

Response Of Onion Yield On Different Irrigation System Of Various Onion Cultivars Under Uplands Of Balochistan.

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Abstract: The trial was conducted at Directorate of Vegetable seed Production ARI Sariab Quetta-Pakistan. The trial was executed for investigating the efficiency of drip irrigation system on Onion. Experiment have two (2) factors, prime factor was Irrigations systems and second was onion varieties. Irrigation system was comprised on Drip, Furrow and Flood irrigation system. In regard of varieties, 15 cultivars were tested during trial. In study it was revealed that on drip irrigation system, Onion performed well in term of yield. Also the conservation of irrigational water was observed on large scale. 55% irrigational water was conserved through drip irrigation system. The yield on drip was also recorded satisfactory i.e. 51.93 (Chiltan Variety) tons per hectare. At ingenious level the water requirement of onion crop has been recorded almost 40 irrigation. Such water requirement is enormous in current scenario. This study has directly falsify these statement and encourage the utilization of drip irrigation system overall in country.

Key words (Drip Irrigation system, Onion crop, Water Requirement)

1. Introduction

Onion is cash crop of Balochistan, which is being produced on an area of 27294 hectares with a production 515486 tones and it is almost equal to 40 % of our national production of onion (Government of Balochistan 2014-15) (3). Balochistan has five ecological zone and uplands zone is much deprived in irrigation water, where irrigation water is going to be mined from the depth of 400 to 800 feet and irrigating onion crop through flood irrigation system, which is not only wastage of irrigation water, but against the irrigation requiring habit of onion. Onion is sensitive toward saline conditions which is also revealed by Ikram-ul-Haq et al (2015) (6) in his study that onion germinate poor on saline conditions. It is also mentioned that the onion crop is going to be managed through drip system in many advance countries with the result of high yield Sammis, T.W. (1980) (1) reported that, the irrigation water could be preserved through drip irrigation system up to 90%, and subsurface soil irrigation also improve the soil moisture and penetrate water in direction of root zone, and labor cast categorically decreased more than 70%, and reduction of weed was assessed up to 70% and increased in yield become obsessed up to 76.6 %. Drip irrigation system enhance the stability of water efficiency and reduce the loss of water. Ishfaq, (2002) (8) also found in his study that drip irrigations system create stability and improve the irrigation water in crop. Another carried out by A.N. Bagali et al (2011) (5) revealed that scheduling of drip irrigation on short intervals increases the vegetative

growth of onion crop. Drip irrigation system has also efficient in term of fertigation. G.B Yadav et al (2010) (7) alleged in his study that drip irrigation along with fertigation enhance the bulb yield as compare to conventional irrigation systems. Fifteen (15) germplasm of onion crop were collected from Entire County to examine the potential of various irrigation systems on gross yield. Meanwhile the examination of water utilization was also observed on these germplasm. NARC I & II were collected from NARC Islamabad, Phulkara and Lucky were from Punjab, Red Tarnab, Sawat, Trich Mir, Yaqoot, Hybrid Rota were from KPK, Nassarpuri from Sindh, Chiltan-89 and Sariab Red were from Balochistan. These are cultivars were tested simultaneously on Flood, Ridge and Drip irrigation system. Almost 711000 liters were irrigated in entire experiment. On flood irrigation system 316000 liters, ridge irrigation system 251000 liters and in drip irrigation system 144000 liters were utilized. Evaluate the performance of Various Irrigations systems on yield components is the main objective of this study. Therefore, keeping in view the issue of irrigation water shortage in the uplands of Balochistan, the present study was carried out at vegetable seed farm ARI Quetta during the year 2014 and 2015.

2. Material and Methodology

This trial was executed at Directorate of Vegetable Seed Production-ARI Sariab Quetta. Trial was designed on Split Plot (Bi-factorial). Irrigation (I) methods was

considered as prim factor which were casted on various onion varieties. Varieties (V) were the Second factor. Seeds of varieties were collected by Directorate of Vegetable Seed Production. Seeds were raised through nursery which were grown during November 2013-14. Nursery was matured and transplanted in the month of March 2014. Line sowing was directed to transplanting the onion seedlings. The plot size of experiment was 465 m². Plant to plant distances was 10 cm and row to row distance was 30 cm. 15 rows were placed in each sub plot. Application of Fertilizers were uniformly applied on each irrigation system. All agronomic practices were same on each irrigation system. Onion bulbs were manually harvested during the month of September 2014-15. When the necks of onion bulbs were become dry and lay down on the surface it was the sign of maturity. The data was recorded on prior data templates. Data was statistically analysis on Statistix 8.1 (Software).

3. Result and Discussion

The results of irrigations systems were significant at level $\leq (0.05)$. The highest yield was annealed at drip irrigation system i.e. (33.85 tons per ha⁻¹) followed by furrow irrigation system i.e. (31.27 tons per ha⁻¹) and flood become the least producing system in term yield i.e. (30.17 tons per ha⁻¹) . The unconventional irrigation application enhance the bio mass of agronomic plants which is mentioned in table T-IISOV and in production chart (T-PCM). Similar results were observed by K Jha et al (2016) (4). Chiltan-89 yielded 51.93 tons/ha, Trich Mir produced 42.84 tons/ha and Phulkara attain 40.78 tons/hect. Phulkara was the third runner up in yield marathon. While rest of other varieties/cultivars UNS

