Effect of spraying yeast and Urea fertilizer on some vegetative properties of rose plant

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Abstract - This experiment conducted in Location of Horticulture department / Raparin university during 15th March to 5th May 2019, to study the effect of different level of Yeast and Urea some vegetative propertieson growth of Rose plant.This experiment included the study of four levels of dry yeast extraction (0, 2.5, 5 and 7.5 g/L), and four levels of Urea extraction (0, 2.5, 5 and 7.5 g/L) and their interaction, The plants were sprayed with dry yeast and Urea extractions just after the emergence of the second true leaf until beginning of flowering and every 10 days.Results showed that increasing of foliar application of active dry yeast concentration up to 5 g/l increased the vegetative growth characters of Rose plants in terms of plant length, leaf area and number of brunch of whole plant. Moreover, increasing of Urea concentration up to 5gmdecreased the vegetative growth characters as mentioned above. Addition of foliar spray of yeast at 7.5 g/l. along with foliar spray of Urea at 2.5gm resulted in the highest values of the above mentioned plant growth. The experiment was laid out in pots in a factorial completely randomized design (CRD) with three replications, means were compared using Duncan's Multiple Range Test (P≤0.05).

Key Words : Yeast , Urea , Rose plant , Plant length , Flower area , number of brunch

Introduction

Roses are one of the beautiful and most popular flowers among many floriculture crops of the world. The rose derived from the Latin word "Erose" meaning the "God of love" (Rajesh and Ramesh, 1999). Rose belongs to genus Rosa, sub family is Rosoideae and family Rosaceae (Man et al., 2010). The rose has 200 species and more than 20,000 varieties (Gauchan et al., 2009). Miniatures roses are a type of roses that are smaller in mass. They are perfect for glass boxes, pots and containers, typically grown to about 35cm and can have double or semi-double flowers (Cushman et al., 1994). These are enormous to add colors and scented to a home or closed garden.

Nitrogen has many functions in all division, the synthesis of proteins, protoplasm, enzymes and organic compounds as nucleoproteins, amino acid and chlorophyll. The improving effect of N applied via foliage al yield, Fruit quality was emphasized by the results of AKL et al., (1997) and Abdel-Hady (1995). Moreover, born plays an important role in flowering and fruiting processes, biosynthesis and translocation of carbohydrates, movement of the natural hormones and the encouragement of both cell division and cell enlargement (Nijjar, 1985). Recently, the bio-fertilizer active dry yeast was found enhance grape yield and physical of chemical characteristics of berries (Ahmed et al., 1997 and Normier, 2000) Urea can be sprayed on leaves and can also be mixed with insecticides or herbicides for soil application. A urea ammonium nitrate mixture with herbicide is also used for weed control , in the present world, flower becomes important not only for its aesthetic social values, but also for its economic contribution (Aditya, 1992; Dadlani, 2003). People usually use flowers in all their ceremonies like wedding, birthday and marriage day greetings, religious offerings and sometimes in social, political and historical occasions. The universal usage has created a real trend of producing flower on a commercial basis to meet increasing demand in the market. The area under rose cultivation was 111 ha producing about 2423 tonnes with an average yield of 21.92 t/ha.

Nitrogen is an important element involved in protein and chlorophyll biosynthesis, which ultimately affects photosynthetic rate and accumulation of food reserves (Thanapornpoonpong et al., 2008) and thereby affects good plant growth as revealed in carnation (Chaudhary, 2007), gladiolus (Bijmol and Singh, 2003) and lilium (Rani et al., 2005), tuberose (Singh, 2000). Although research with regard to nutrition management in cut roses cultivated under open conditions has been well documented (Cabrera 2004) but that under protected conditions is meager. The present investigation was under taken in order to study the effect of various levels of nitrogen on growth and flowering of cut rose flowers

