Biology of Mudplantain (Heteranthera reniformis Ruiz et Pavon) and its Control in Flooded Rice

by

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SUMMARY AND CONCLUSIONS

The life history study indicated that mudplantain growth follows an approximate sigmoid curve from germination to 118 days later. Capsules appear between the 48th and 62nd day after germination and their production increases progressively during the cycle.

Through the sunlight reduction study it was determined that mudplantain is more adapted to grow under shade since the plants grew more and at a higher rate under reduced light. This finding disproves the hypothesis that mudplantain does not tolerate shade.

Water depth was found important in the growth of muaplantain in the seedling stage. A depth of 5 cm was the most favorable, while lower or higher depths reduced growth. This shows why it is particularly adapted to grow in flooded rice. Moreover, it is obvious that it would be impossible to control mudplantain by flooding, since the rice would not tolerate more than 10 cm of water in the initial stages and the weed is not killed by this or greater water depths.

The germination studies showed that mudplantain seeds germinate only under light and that germination decreased as light intensity decreased. Light alone, however, did not stimulate germination since it had to be combined with alternate day/night temperatures.

Chilling, scarifying, or soaking the seeds did not promote germination under dark conditions nor improve germination under outdoor conditions.

Seed germination was affected by germination media and planting depth. Water gave the highest germination followed by puddled soil and then by moist soil. Seeding at soil depths greater than one centimeter prevented germination. These two findings indicate a highly specific adaptation of mudplantain to the environment and show that it would be highly non-advantageous for mudplantain seeds to germinate in a non-flooded environment since they also require water for best growth. At the same time, it would be very difficult for a mudplantain seed to germinate from great soil depths since such a small seed probably would not be able to nourish the seedling while emerging until it could depend upon photosynthesis to support itself. It was also observed that mudplantain germination under field condition is delayed with respect to screenhouse conditions, perhaps due to the land preparation which covers the seeds with soil to varying degrees and thus more time is required for these seeds to germinate.

The vegetative propagation studies demonstrated that mudplantain propagates by stolons. Regrowth ability depends on the stolon composition. It was higher for those stolons with leaves and low for stolons without leaves, regardless of whether or not they had roots.

The chemical control studies indicated that mudplantain generally exhibits a great resistance to the herbicides employed. Only butachlor at 2.5 kg ai/ha and oxadiazon at 1.0 kg ai/ha in the dry seeded rice experiment gave excellent control. However, mudplantain did not reduce rice yields, probably because the field was invaded by knotgrass, and agressive weed which was not controlled by any of the treatments.

Finally, a logical suggestion is that the best control is obtained by a rapidly established, dense rice stand growing under optimum condition in the case of pre-germinated rice or by the use of chemicals for dry seeded rice. Competition studies are indicated to determine the exact damage caused by this weed in rice.