

locations, was successful at 54 locations where no regrowth occurred. Biological control was instigated at 132 locations. The agents released were the weevils, *N. eichhorniae* and *N. bruchi*, and the moths, *Niphograptia albiguttalis* and *Xubida infusella*. *N. albiguttalis* failed to establish while *X. infusella* established at one site. The two *Neochetina* weevils became widely established, and where populations remained undisturbed on water hyacinth growing on large water bodies, successful control resulted. On Sepik River lagoons, weevil damage reduced flowering and decreased the production of offshoot ramets which caused large mats of the weed to break up and then sink or to be flushed away in smaller sections. Damage caused by the weevils increased over three to six years culminating in mats collapsing over a 12 month period in 1994/95. The weed cover on Sepik lagoons decreased dramatically despite continued spread. The improvement to village life was equally dramatic with the return to better levels of nutrition, health and activity. In another region, in a pond where *N. eichhorniae* was released during 1986, control of the weed has been maintained since 1991. Elsewhere, in a lake with elevated nutrient levels, water hyacinth cover was reduced from 70% to less than 30% in two and a half years by both *Neochetina* species. This study presents unambiguous examples of the value of *Neochetina* species as control agents for water hyacinth.

---

## The Development of Mycoherbicides for the Management of Parasitic Weeds of the Genus *Striga* and *Orobanche* - a Review and Recent Results

J. KROSCHER<sup>1</sup>, D. MÜELLER-STÖEVER<sup>2</sup>, A. ELZEIN<sup>2</sup>, and J. SAUERBORN<sup>2</sup>

<sup>1</sup>University of Kassel, Institute for Crop Science, Steinstr. 19,  
37213 Witzenhausen, Germany

<sup>2</sup>University of Hohenheim, Institute of Plant Production and Agroecology  
in the Tropics and Subtropics (380), 70593 Stuttgart, Germany

Parasitic weeds of the genus *Striga* and *Orobanche* are causing considerable yield losses in cropping systems south of the Sahara and in the WANA-region. Their management is unsatisfactory since present control methods are still not efficient enough to control the underground development stages of the parasites. Hence, most of the control methods do not lead to a yield increase in the first years of application. Fungal antagonists of the genus *Fusarium*, especially *F. oxysporum*, which have been isolated from diseased plants of *Striga hermonthica* and *Orobanche cumana*, have been proven to be highly pathogenic to all developmental stages of the parasites including seeds. In addition, they are highly host specific and non-pathogenic to a wide range of crops tested, thus meeting two important criteria to be used as mycoherbicides. Applied as solid medium in field trials, these fungi were shown to be highly effective, but the inoculum amount has to be reduced to a practicable level. Therefore, different formulations (alginate with nutrient amendments; wheatflour-kaolin granules - 'Pesta') with fungal propagules have been investigated. Compared to the untreated control, 'Pesta' applied in dosages of 0.4 and 1 g per pot (2 kg of soil) reduced the emergence of *Striga* and *Orobanche* shoots by 80% and 71%, respectively. Formulations on the basis of alginates have been advantageous to

maintain the viability of *F. oxysporum* over a time period of at least 12 months at room temperatures ( $\pm 20^{\circ}\text{C}$ ). Future studies are aiming to further develop the formulations and to test their efficacy under field conditions.

---

## **Stumpout™ - Commercial Production of a Fungal Inoculant to Prevent Regrowth of Cut Wattle Stumps in South Africa**

C. L. LENNOX<sup>1</sup>, M. J. MORRIS<sup>2</sup>, and A. R. WOOD<sup>1</sup>

<sup>1</sup>ARC/Plant Protection Research Unit, Weed Research Division,  
Private Bag X5017, Stellenbosch 7599, South Africa

<sup>2</sup>Microbial Products CC, P.O. Box 1105, Howick 3290, South Africa

Many of the introduced Australian *Acacia* species, including black (*A. mearnsii*) and golden (*A. pycnantha*) wattle, are invasive and have infested large areas in South Africa. In the course of experimental trials, naturally infected dead black wattle stumps were found to be colonized by the basidiomycete *Cylindrobasidium laeve*. Tests were conducted by the PPRI Weed Pathology Unit, Stellenbosch, on the effectiveness of this fungus as a biological control agent of cut wattle stumps. Results of field trials showed mortality of treated stumps of both *A. mearnsii* and *A. pycnantha* to be greater than 80% (reaching 90 and 100% in some cases) within 6-12 months of treatment. The product Stumpout™ was registered in 1997 for use as a fungal inoculant to treat and kill wattle stumps. The limited market for the product has dissuaded large business interest in Stumpout™; however, there is a regular demand for the product from conservation organizations and landowners. To meet this demand, Stumpout™ is produced in a small factory on the premises of PPRI Weed Pathology Unit, Stellenbosch, and distributed to clients on request. Clients receive small sachets of the product, consisting of live basidiospores of the fungus *Cylindrobasidium laeve* in an oil formulation. The product is diluted in sunflower oil and 1-2 ml is painted onto the fresh cut surface of the tree stump. The stumps die within a year of treatment. Currently tests are being carried out in order to determine the efficacy of the product against various other alien weed tree species.

---

## **Release and Colonization of the Bindweed Gall Mite, *Aceria malherbae*: A Field Bindweed Biological Control Program for the Texas High Plains**

G. J. MICHELS, D. A. FRITTS, and J. B. BIBLE

Texas Agricultural Experiment Station,  
2301 Experiment Station Road, Bushland, Texas 79012, USA

*Aceria malherbae* Nuzzaci is a gall-forming eriophyid mite imported from Greece for biocontrol of field bindweed. The mite injures plants by producing galls on leaves, petioles, stems and roots. Infested plants are yellowed, have deformed leaves, reduced vigor,