

TO ECONOMIZE DATE PALM POLLENS THROUGH DIFFERENT DILUTING MATERIALS IN ASEEL CV

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ABSTRACT

The current study was conducted on dilution of date pollens by mixing with some carriers i.e. wheat flour and saw dust of cheel (*Pinus roxburghii*) at Horticultural Research Station, Bahawalpur, Pakistan during 2005-06. Seven treatments were applied during pollination season of date palm. Application of 100% pollens (T_1 =control) was compared with other six treatments (T_2 - T_7) consisting of mixtures of the carries with pollens at ratios of 12.5, 25.0 and 50.0%. Fruit set (%), number of fruit spathe⁻¹ and yield plant⁻¹ were significantly affected. Although maximum values were recorded in control, yet mixing of 50% pollens with 50% wheat flour (T_2) or 50% pollens with 50% saw dust (T_5) were similar in effect to that of control (T_1 =100% pollens) for yield plant⁻¹ and it ranked 2nd for fruit set percentage (64-66%) and number of fruit spathe⁻¹. However, fruit size (length x diameter in cm), fruit weight (g), stone weight (g) and fruit TSS (Brix) were not affected statistically.

Key Words: *Phoenix dactylifera* L., pollination, wheat flour, saw dust, fruit setting.

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INTRODUCTION

Date palm (*Phoenix dactylifera* L.) belongs to family Palmaceae is a plant which bears sexes (male and female) on separate plants. Natural pollination by wind, bees and insects is found to yield a fair fruit set in various areas of the date growing countries. However, these regions e.g. Marrakech (Morocco), Elche (Spain), Baja (Mexico) and Ica (Peru) have 100% seedlings population with about 50% males (Zaid and de Wet, 2002). In the absence of such natural pollination, female flowers cannot be fertilized without artificial pollination. After opening, female flowers need to be pollinated within 2 to 4 days (Zaid and de Wet, 2002). Early pollination results in better fruit set.

The old pollination technique is to place an entire male spathe in the crown of the female palm leaving the rest to be wind pollinated. It has been abandoned because of non-availability of large number of male spathes (Zaid and de Wet, 2002). Pollination can also be done either by placing spikelets of male flowers in the freshly opened female spathe or with a hand pollinator (Nasir *et al.*, 1997). There are several techniques to apply dry pollens e.g. dusting on cotton pieces and placing these between the strands of inflorescence, through a puffer or mechanical devices (Zaid and de Wet, 2002). Mechanical pollination was developed by USA and Israel where labour is expensive and not always available. However, mechanical pollination requires 2 or 3 times more pollens than manual pollination. To overcome the problem, date growers are mixing the pollens with adjuvants/fillers i.e. talc, bleach, wheat flour, walnut-hull dust etc. Hamood and Mawlood (1986) found that repeating mechanical pollination 4 times by using 1:10 (pollen/filler ratio) increased the yield of Zahdi cv.

During pollination period (February-March), availability of date pollens in sufficient quantity is a serious concern for date growers. Furthermore, pollination may have to be repeated once or twice after rains during pollination season. This situation necessitates a large quantity of pollens which may not be readily available at that time. Therefore, limited supply of pollens can be economized by mixing the pollens with an appropriate carrier in a proper effective ratio. Khalid and Shawaan (1982) tested pollen efficacy by mixing pollens with wheat flour in various ratios and noted 75% fertilization when pollens were mixed with wheat flour against 61% fertilization when only pure pollens were used. Previously it was reported that mixture consisting of 10-15 % pollen grain and 85-90% bran gave optimum fruit set (Anonymous, 1976). Nasir *et al.* (1997) found that pure pollens (100%) or mixtures of pollens + wheat flour at 30 : 70, 20 : 80, 10 : 90% or spray of 1 teaspoon pollens + 150 ml of tap water, were equally effective for fruit and stone parameters of Hillawi cv. However, maximum yield spathe⁻¹ was noted with 1 tea spoon pollens + 150 ml tap water spray followed by 100% pollen dusting.

The present study was initiated to find out cheaper and compatible pollen filler/adjuvant and to search out the admissible ratio in which the pollens and fillers should be mixed to overcome scarcity of date pollens during pollination period.

MATERIALS AND METHODS

The study was carried out for two years i.e. 2005 and 2006 at Horticultural Research Station, Bahawalpur, Pakistan. Each year the experiment was laid out in Random Complete Block Design (RCBD) and replicated thrice reserving one plant of Aseel cv. for each treatment application. Fresh pollen grains were collected during mid of February from a single male plant; these were dried under partial shade and mixed with filler in ratios according to the following seven treatments.

T₁ = 100 % pollens (control)

T₂ = 50 % pollens : 50 % wheat flour

T₃ = 25 % pollens : 75 % wheat flour

T₄ = 12.5 % pollens : 87.5 % wheat flour

T₅ = 50 % pollens : 50 % saw dust of cheel

T₆ = 25 % pollens : 75 % saw dust of cheel

T₇ = 12.5 % pollens : 87.5 % saw dust of cheel

All the treatment were applied by hand pollinator (pressure pump dusting on open female spathe) during the mid of March each year.

