SEM STUDY ON THE EFFECT OF COMPLETE FERTILIZER CALCIUM – BORON AND NAA ON PHYSIOLOGY OF FLOWERING FOR POD AND SED SETTING OF THE WHITE KWAO KRUA

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ABSTRACT

The white Kwao Krua (Pueraria candollei Grah. var. mirifica) is an outstanding medicinal plant native to Thailand. Problems in their pod and seed setting cause their seedlings to have a very high cost. Factors affecting the physiology of flowering, emphasizing on minerals and plant growth regulator were studied with a SEM technique. The experiment was conducted during the years 2002-2004 at the Suranaree University of Technology Farm. A factorial experimental design in RCBD with 4 replications was set. The treatments are shown in Table 1. The data were collected at 3 weeks after the last treatment. A SEM technique was used to study the physiology of flowering. Pod and seed settings were also examined. T8 gave a statistically significant difference to the mean, and the highest number of inflorescences per plant, number of pods per inflorescence, number of seeds per pod, and weight per 100 seeds. There are 10 stages of flower development. NAA together with high phosphorus and boron helped flower development. 12-24-12 (N-P-K) 35 kg/rai gave the shortest the number of days to flower. The initiation and the development of flower in the White Kwao Krua had the same pattern as the plants in the sub family Papilionideae, family Leguminosae.

Introduction

The white Kwao Krua (*Pueraria candolli* Grah. var. mirifica) is an outstanding medicinal plant native to Thailand. Problems in their pod and seed setting cause their seedlings to have a very high cost. An investigation of factors affecting the physiology of flowering, pod and seed setting should demonstrate how to solve these problems. Factors affecting the physiology of flowering, emphasizing on minerals and plant growth regulator were studied with a SEM technique.

Materials and Methods

The experiment was conducted during the years 2002-2004 at the Suranaree University of Technology Farm. A factorial experimental design in RCBD (Randomized Complete Block Design) with 4 replications was used to study the system. The treatments are shown in Table 1. The treatments were given at the young fully expanded leaf stage and at the inflorescence primordial induction stage. The data were collected at 3 weeks after the last treatment. A SEM technique [1] was used to study the physiology of flowering, leading to determination of the quantity and quality of pod and seed settings.

Results and Discussion

T8 gave a statistically significant difference to the mean, and the highest number of inflorescences per plant [Figure 1], number of pods per inflorescence [Figure 2], number of seeds per pod [Figure 3], and

weight per 100 seeds [Figure 4]. There are 10 stages of flower development [Figure 5-14]. Table 1. shows the number of days for primordia to change by each treatment. NAA promoted flower bud initiation. NAA together with high P and boron helped flower development [2,3]. The initiation and the development of flower in the White Kwao Krua had the same pattern as the plants in the sub family Papilionideae, family Leguminosae [4].

Table 1. The factorial in RCBD experimental design and the number of days to flower of each treatment counted from the first treated.

Treatment	Material	The number of days to flower
T1	control (not treated)	235.75 c[1]
T2	12-24-12 (N-P-K) 35 kg/rai*	226.75 a
T3	10 ppm calcium-boron (CaB)	238.25 d
T4	12-24-12 (N-P-K) 35 kg/rai*+10 ppm CaB	234.50 c
T5	100 ppm NAA	231.00 b
T6	12-24-12 (N-P-K) 35 kg/rai*+100 ppm NAA	231.00 b
T7	10 ppm CaB+100 ppm NAA	235.00 c
T8	12-24-12 (N-P-K) 35 kg/rai*+10 ppm CaB+ 100 ppm NAA	234.75 c

