Effect of nitrogen fertilization level and postharvest treatments on storageability of equash fruits

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This work was carried out during 1992 and 1993 summer seasons at the Experimental Farm of the Faculty of Agriculture, Moshtohor Zagazig University to study the effect of nitrogen fertilization level on vegetative growth, fruit yield and quality of squash plants cv. Eskandarani. Furthermore, storage studies were performed to elucidate the effect of N-fertilizer level and some post-harvest treatments on the storageability of squash fruits. Thus, this study can be divided into two parts: The fieldexperiments and the storage ones. 1-- The field experiments:Two field experiments were carried out to investigate the effect of nitrogen fertilization at the rate of 0,20, 40,60 and 80 kg/fed. Nitrogen fertilizer was divided into two equal portions and added 3 and 6 weeks after seed sowing, to study its effect on vegetative growth and chemical composition of plants as well as fruit characters, yield and its components. The obtained results could be summarized as follows:1-The vegetative growth of squash plants expressed as plant height, number of leaves, fresh and dry weight per plant were significantly increased as the nitrogen fertilizer level increased, whereby the highest values of such trials were observed with the highest used N-level (80kg/fed.).2-Leaves content of photosynthetic pigments, i.e. chlorophyll ”a” and ”h”, N,P and K as well reducing and non-reducing sugars, were significantly and progressively increased as nitrogen fertilizer level increased up to80 kg/fed. 3-Number and weight of fruits per plant as well as early and total yield per feddan of squash plants were significantly increased as the nitrogen fertilizer increased up to the fourth used level, i.e. 60 kg/fed., without great differences between it and those of 40 kg/fed. Further increase up to 80 g N/fed. showed drastical decrement in this respect.4-Average weight, length and diameter of fruits were significantly increased by application of any used level of N-fertilizer compared with the control. However, no significant differences could be detectedwhen N was applied at 20 up to 80 kg/fed.5-Accumulation of minerals (N,P,K and Ca.) as well as reducing and non-reducing sugars in squash fruits were significantly and constantly increased as the nitrogen fertilizer level increased up to 80 kg/fed.It can be generally concluded that adding 40 or 60 kg N/fed. divided into two equal portions 3 and 6 weeks after seed sowing proved to be adequate and can meet the requirements of squash plants to get moderate and well developed growth with best flowering and fruiting characteristics. II- The storage experiments:Two experiments were carried out during the summer seasons of 1992 and 1993 at the laboratory of Horticultural Dep. Fac. of Agric. Moshtohor, Zagazig University to study the effect of N-fertilization level (0,20,40,60 and 80 kg/fed.), post harvest fruits treatments with chemical materials [vapor gard 2%, Ca C12 6%, vapor gard 2% + Ca C12 6% and control (without chemicals)] under two different storage conditions (room storage 33 ± 2°C, 65-75% R.H. and cold storage 10 ± 0.5°C, 90-95% R.H.) on storageability of squash fruits cv. Eskandarani. Squash fruits were packed in perforated carton boxes of 2 kg capacity. During storage period, fruit samples were taken from each treatment to determine the physical and chemical properties at 4 days intervals to investigate the storageability of squash fruits during storage period. Obtained results canbe summarized as follows:1- Increasing nitrogen fertilization level led to a progressive significant increase in fruits weight loss% during storage, at both normal room and cold one. Dipping fruits before storage in used chemical materials lessened the weight loss percentages with the

superiority of vapor gard 2% followed by Ca C12 6%. Percentages of weight loss were increased at more rapid rate when fruits were stored in normal room than in cold one. Fruits lost about 12.73% (as average of both seasons) when stored for 8 days under normal room conditions but it lost only 12.62% after20 days under cold conditions.2- Increasing nitrogen fertilization level led to a significant and gradual increase of fruits decay percentages during storage at both normal room and cold storage conditions. Fruits treated with either 2% vapor gard, 6% Ca C12, vapor gard + Ca C12 or those untreated when stored under normal room conditions for 8 days decayed for about 18.1, 23.2, 25.4 or 39.4% (as average of both seasons), respectively. Meanwhile, the paralleled values of fruits stored under cold conditions for 20 days were obviously lower and reached 13.4, 15.9, 16.2, or 20.8%,respectively. Prolongation of storage period led to a progressive significant increase in decay %, whereby the highest values were obtained after 8 days and 20 days of storage at normal room and cold one, respectively.3- Increasing nitrogen fertilization level had a significant and gradual decrease of fniits dry matter %, whereby the highest values were pronounced in fruits produced from plants did not receive N-fertilizer. Application of chemical materials had significantly decreased the dry matter % of squash fruits during storage. The reduction of fruits dry matter% was higher in fruits stored at normal room than those stored at cold one. Although fruits dry matter% was slightly increased at the beginning of storage period followed by decline in last periods at cold storage, it was gradually decreased throughout the storage period underroom conditions.4-Squash fruits obtained from plants did not receive N-fertilizer maintained the highest percent of T.S.S. during storage, whereas, fruits of plants supplemented with the highest N-level (80 kg/fed.) exhibited the lowest values in this respect. Application of chemical materials was significantly effective on fruits T.S.S.%. Squash fruits treated with vapor gard 2% exhibited the highest percent of fruits T.S.S. during storage. The loss in T.S.S% was higher in fruits stored at normal room compared with those stored at cold one. Fruits T.S.S.% increased initially then decreased till the end of storage periods at both normal room and cold one.5-Increasing nitrogen fertilization level led to a significant progressive increase in reducing, non-reducing and total sugars% of squash fruits during storage. Post harvest treatment with chemical materials resulted in a significant increase in all sugar fractions compared with untreated control during storage. The highest values were recorded by fruits treated with 2% vapor gard, followed by those treated with 6% Ca C12 either alone or in combination with vapor gard. Sugars content was clearly reduced in fruits stored at normal room compared with those stored at cold storage. Under room conditions, both sugar fractions remained somewhat constant up to 4 days then after, the reducing sugar increased meanwhile, non-reducing one drastically decreased up to 8 days. Under cold room conditions both sugar fractions were constantly increased reaching its peak after 8 or 12 days for non-reducing and reducing sugar, respectively before it anew decreased towards the endof storage time (20 days).6- Increasing nitrogen fertilization level led to a significant and progressive increase of fruits N,P,K and Ca during storage. Application of studiedchemical materials significantly decreased fruits content of N but did not induce significant influence on both P and K %, meanwhile dippingfruits in 6% $CaCl_2$ solution prior storage significantly enhanced Ca-accumulation in treated fruits compared with other used treatments. Squash fruits stored at cold room maintained higher percentages of N,P,K and Ca compared with those stored at normal room conditions. Prolonging storage period under both normal and cold conditions resulted in a slight progressive increase in N,P,K and Ca content ofstored squash fruits.from the previousl discussion, it is advisable to store squash fruitsobtained from plants received not more than 40 kg. N/fed. under cold storage (10 ± 0.5 °C and 90-95% R.H.) with treating fruits before storage with vapor gard 2% or Ca C12 6% or their mixture in the sameconcentrations for 20 days in good condition.