Gulnar , Sawat Nassarpuri, Hybird rota, Ramata Gulnar, Red Taranab,Sairab Surkh, Red AM ,Yaqoot, NARC-I, Lucky, NARC-II and possessed 37.15, 35.19, 33.88, 32.59, 27.82, 27.61, 27.09, 26.56, 24.99, 24.85, 22.42 and 20.73 tons/ha respectively. The variation of yield in onion cultivars were also seemed (Jilani & Ghafoor, 2003) (2). Overall results were highly significant at 0.05 LSD levels. The results of interaction between irrigation systems and varieties were significant at level 0.05. The drip system was performed with the variety nine Chiltan (62.30 A). The interaction of drip become significant with Trich i.e. (51.33 B). The difference of Drip and furrow irrigations systems were significant but the impact of water saving in drip system was enormous. In furrow the interaction of productive i.e. Chiltan (50.3 B). The onion bulb has proper interaction with appropriate irrigation, because onion bulb required significant irrigation during formation. The same study was unfolded by F.Martin et al (2004) (8) where she fined that bulbification stage have direct interaction with irrigation. The statistics told us that, on drip irrigation system as compare to flood and ridge water was conserve up to 55%, and if it was comparison between ridge and flood irrigation system the conservation rate was seemed up to 31% in ridges. Flood irrigation system having no any conservatory approach. In table T-WC and pie chart explained the conservation of irrigation in various patterns. This experiment reveled that, (through statistics) Drip irrigation system was not only boon for water conservation but along with conservation the yield was also emphatically improved. This experiment reveled the ardent recommendations for adopting the drip irrigation system for the upland farming communities of Balochistan (Pakistan).

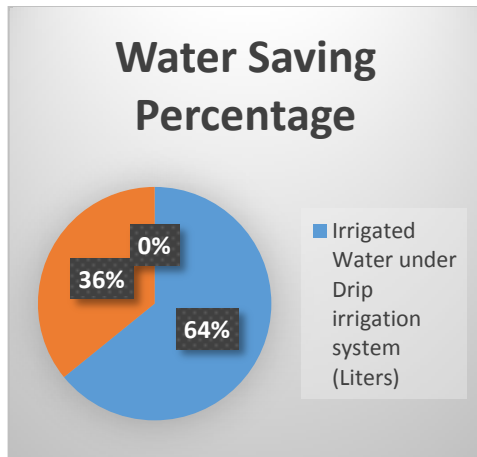
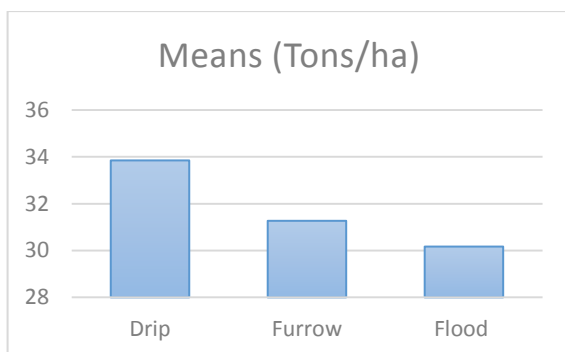
Tab- Influence of Irrigation System on Onion Varieties. (T-IISOV)

| Sr. No | Varieties | Drip | Furrow | Flood | Mean |
|--------|---------------|-----------|-----------|-----------|----------|
| 1 | NARC I | 24.81 ST | 22.1 V | 27.65 QR | 24.85 J |
| 2 | NARC II | 17.89 W | 18.43 W | 25.87 RS | 20.73 L |
| 3 | Phulkara | 40.05 EF | 45.77 C | 36.52 IJK | 40.78 C |
| 4 | Red Tarnab | 29.30 OPQ | 24.9 ST | 28.61 PQ | 27.61 H |
| 5 | Ramata Gulnar | 29.82 OP | 25.03 ST | 28.60 PQ | 27.82 H |
| 6 | UNS Gulnar | 39.58 FG | 38.11 GHI | 33.77 LM | 37.15 D |
| 7 | Red AM | 23.95 TU | 26.3 RS | 29.42 OPQ | 26.56 I |
| 8 | Lucky | 19.41 W | 22.53 UV | 25.30 ST | 22.42 K |
| 9 | Chiltan | 62.30 A | 50.3 B | 43.18 D | 51.93 A |
| 10 | Sawat | 38.97 FGH | 35.73 JK | 30.87 NO | 35.19 E |
| 11 | Trich Mir | 51.33 B | 41.67 DE | 35.53 JKL | 42.84 B |
| 12 | Nassarpuri | 39.45 FG | 32.57 MN | 29.63 OP | 33.88 F |
| 13 | Yaqoot | 23.00 UV | 25.43 ST | 26.55 RS | 24.99 J |
| 14 | Hybrid Rota | 37.25 HIJ | 34.83 KL | 25.68 ST | 32.59 G |
| 15 | Sariab Surkh | 30.66 O | 25.27 ST | 25.34 ST | 27.09 HI |
| | Mean | 33.85 A | 31.27 B | 30.17 C | |

SE # Irrigation system 0.1156 Varieties 0.5209 Interaction 0.9022
LSD (0.05) Irrigation system 0.3211 Varieties 1.0359 Interaction 1.7942

a- Water Conservation Table: (T-WC)

| Crop | Irrigated Water under Drip irrigation system (Liters) | Irrigated Water under Furrow (Liters) | Irrigated Water under Flood (Liters) |
|-------------------------|---|---------------------------------------|--------------------------------------|
| Onion | 144000 | 251000 | 316000 |
| Water Saving Percentage | 55.5% | 31% | 0% |

b- Pie Chart for Water Conservation of various irrigation methods.

Production Chart (Means) (T-PCM)

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Author Profile


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