1 In a column, means followed by a common later are not significantly different at 5% level by DMRT, *6.25 rai = 1 ha

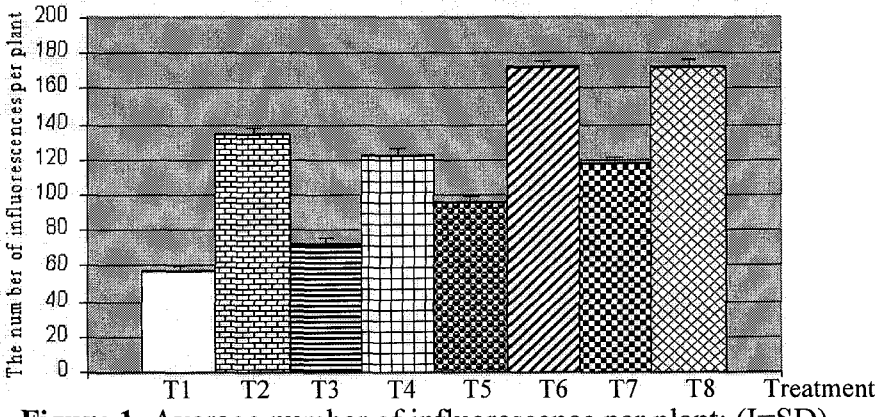


Figure 1. Average number of influorescence per plant; (I=SD)

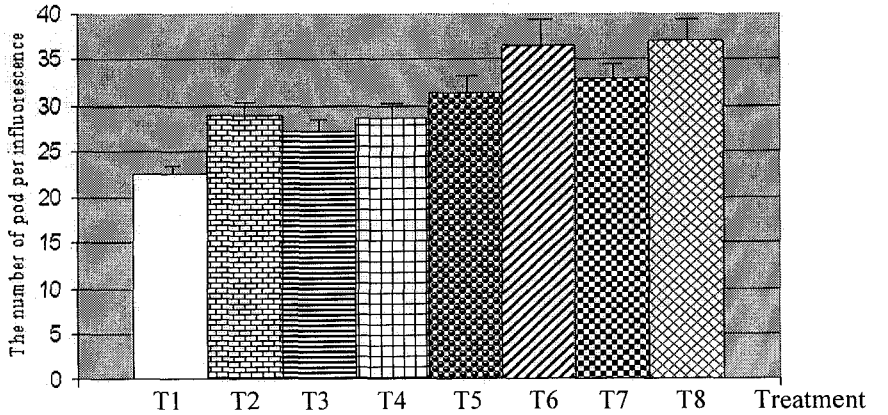
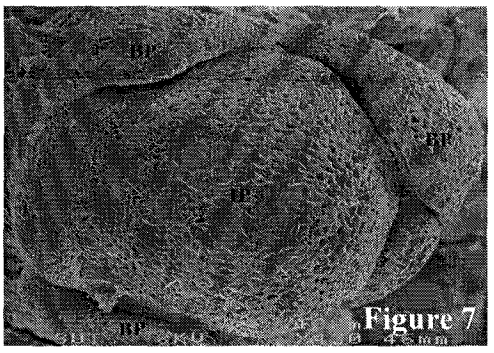
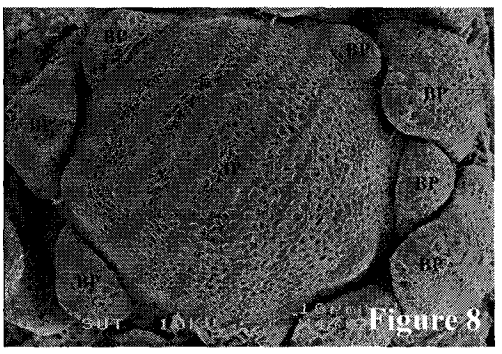
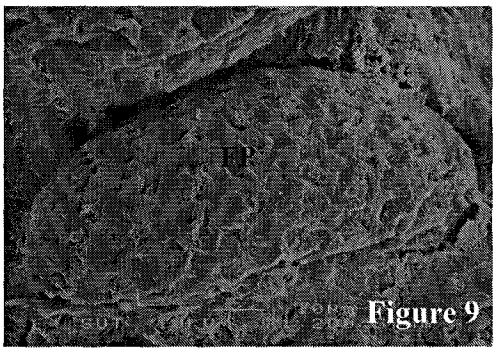
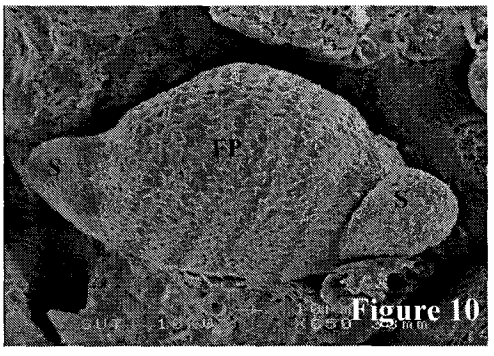


