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STORAGE LOSSES OF ONION BULBS

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ABSTRACT

Field experiments were undertaken in Padra, Rewa to study the storage losses of onion due to sprouting, rotting, rooting and moisture losses in the storage. The treatments consisted 3 levels of N(50,100 and 150 kg N/ha) in the main plot, 5 levels of MH (0,2000, 2,500, 3000 and 3500 ppm) in subplot and 3 timings of spray (7, 14 and 21 days before harvest) in sub-sub plots with four replications during 1980-81 and 1981-82. After harvesting, onion bulbs were kept in bamboo baskets for five months i.e. from June to October, in ordinary room conditions during both years. The studies indicated that the application of 100 kg N/ha along with foliar spray of Maleic hydrazide at 3000 to 3500 ppm concentration at 21 days before harvest proved beneficial for onion production and reducing storage losses of onion bulbs in ordinary storage conditions.

Storage of onion bulbs is a problem due to sprouting, rotting, rooting and mositure losses in the storage. After harvest, good quality onion bulbs should be kept in storage. Chemicals have also been used to minimise the storage losses.

MATERIALS AND METHODS

Field experiments were undertaken in Padra, Rewa (M.P.) at 24^0 31 'N latitude and 81° 15' E longitude and 240 m above MSL. The treatments consisted of 3 levels of N(50,100, 150kg N/ha) in main plot, 5 levels of maleic hydrazide concentration (0,2000, 2500, 3000 and 3500 ppm) in sub plot and 3 times of spray of maleic hydrazide (7,14 and 21 days before harvest) in sub-sub plot, with four replications. The transplanting was done on 17.12.80 and 20.12.81 and harvested on 7.5.81 and 11.5.82. After harvesting, 5 kg random sample od onion bulb were undertaken from each treatment replication wise and kept in the storage in ordinary room conditions in bamboo baskets for five months i.e. from June to October in both years. Periodical

Table 1. Effect of nitrogen, MH concentrations and times of spray of MH on the storage losses of onion bulbs.

Treatment	Sprouting losses		Rotting losses		Rooting losses	
	Weight of sprouted bulbs (kg)		Weight of rotted bulbs (kg)		Weight of rooted bulb (kg)	
	1980-81	1981-82	1980-81	1981-82	1980-81	1981-82
Nitrogen levels (kg/ha)						
50	0.914	0.902	0.75	0.74	0.24	0.24
100	1.181	1.66	0.91	0.89	0.36	0.33
150	1.332	1.316	1.006	0.97	0.46	0.41
SEm ±	0.0013	0.014	0.0006	0.0006	0.0005	0.0004
CD at 5%	0.003	0.033	0.001	0.001	0.001	0.0009
Concentration of MH (ppm)						
0	1.226	1.222	0.94	0.93	0.40	0.40
2000	1.153	1.148	0.90	0.89	0.36	09.35
2500	1.124	1.116	0.88	0.87	0.35	0.33
3000	1.107	1.095	0.87	0.83	0.33	0.29
3500	1.102	1.063	0.86	0.82	0.32	0.27
SEm ±	0.0009	0.01	0.0003	0.0005	0.0003	0.0004
CD at 5%	0 002	0.03	0.0007	0.001	0.0007	0.0008
Time of spray of MH						
7 days before harvesting	1.159	1.149	0.90	0.88	0.36	0.34
14 days before harvesting	1.138	1.117	0.89	0.86	0.35	0.32
21 days before harvesting	1.131	1.119	0.88	0.86	0.35	0.32
SEm ±	0.001	0.01	0.0002	0.0003	0.0002	0.0003
CD at 5%	0.003	0.02	0.0004	0.0006	0.0004	0.0006

Table 2. Effect of nitrogen, MH concentrations and times of spray of MH on the storage losses of onion bulbs.

Treatment	Moisture weight loss of bulb (kg)		Total loss in weight of bulb (kg)	
	1980-81	1981-82	1980-81	1981-82
Nitrogen levels (kg/ha)				
50	0.25	0.25	2.17	2.14
100	0.35	0.34	2.77	2.73
150	0.60	0.60	3.36	3.26
SEm ±	0.0008	0.0009	0.02	0.002
CD at 5%	0.002	0.002	0.06	0.006
Concentration of MH (ppm)				
0	0.39	0.39	2.97	2.95
2000	0.39	0.39	2.76	2.79
2500	0.40	0.39	2.73	2.71
3000	0.40	0.40	2.69	2.54
3500	0.40	0.40	2.70	2.55
SEm ±	0.0004	0.0006	0.03	0.004
CD at 5%	0.0009	0.001	0.06	0.009
Time of spray of MH				
7 days before harvesting	0.40	0.40	2.83	2.78
14 days before harvesting	0.40	0.40	2.75	2.68
21 days before harvesting	0.40	0.39	2.73	2.66
SEm ±	0.0002	0.002	0.02	0.006
CD at 5%	NS	NS	0.05	0.01

data were recorded on sprouting, rotting, rooting, moisture losses, and total loss in weight of bulb for statistical analysis.

