SOME FACTORS AFFECTING THE YIELD AND SEED QUALITY OF PEPPER PLANT

BY

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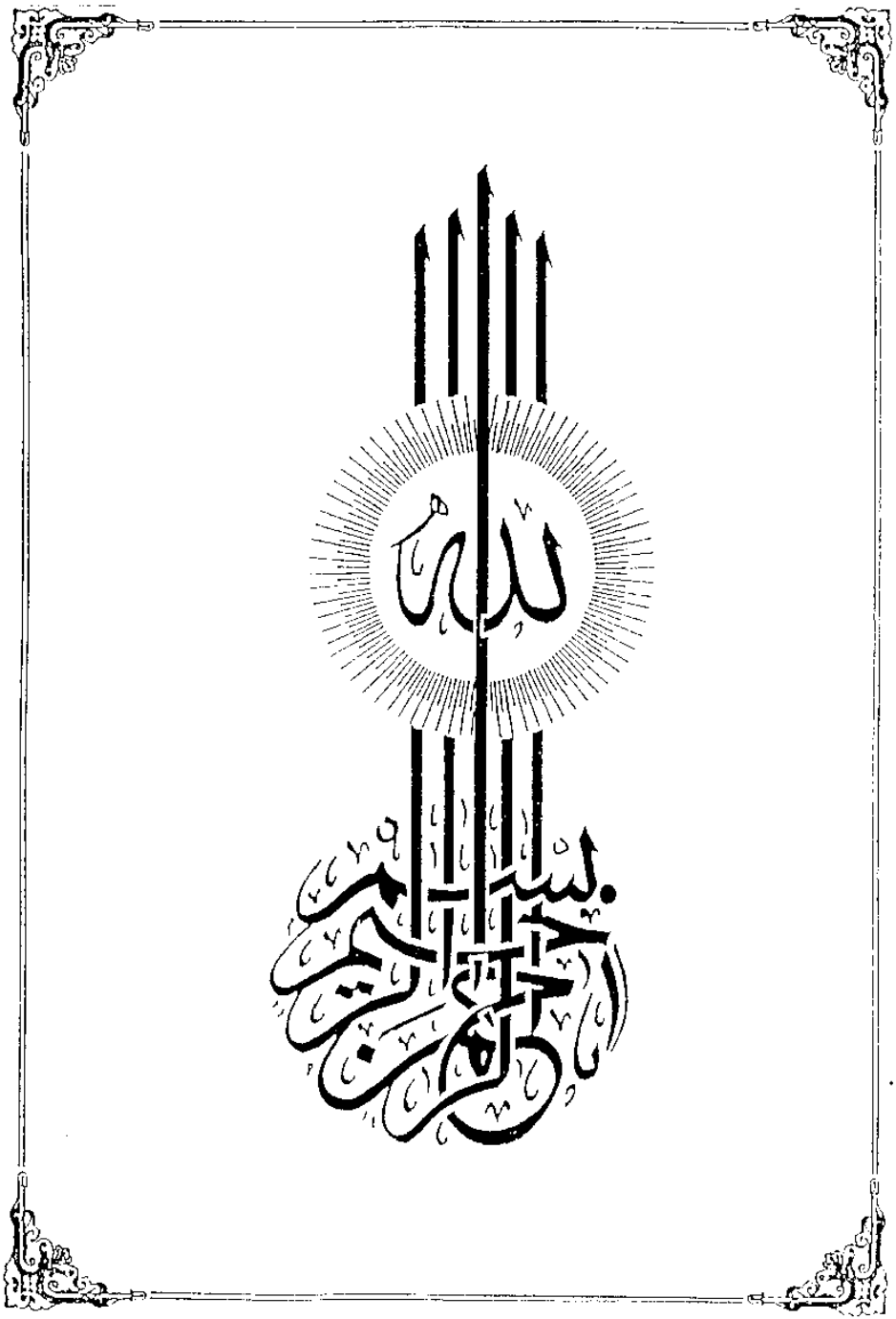

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TO MY HUSBAND, DAUGHTER,

AND SON

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ARABIC SUMMARY

Introduction

INTRODUCTION

There are several factors which have marked effects on the productivity of vegetable crops. One of the most important factors is quality seeds. High quality seed should be taken into consideration when high yields of fresh vegetables are required. The developed countries have already realized the importance of the high quality seed, so that, they pay a considerable attention to seed industry. The developing countries still depend to a great extent on the developed countries in obtaining the seeds for cultivation of most vegetable crops. The weather conditions in Egypt including temperature and long dry season should help this country to be one of the main producers of vegetable seeds. The present work has dealt with seed production industry of sweet pepper (Capsicum annuum, L.). Sweet pepper is one of the important vegetables in Egypt for both local consumption and export. The amount of pepper seeds imported yearly reached 1.581 tons. The area cultivated with pepper in 1985 mounted 27,947 feddans. This area produced 191,768 tons of green pepper with an average yield of 6.86 tons per feddan*. This low yield reflects the need for more effort and more attention to be paid for the increment of yield and quality of

* Source: Dept. Agr. Econ., Min. Agr. 1985.

pepper produced in Egypt.

