

Preliminary studies of vetiver multiplication from seeds

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Abstract

Flowering and seed setting of local varieties of vetiver grass were observed under natural conditions of vetiver collection plots at the Huai Hong Khrai Royal Development Study Centre, Chiang Mai, Thailand. Mature seeds were tested for germination and the plantlets were grown for growth performance recording. It occurred that nine out of ten varieties flowered and produced seeds, though with different germination percentages. Plantlets of three varieties grown in the greenhouse grew rapidly with slight difference in growth, but, all showed the tendencies of propagulization.

Introduction

As far as vetiver multiplication is concerned, seed propagation of this grass is scarcely discussed, regardless the subject of flowering itself (BOSTID, 1993 ; Hopkinson, 2002). Considering the long time problems of transporting planting materials of vetiver grass from the propagating units to remote areas for soil conservation, propagules produced from seeds could practically replace vetiver slips since the seedlings weighed less and consumed reduced packing space. Such alternative approach solving problems in vetiver planting material transportation has been feasibly studied at the Huai Hong Khrai Royal Development Study Centre, Chiang Mai, Thailand, aiming, firstly, at multiplication of the grass from seeds.

Materials and methods

Field observations on flowering and seed setting of ten varieties of local vetiver grass grown in the vetiver collection plots at the Huai Hong Khrai Royal Development Study centre were conducted. The varieties were coded as HKC 01, HKP 02, HKPS 09, HKPW 14, KHS 03, HKSU 01, HKUD 01, HKUH 07, HKUH 09 and HKUT 05. Mature seeds of five varieties, i.e HKC 01, HKP 02, HKPW 14, HKS 03 and HKUD 01 were sown for seed germination tests. Seedlings of three varieties, HKP 02, HKPW 14 and HKUD 01, were grown in black polyethylene bags containing soil compost. The growth of these seedlings were observed under the greenhouse conditions of approximately 30% of shading.

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Results and discussion

1. Flowering and seed setting

From 2 years of field observations on flowering it revealed that nine varieties of vetiver grass tested flowered under field conditions and only one variety, i.e. HKSU 01, failed to flower. Flowering took place in late June and seed setting was noted in late August. In the second year of observation, records were made on flowering percentage of five varieties, i.e. HKC 01, HKP 02, HKPW 14, HKUD 01 and HKS 03. Records showed the flowering percentages being 65.66 %, 54.76%, 100%, 90.52% and 70.83% while those of seed setting were 0%, 14.45%, 15.15%, 40.42% and 26.38%, respectively. Although seed setting percentages were relatively low but it was worthy to note that each inflorescence of the plants of the last four varieties bore abundant amount of seeds. As for variety HKC 01 the plants did not set seed at all in any year.

Mature seeds of the 4 varieties were sampled and sown for seed germination records in September of the second year. It was found that the seeds started to germinate six days after sowing and reached the maximum percentages within 10 days. Germinating percentages were 36.16%, 31.46%, 43.43% and 16.10 % in variety HKP 02, HKPW 14, HKUD 01 and HKS 03, respectively.

2. Seedling growth performance

Seedling growth of 3 varieties, i.e. HKP 02, HKPW 14 and HKUD 01 were observed under greenhouse conditions, in terms of plant height expressed as the length of the longest leaf of the clump, number of tillers per clump and clump thickness in terms of width x length. Mean values of 20 plants per variety were considered. It could be concluded from figure 1 by the mean values taken at 1, 3, 7, 11 and 15 months after transplanting that plant height of the seedlings of all varieties increased rather slowly during 7 months of growth (from M1 to M7) but the increase went up sharply in month 11 (M11) and then declined in month 15 (M15). Dying back of mature leaves, starting their growth in the earlier months, were responsible for such declines in the longest leaf length.

As seen from the average number of tiller per plant from figure 2, rapid growth of the seedlings in all varieties were obvious, especially in month 15 (M15). The results of this category was supported by that of the average clump thickness of each plant as shown in figure 3.

However, progressive growth of the plant has still been observed and the plants were all vigorous and healthy as could be seen in figure 4.

From results described above it could be marked that seed propagation could be practiced in vetivar varieties that set seeds under natural conditions. Although seed germination percentage was rather low, but treatments promoting seed germination was not actually necessary since a large amount of seeds could be extracted from one inflorescence. Moreover, seed germination was not complicated as the seeds are of non-dormant type. Another advantage considered was that the seedlings grew slowly after germination but resumed rapid growth some months later, making shipments of less space-consuming possible during the early months of growth.

Yet, further studies on this matter were still required especially those of the field trials. Concerned evaluations as well as precautions in different aspects were also needed.

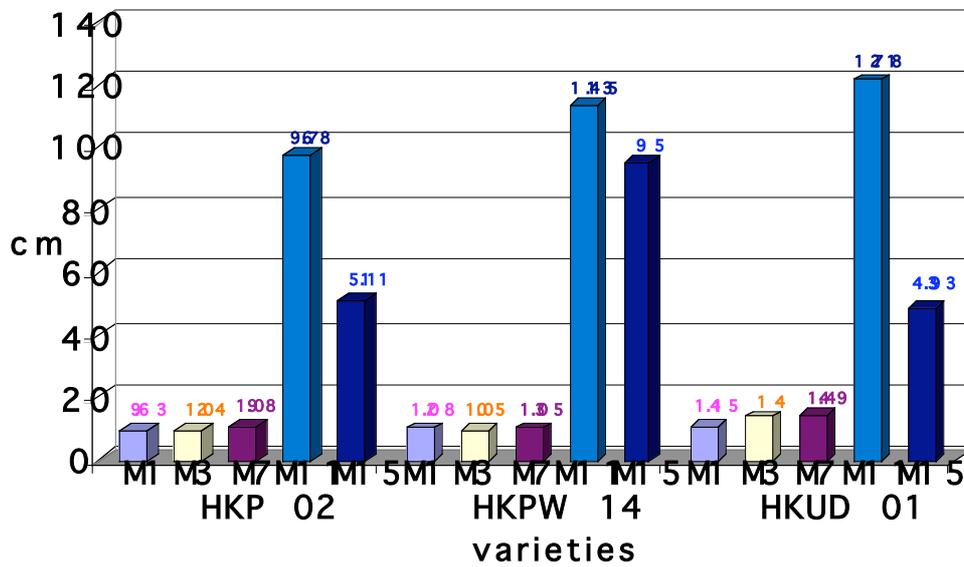


Figure 1 Means of plant height of vetiver plants obtained from seeds of three varieties