The data were recorded on fruit set percentage after two months of treatment application during mid of May, while data on other parameters i.e., number of fruit spathe⁻¹, fruit size (length and diameter), single fruit weight, stone weight, total soluble solids and yield plant⁻¹ were recorded at fruit maturity during mid of July. The two years data were pooled and analyzed by using Fisher's Analysis of Variance technique. The treatment means were compared by LSD at 5% level of significance (Steel and Torrie, 1984).

RESULTS AND DISCUSSION

Fruit Set (%), Number of Fruit Spathe⁻¹ and Yield Plant⁻¹

Fruit set (%), number of fruit spathe⁻¹ and yield plant⁻¹ were significantly affected by the treatments applied. Although the highest fruit set (74%), maximum number of fruit spathe⁻¹ (839) and maximum yield plant⁻¹ (83 kg) were recorded in the control treatment where 100% pure pollens were dusted, yet mixing of 50% pollens with 50% wheat flour (T₂) or mixing of 50% pollens with 50% saw dust of cheel (T₅) remained reasonable compared to the control Table I. The obtained results of the current study were supported by the previous findings (Anonymous, 1976) as mixture consisting of 10-15 % pollen grains mixed with bran gave optimum fruit set. However, Nasir *et al.* (1997) found that pure pollens (100%) or mixtures of pollens with wheat flour or in tap water, were equally effective regarding fruit set (%) in Hillawi cv. Although maximum values were recorded in control plants treated with 100% pollens, yet mixing of pollens with wheat flour or saw dust at 50:50 remained at par with control plants for yield plant⁻¹ and ranked 2nd for fruit set (%) and number of fruit spathe⁻¹ in the present study. However, reduction in the proportion of pollens below 50% while mixing with fillers (i.e., T₃, T₄, T₆ and T₇) may further decrease significantly the values of these parameters.

Fruit Size (cm), Fruit Weight (g), Stone Weight (g) and TSS (Brix)

Fruit size (cm), fruit weight (g), stone weight (g) and TSS (Brix) were found statistically non-significant (Table I). These results are in accordance with the findings of Nasir *et al.* (1997) who reported that these parameters were not affected significantly by mixture of pollens and wheat flour or pollens water solution.

CONCLUSION AND RECOMMENDATION

It could be inferred from the current study that deficiency of date pollens during pollination period could be made up by mixing the date pollens with wheat flour or cheaper filler i.e. saw dust of cheel at 50:50 without affecting yield plant⁻¹ and other fruit quality parameters obtained under control treatment. In case of pollen scarcity, date pollens should be mixed with wheat flour or saw dust of cheel at 50:50 to get fruit set and fruit quality.

Table I Fruit characteristics and yield plant⁻¹ of Aseel cultivar as affected by date pollens applied through different diluting materials

Treatments	Fruit set (%)	Ave. No. of fruit spathe ⁻¹	Ave. yield plant ⁻¹ (kg)	Ave. fruit size length x dia (cm)	Ave. fruit weight (g)	Ave. stone weight (g)	TSS (Brix)
T₁=100% pollens (control)	74 a	839 a	83 a	3.0 a x 2.1 a	10.6 a	1.16 a	31 a
T₂=50% pollens : 50% wheat flour	66 b	661 b	74 a	3.2 a x 2.2 a	10.8 a	1.13 a	30 a
T₃=25% pollens : 75% wheat flour	56 c	494 c	58 b	3.2 a x 2.2 a	11.4 a	1.12 a	29 a
T₄=12.5% pollens : 87.5% wheat flour	47 d	307 d	38 c	3.2 a x 2.4 a	11.2 a	1.05 a	31 a
T₅=50% pollens : 50% saw dust of cheel	64 b	617 b	71 a	3.3 a x 2.3 a	11.1 a	1.09 a	32 a
T₆=25% pollens : 75% saw dust of cheel	57 c	442 c	51 b	3.4 a x 2.3 a	11.1 a	1.10 a	30 a
T₇=12.5% pollens : 87.5% saw dust of cheel	38 e	309 d	37 c	3.4 a x 2.4 a	11.8 a	1.06 a	30 a

LSD at 5%. Differences among means are indicated by letters

REFERENCES

- Anonymous. 1976. 3rd FAO Technical Conf. on the Improvement of Date Production, Processing and Marketing held in Baghdad by FAO and AOAD. 24p.
- Hamood, H.H. and E.A. Mawlood. 1986. The effect of mechanical pollination on fruit set, yield and fruit characteristics of date palm (*Phoenix dactylifera* L.) Zahdi cultivar. Date Palm J. 5(1): 23-37.
- Khalid, A.R. and A.M. Shawaan. 1982. Wheat flour and sugar solution media as carriers for date palm pollen grains. 1st Symp. On Date Palm. Agric. Res. Centre, Ministry of Agric. and Water, Al-Hasa, Kingdom of Saudi Arabia. 68p.
- Nasir, M.A., I.H. Mian and M. Asghar. 1997. Effect of date pollen mixed with wheat flour and tap water on date yield. J. Agric. Res. 35(1-2): 63-67.
- Steel, R.G.D. and J.H. Torrie. 1984. Principles and Procedures of Statistics: A Biometrical Approach. McGraw Hill Book Int'l. Co., Singapore.
- Zaid, A. and P.F. de Wet. 2002. Pollination and bunch management. In: Zaid, A. (ed). Date Palm Cultivation. FAO Plant Prod. & Prot. Paper 156 Rev.1. pp. 227-269.