RESULTS AND DISCUSSION

Effect of nitrogen

Increasing levels of N increased the sprouting loss, rotting loss, rooting loss, moisture loss and total loss in weight of bulbs (Table 1). Although sprouting was not observed at 30 days of storage (initial stage) but these losses increased with the advancement of storage period from 60 days to 150 days of storage. The increased losses may be due to the fact N increases the succulency and moisture content in the bulb, higher the moisture succulency and moisture content, greater are the losses. Increased levels of N also increased the metabolic activity with in the bulb utilizing moisture in the process. Moreover, nitorgen favours the apical dominance and enhance the formation of auxins which in turn promotes the growth and development of dormant buds by activating and enlarging the cells. Thus in general increasing levels of N increased the losses in storage.

Effect of concentration of MH

Increasing levels of MH concentration significantly reduced the sprouting loss, rotting loss, rooting loss, moisture loss and total loss in weight of bulb during both years in the storage (Table 2). It may be attributed to the beneficial effect of MH, which is antiauxin and removes apical dominance in plant and destroys the auxins. It is also mitotic inhibitor and acts as a chromosome breaking agent and growth supressor. It also reduces the moisture content in the bulb and respiration and inhibits the root formation. The chemical also causes the death of root tips and inhibits the development of lateral roots.

Increasing concentration of MH reduced the total loss in weight of bulbs which may be due to the beneficial effect of MH, which reduced the sprouting, rooting and rotting losses, The results are also in conformity with other findings (Acosta and York, 1957; Randhawa and Nandpuri, 1969).

Time of application of MH

Increasing the time of spray of MH, before harvest significantly reduced the sprouting losses.

rooting losses, rotting losses and total loss in weight of bulb, but did not influence the moisture content in the bulb during storage. It may be due to the fact that increasing interval of spraying of MH is directly associated with the absorption and utilization of MH sprayed over the foliage. More the quantity of absorbed MH more would be the effect, since the absorption is higher in green foliage as compared to dry foliage and therefore, there was more effect of MH when interval of spraying before harvest was more. The application of MH before harvest reduced the loss, maximum, when spray was done 21 days before harvest followed by 14 and 7 days, consequently reduction of sprouting, rooting and rotting losses. With the advance of storage period the total loss increased. This may be due to the fact that all total loss which included sprouting loss, rotting loss, rooting loss and moisture loss increased and hence resulted in total loss.

REFERENCES

ACOSTA, J.C. and YORK, T.A. 1957. Control of sprouting in onion bulbs with maleic hydrazide. **Phillipine Agric., 40**:525-537.

RANDHAWA,K.S. and NANDPURI,K.S. 1969. Influence of certain plant growth regulators on rooting and rotting behaviour of onion under ordinary storage conditions.**J.Res.,6**:760-763.

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EFFICIENCY OF NITROGEN SOURCES IN WET LAND RICE SOIL DURING DIFFERENT CROP SEASONS

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ABSTRACT

Three field experiments were conducted during summer (February-May), *kuruvai* (July-October) and *thaladi* (November- February) seasons of 1985-'86 with different sources of N,viz., prilled urea, ammonium chloride, neem cake coated urea, coal tar coated urea, lac coated urea and urea supergranule, each with four levels, viz., 0, 51, 102 and 153 kgN/ha to study the use efficiency (NUE) and apparent recovery (ANR) of the applied N in wet land rice. The results indicated that the yield, uptake of N, the NUE and ANR in rice were higher under urea supergranule followed by lac coated urea than prilled urea in all the three crop seasons. Application of ammonium chloride also registered higher grain yield and NUE over prilled urea during *thaladi* season.

Due to cost escalation of N fertilizers, there is always a compelling need to evolve sutiable fertilizer N management strategies in order to reduce the losses of applied N and to increase the N use efficiency. With a view to evaluate the efficiency of different N fertilizers and their effect on the yield and uptake of nutrients in rice in different growing seasons, the present investigation was carried out. The results are presented in this paper.

MATERIALS AND METHODS

Three field experiments were conducted in Tamil Nadu Rice Research Institute, Aduthurai during summer (Feburary-May), *kuruvai* (July-October) and *thaladi* (November-February) seasons of 1985'86, to study the influence of different sources and levels of applied N on the yield and uptake of nutrients by rice and to work out the efficiency of the applied N during the different crop seasons. The soil of the experimental field was a deep grey brown river alluvium with clay loam texture and belonged to Adanur series (Entic Chromustert). The soil was non calcareous, neutral in reaction, low in available N (270 kg KMno4-N per ha), medium in available P (16.2 kg Olsen-P per ha) and high in available K (286 kg NH_4OAc-K per ha) with an organic carbon content of 0.81 per cent and CEC of 26.4 C mol (P*) /kg.

The treatments included four levels of N, *viz.*, 0, 51, 102 and 153 kg/ha and six sources of N, *viz.*, prilled urea (PU), ammonium chloride (AC), neem cake coated urea (NCA), coal tar coated urea (CTU), lac coated urea (LUC) and urea supergranule (USG). There were 24 treatment combinations replicated twice in a factorial randomized block design. In all the treatments except USG, nitrogen was applied by broadcast in three splits *viz.*, 50 per cent basal, 25 per cent at