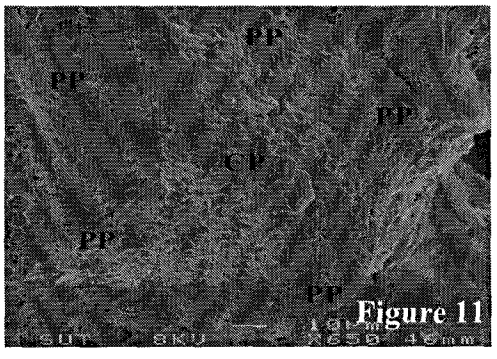
Figure 2. The number of pod per influorescence; (I=SD)

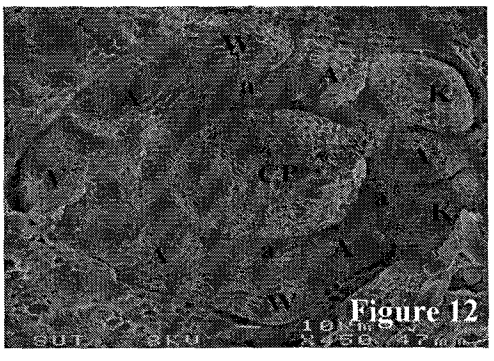


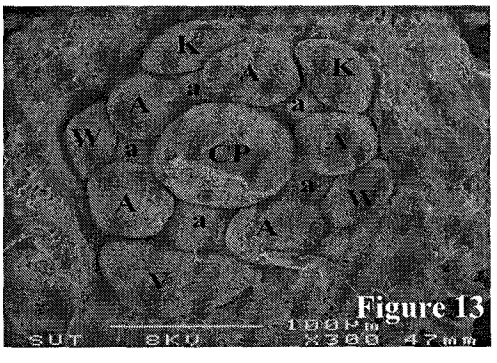












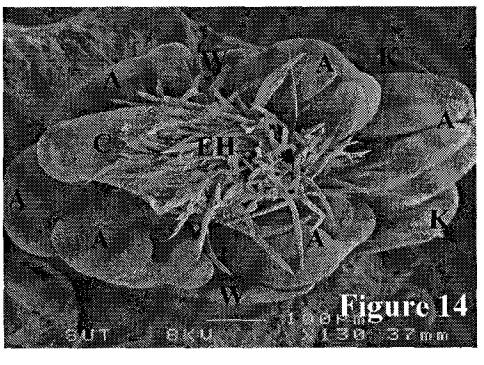


Figure 7. IP initiation clearly initiation IP and bract primordia (BP)
Figure 8. The development of IP and BP
Figure 9. Floral primordia (FP) induction, the development of FP
Figure 10. The extension of FP and the development of sepal primordia (S)
Figure 11. Carpel and petal induction, carpel primordia (CP) and petal primordia (PP)
Figure 12. Petal and stamen initiation, vexillum petal(V), wing petal(W) and keel petal(K)
Figure 13. All organ development, growth of V, W, K and stamen with 5 outer anther (5A) and 5 inner anther (5a)
Figure 14. End of flower development, epidermal hairs (EH)

Acknowledgements

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