Certainly, the true challenge seemed to be in finding out and experimenting a new cultural practice which is easy, economical , safe and promising through foliar applications of urea and dry yeast extract at proper time of flower bud induction and initiation which might participate in the fulfillment of this goal. Rose is an important cut flower appreciated as Queen of flowers. Under field conditions, roses respond well to fertilizer application. In addition to the basal dose of well decomposed FYM, rose requires 200-400 kg of N/ha. This dose may be split into two, once at pruning and the second dose after about 20 days. The requirement of phosphorus and potash can be met by adding 150 kg/ha of each at the time of pruning. ((Liu & Liu 1998, Lovatt 1999 a, El-Tanany 2003 and El-Tanany & Abdel Messih 2009)

Also confirmed from (Lonhienne et all 2014) that addition of live or dead yeast to fertilized soil substantially increased the nitrogen (N) and phosphorus (P) content of roots and shoots of tomato (Solanum lycopersicum) and young sugarcane plants. Yeast addition to soil also increased the root-to-shoot ratio in both species and induced species-specific morphological changes that included increased tillering in sugarcane and greater shoot biomass in tomato plants.

Materials and method

The experiment was carried out at the vegetative research farm, Horticulture Department, University of Raparin under plastic house during the season of 15th March to 5th May 2019 to study the effect of bread yeast(0, 2.5, 5, 7.5)gm/l and Urea extract (0, 2.5, 5, 7.5)gm/l on plant growth, Flower dimeter , number of brunch and plant length. The flower cut was cultured in 15th January in a pot. The Mix that use to culture the cutting was mix 50% sand and 50% peatmoss then when the second true two leafs appear the spray started, four sprays were add yeast and urea and interaction between them with three replication The first spry in 15th March until beginning of flowering and every 10 days.The result us following :

1-Preparation of the dry yeast suspension:

The dry bread yeast suspension was prepared by melting certain weights(2.5 ,5, 7.5) (g) in a liter of distilled water , at a temperature (32 ° F) with sugar (sucrose) to activate the yeast and then placed in an incubator.(Chalutz et all 1977).

2- Preparation of the Urea suspension:

Urea suspension is prepared in the same way as the yeast suspension but without adding sugar

3- Preparation mix of the Yeast and Urea:

The suspension were prepared by mixed the different weight of yeast and urea in 1/litter of distilled Water.

Result and Dissuasion:

Effect of Foliar spray of Yeast and Urea suspension plant length (cm) , Flower area and number of brunch :

Data in Table (1),showed that vegetative growth characters of Rose plants were significantly affected by foliar application of yeast. Whereas, plant length, Flower area and number of brunch are gradually increased by increasing concentrations of yeast. The highest values of the plant length , Flower area and number of brunch (12.5)cm, (3.933)cm and (5.333) respectively mentioned significant effect plant growth characters were obtained with the highest concentration of yeast (7.5 g/l.). On the other hand, the lowest values of the plant length , Flower area and number of brunch(3.5) cm , (1.967)cm and (1.667) respectively in concentration of interaction between Yeast 2.5 gm and Urea 7.5gm , Urea concentration 7.5 and 5gm Urea were obtained with corresponding untreated plants. These findings were significant and true in experimental season. The statistical analysis of the obtained data revealed significant differences among the different concentration of yeast seasons growth .

Table (1) Effect of Yeast and Urea on Plant length, Flower area and number of brunch

treatments	Plant length	Flower area	Number of brunch
T1	8.333^{bcde}±0.333	3.033^{bcd}±0.033	2.667^{cdef}±0.333
T2	9.667^{bc}±1.333	3.333^{b}±0.167	3.000^{cde}±0.577
T3	6.300^{ef}±0.153	2.133^{fgh}±0.067	1.667^{f}±0.333
T4	4.267^{fg}±0.145	1.967^{h}±0.088	2.000^{ef}±0.000
T5	8.333^{bcde}±0.333	2.600^{def}±0.100	2.667^{cdef}±0.333
T6	10.500^{ab}±0.289	3.233^{bc}±0.145	3.333^{bcd}±0.333
T7	6.167^{ef}±0.167	2.267^{efgh}±0.145	4.333^{ab}±0.333
T8	3.500^{g}±0.289	2.100^{fgh}±0.058	2.000^{ef}±0.000
T9	9.000^{bcd}±1.155	3.433^{b}±0.233	4.333^{ab}±0.667
T10	8.000^{bcde}±0.577	2.500^{efg}±0.289	3.667^{bc}±0.333
T11	6.667^{def}±0.882	2.233^{fgh}±0.145	2.667^{cdef}±0.333
T12	6.333^{ef}±0.882	2.467^{efgh}±0.240	2.000^{ef}±0.000
T13	12.500^{a}±1.258	3.933^{a}±0.067	5.333^{a}±0.333
T14	9.667^{bc}±1.202	2.767^{cde}±0.145	3.667^{bc}±0.333
T15	7.667^{cde}±0.882	2.433^{efgh}±0.233	2.333^{def}±0.333
T16	3.833^{g}±0.441	2.067^{gh}±0.067	2.000^{ef}±0.000