The purpose of this investigation was to establish a better understanding of the relationship between planting date, storage conditions, seed yield, seed viability and endogenous plant growth substances. The effect of fruit position and picking frequency on seed yield and qulaity of pepper were also studied.

Review of Literature

REVIEW OF LITERATURE

Effect of planting date on the vegetative growth, yield and seed quality of pepper plant.

Different planting dates are usually accompanied by differences in the prevailing temperature, humidity, light intensity and day length. These factors have normally a clear effect on plant growth and yield of many vegetable crops. Accordingly, planting dates and their effects on vegetative growth and yield were the subject of many investigations.

1. Vegetative growth

The influence of environmental conditions on the vegetative growth of many vegetable crops has been studied comprehensively. Oleinikova (1951) mentioned that pepper usually require high temperature, particularly in the early days of growth. Thompson and Kelly (1957) pointed out that pepper plants held at 50 to 60°F, for about 6 months made no appreciable growth. Somos (1958) indicated that sowing period for most vigorous growth of tomatoes was May, and for the slowest growth was autumn. Gowda (1981) observed that the plant height and branching of pepper were greater after August than after October sowings. Artjrigina (1965) likewise, stated that pepper plants

sown late in May developed more rapidly than did those sown early in April. Filius (1967) indicated that changing in temperature affected the vegetative growth of green pepper. He added that the optimum day temperature proved to be 25°C, and below it the lower the day temperature adverse was the effect of a lower night temperature. Rylski (1972) indicated that growth rate of pepper increased as soil temperature rose, and total plant weight after 100 days of growth at various soil temperatureswas greater with rising temperature. The top continued to develop with higher temperature.

2. Flowering and Fruit set.

Cochran (1936) studied the effect of temperature on anthesis in pepper and reported that anthesis occurred 43 days after the seed had been sown when the plants were grown under 90°-100°F range of temperature. At 70°-80°F, anthesis started after 50 to 57 days. When the temperature was 60°-70°F, anthesis occurred after 61-72 days, and 103 days when the temperature range was 50°-60°F. The time from anthesis to fruit maturity was also found to be 20 days shorter when the prevailing temperature was 70°-80°F than when it was 60°-70°F. Hamadeh (1967) indicated that low fruit set, caused by post anthesis abscission of flowers and young fruits

in the pepper varieties Vinedale Pennwonder and keystone Resistant, was linked with unfavourable warm temperature during June, July, and early August. He stated also that temperature requirements for optimum fruiting comprised a sequence of warm (70°-80°F) temperature, prevailing during the pre-anthesis stages followed by Cool (50°-60°F) to medium (60°-70°F) temperature during the post anthesis stages. He added that cool temperature alone did not permit flowering, while medium temperature was moderately favourable for fruiting, and warm temperature impaired the reproductive process. The response of two pepper varieties, Delaware Belle and Pennwonder, subjected to 4 different night temperatures (50°, 60°, 70° and 80°F), while the day temperature was maintained at 78°F, was investigated by Wells (1967). He found that greater number of flowers per plant was obtained at night temperatures of 60° and 70°F, whereas the greatest number of fruits and highest percentage of fruit set existed at 50° and 60°F. Both flowering and fruiting were found to be cyclic in habit. At 60°F night temperature there was one cycle of flowering and one cycle of fruiting. At 50°, 70° and 80°F there was also one flowering cycle, while two fruiting cycles were evident with the flowering peak occurring midway between the two fruiting peaks.

Rylski and Halevy (1974) on (Capsicum annuum L.) showed that night temperature prevailing before anthesis was not significant for parthenocarpic fruit development, but a low temperature after anthesis did enable such fruit to develop. High temperature (18°-20°C) during flower development was necessary for the formation of well-shaped elongated fruit. They reported also that the highest length/diameter ratio in both fertilized and non-fertilized fruit was obtained with a high temperature (18-20°C) up to anthesis and low (8-10°C) thereafter.

3. Fruit yield

Masuda and Hayashi (1959) studied the effect of seeding time on the date of flowering and harvesting of mature fruit, and total yield of red pepper at Okayama, Japan. The result showed that there were three flowering cycles, the first and the most important of which took place during July-August. They reported that this cycle, alone, was the most important for the production of ripe fruits under the conditions of their experiments.

Dikij (1957) found that planting eggplants and pepper in spring reduced the yield and shortened the harvesting period.