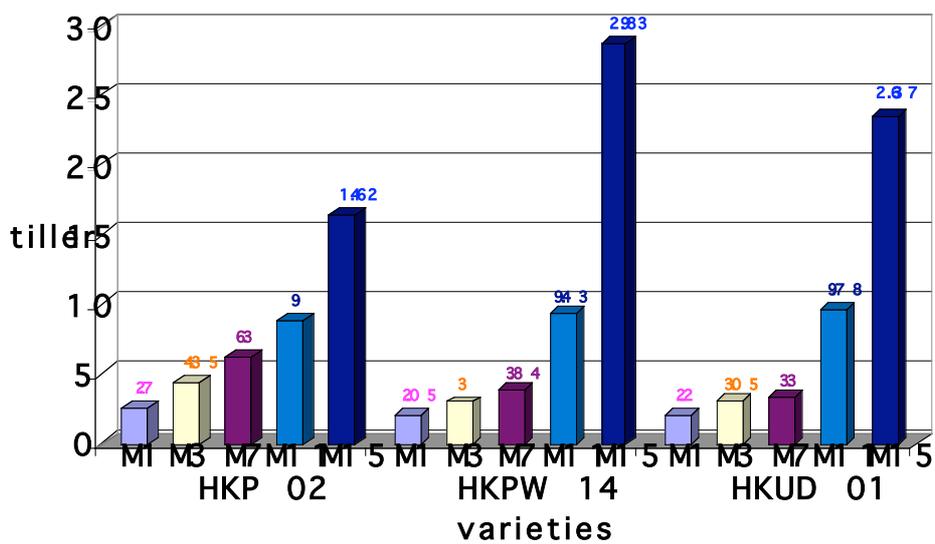


Figure 2 Means of number of tillers per clump of vetiver plants obtained from seeds of three varieties

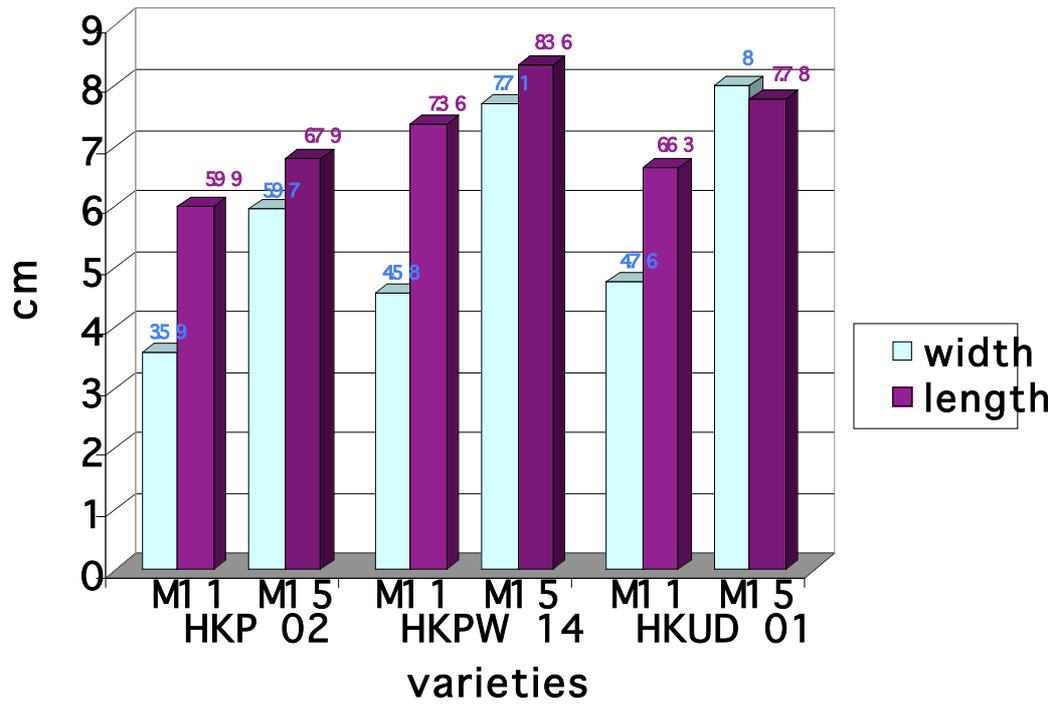


Figure 3 Average clump thickness of vetiver plants obtained from seeds of three varieties



A



B



C

Figure 4 Vetiver plants obtained from seeds, one seedling per bag, of varieties HKUD 01 (A), HKPW 14 (B) and HKP 02 (C) at 11 months after transplanting

References

- Board on Science and Technology for International Development. 1993. Vetiver Grass. National Academy Press, Washington. 169 p.
- John Hopkinson. 2002. The potential of vetiver grass to produce fertile seed when used for roadside stabilization in Cook Shire. [Online]. Available: http://www.vetiver.com/AUS_weediness.pdf (2006, 27 June)