The positive effects of dry yeast application were reflected on its considered as a natural source of cytokinins that stimulates cell division and enlargement as well as the synthesis of protein, nucleic acid and chlorophyll (Kraig and Heber, 1980; Spencer et al., 1983; Castelfranco and Beale, 1983 and Fathy and Farid, 1996). It also contains sugar, proteins, amino acids and vitamins (Shady, 1978).

The improvement of vegetative growth characters in response of to the foliar application of active dry yeast and Urea may be attributed to its content of different nutrients, higher percentage of proteins, higher values of vitamins, especially B which may play an important role in improving growth and controlling the incidence of fungi diseases (Meyer and Phaff, 1969 and Subba Rao, 1984). Therefore due to the role of nitrogen, which enters the building of amino acids in the formation of protein as well as being involved in the construction of chlorophyll, combining four atoms of nitrogen with a magnesium atom to form a chlorophyll molecule as well as its role in the construction of cellular membranes and vitamins, Vitamin B, which contributes to the total length of the plant and the number and breadth of the leaves and the number of lateral branches and the soft and dry weight of the plant and this is consistent with the statements of (Abudahi and others 1988 and Hopkins and Huner, 2004).

Recently, Sarhan and Abdullah, (2010) found that the positive effects caused by the addition of yeast suspension in improving shoots characteristics might be due to the development of the yeast after its analysis into wide groups of amino acids and vitamins. The nitrogen concentration increases up to 7.5 g. L-1 resulted in increased plant content of nitrogen and this had a negative impact on vegetative growth characteristics of plants, indicating the arrival to toxic concentration in the plant compared to plants that were treated with a concentration of 2.5 g and 5 g. L - 1, but it may significantly exceed the treatment of comparison and in all qualities and this may be due to the increase in the amount of nitrogen and reach the toxic limits, which leads to increased composition of protoplasm arising from the composition of the protein, which contains large amounts of water, this leads to water loss due to different concentration (1988) and differed with what Ahmed and Aly (1998) found when they fertilized five species of Leucaena spp.

The obtained results are in accordance with those reported by Gomaa et al. (2005) on potato; Hussain and Khalaf, (2007) on potao; El-Tohamy and El-Greadly, (2007) on Snap bean; El-Tohamy et al., (2008) on eggplant; Fawzy et al., (2010) on Snap bean and Ghoname et al., (2010) on sweet pepper. Likewise, Sarhan and Abdulah, (2010) on potato, found that the treatments of yeast suspension caused gradual significant increase in plant height, number of aerial stem per plant, leaves area, total chlorophyll, and shoots dry matter percentage.

Conclusion:

The results of the present investigation indicated that, foliar application of active yeast extract and Urea suspension the vegetative growth characters, improved flower quality, increased the productivity of Rose plant. Application of yeast at the concentration of 7.5 g/l. combined with application of Urea at the concentration of 2.5gm gave the highest values of vegetative growth characters. The results also support the fact that, the use of dry Yeast as a foliar spray leads to increasing plant growth which causes significant increases in Flower yield and Improve vegetative qualities of plants but oppositely increase the Urea concentration let to decrease the plant vegetative growth.

Not/

T1= Y0U0
T2=Y0U1
T3=Y0U2
T4=Y0U3
T5=Y1U0
T6=Y1U1
T7=Y1U2
T8=Y1U3
T9=Y2U0
T10=Y2U1
T11=Y2U2
T12=Y2U3
T13=Y3U0
T14=Y3U1
T15=Y3U2
T16=Y3U3

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