irrigation of agriculture crops, weekly publication of shahr of Ab, preesof water engineering and sandblast waste firm, No. 4

Alizadeh, A., use of refined sandblast waste at irrigation of sugar beet, ministry of energy, firm of water engineering and sandblast waste, final report of research project.

Bagheri, M., 2009. Effects of sandblast waste and irrigation systems on some properties of physical, chemical and soil polluted and some crops, thesis of master, Isfahan university of industrial, Faculty of agriculture.

Danesh, sh, Haghnia, 6 h and A. Alizadeh, 2001. effect of sandblast waste of domestic refined on quality of sugar beet and fodder beet, final report, Department of ferdowsi university of Mashhad

Emami, k., 2006. Reduce. The risk of dams by methods of non-structure (case study: Karkheh early dehydration) fourth conference of dam.

Rahimi, N., 2011. effect of irrigation with sandblast waste on growth of orange and mint box tree shrubs and new leaf, Thesis of master of gardening, open university of Shirvan.

Kasraeei. R and S. saedi, 2010. effect of sewage sludge of Tabriz petrochemical complex on growth of tomato plant, soil and water journal (agriculture of sciences and industries), 24(1): 10-20.

Matin, 1993. irrigation with sandblast waste, solution for water scarcity, journal of research and construction, 25: 18-22.

Nazari, M., A.H. shariatmadari, M. Afyoni, M. Meli and Sh. Rahili, 2006. effect of use of waste and industrial effluent on concentration some elements and performance of wheat, barely, maize, sciences and technology of agriculture and natural resources, 10th year, No.3.

Journal of Applied Science and Agriculture, 9(1) January 2014, Pages: 63-67

Nazari, M., H. shariat madari, M. Afyoni, meli, 2002. effects of waste and industrial effluent on soil and growth of agriculture and ornamental plants, thesis of master of soil science, Isfahan university of industrial.

Rahimi, Mirzaei, N. and M. mahdavi, (translation) 2009. sandblast waste purification in developin countries, published in Nohfeh with engineers of pars Ab Tadbir, first edition, pp: 1-6, 37-39, 205- 222.

Salehi, A., M. Tabari, G. Mohammadi and A. Ali Arab, 2008. effect of irrigation with sandblast waste on soil and growth of Tehran pine trees, quarterly journal of research – science of research of forest and black poplar in Iran, 16(2): 186-196.

Safari sanjabi, A., 1995. outcome of irrigation with sandblast waste (sandblast waste treated) on some chemical properties of soils of Barkhar in Isfahan and accumulation some element at alfalfa plant, Master thesis, field of soil science, Isfahan university of industrial.

Sharifi, M., M. Afyoni and A.m. khoshgoftar manesh, 2011. effect of sandblast waste of polyacryl factory, sandblast waste com post and manure on avail ability of Fe and Zn absorb in soil and their absorb by maize, alfalfa and parsely flower in green house, journal of sicence and Technology of Agriculture and Natural Resources, Soil and water sciences, 15 th year, No. 58.

Steki, A.A., 2003. the effect of construction of dam on temperature variation, PH, salinity, alkalinity and hardness of water in the river of Hanna (Semirom), Journal of fisheries Iran, 12: 1-20.