

comprise SGT1, and all three SGT1 domains are represented in the fragment. Interestingly, the *Hordeum vulgare* (barley) and *Triticum aestivum* (wheat) SGT1 proteins contain an insert of 12-15 amino acids compared to *P. glaucum* and *Zea mays* (maize) SGT1. This variation in sequence data supports previous phylogenetic relationships, clustering *Z. mays* and *P. glaucum* close in relation to other cereals. Our findings demonstrate that *P. glaucum* expresses a *SGT1* gene with significant similarity to orthologs present in other cereal crops, and that it is expressed early during SA treatment.

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### Putting Humpty back together again: Coastal grassland restoration after afforestation with pines

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The grasslands along the Eastern Shores of Lake St. Lucia make up a large piece of severely threatened vegetation rich in plant species, particularly forbs. For the last 50 years a significant portion of this land has been under commercial pine afforestation. Recent restoration efforts have led to the removal of these plantations over the last 17 years. Many plant species in this fire driven system support underground storage organs which allow them to resprout. Using several response variables I assessed the effects of plantations on two scales of plant diversity and different functional traits for both forb and other grassland species while assessing any successional trajectories in restored sites. Plant community heterogeneity was high for both alpha- and beta-diversity scales within natural vegetation. Restored sites were species poor showing a homogenous pattern for both scales. Restored sites supported very few resprouting species while the opposite was found in natural sites. Contrasting to coastal forest rehabilitation studies this study showed no evidence of natural succession in restored sites. These results indicate that current methods for restoring these grasslands are insufficient and that rehabilitating grasslands may be a lot harder than previously thought. Considerable effort should be made in conserving what is left and more focus should be placed on promoting the pharmaceutical, horticultural and societal value of grassland herbs.

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### Isolation and identification of a novel chlorophenol from a cell suspension culture of *Helichrysum aureonitens*

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A chlorophenol, 1-hydroxy-5-chlorophenylhepta-1,3,5-triene, was isolated as the major phenolic compound from the cells of *Helichrysum aureonitens* suspension cultures. This triene has been proposed to be an intermediate in the acetylene biosynthetic pathway in *Helichrysum* spp., but only the methyl ether form of it has previously been isolated from the roots of *H. coriaceum*. The minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) of the ethanol extract of a cell suspension culture of *H. aureonitens* against *Mycobacterium tuberculosis* H37Rv were found to be 1.0 mg/ml and 2.0 mg/ml respectively and the triene was not active at 200 µg/ml. The ethanol extract of cell suspension cultures and the triene were evaluated for their cytotoxicity against monkey kidney Vero (Vero cells) and human prostate epithelial carcinoma (DU145) cell lines. The inhibitory concentrations (IC<sub>50</sub>) of the triene and crude extract was found to be 1.51 and 12.11 µg/ml against Vero cells respectively. The crude extract and the triene showed similar activity in prostate cancer cell lines by exhibiting IC<sub>50</sub> values of 3.52 and 2.14 µg/ml respectively. The triene warrants further investigation for its potential as an anticancer drug.

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### Propagation and growth of *Ansellia africana* and *Mondia whitei* from cuttings

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Experiments were conducted in the growth incubators (16 °C, 26 °C, 36 °C) and in the nursery with shade cloth of varying light (200, 400, 600, 800 µmole m<sup>-2</sup> s<sup>-1</sup>) at the University of Zululand, South Africa. Mature *Ansellia africana* plants were cut into two lengths, the top leafy shoot and the bottom part with roots (10-15 cm in length, 3-8 mm diameter). Shoots of *Mondia whitei* with a length of 6 cm, basal diameter of 2-3 mm and one node without buds were prepared from a six year old plant growing in the botany garden. Rooting competence of cuttings was compared by growing cuttings in hoaglands solution and in river sand containing 0.5, 1.0 and 2.0 mg per litre NAA concentrations. In *Ansellia africana* plants grown in river sand, the percentage root formation, root numbers, root length and root dry weight were significantly higher (p<0.05) in NAA concentration of 2 mg per litre at 36 °C in both growth room and shade cloth conditions when compared with controls. In

*Mondia whitei* cuttings grown in solution, the percentage root formation was significantly higher ( $p < 0.05$ ) in NAA concentration of 2 mg per litre, while river sand showed no significant difference. Root numbers and root length were significantly higher ( $p < 0.05$ ) in NAA concentration of 0.5 mg per litre for *Mondia whitei* cuttings grown in both solution and river sand.

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## Poster Abstracts

### Promotion of seedling growth in *Jatropha curcas* – a potential oil seed crop for biodiesel

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The effects of aerosol smoke, smoke water, potassium nitrate, naphthalene acetic acid and indole-3-butyric acid on germination and seedling growth of *Jatropha curcas* were investigated. Seed coat removal accelerated water imbibition and germination occurred within 48 h. Seeds exposed to aerosol smoke failed to germinate over the whole study period of three months. There were no significant differences in total germination between the treatments and the untreated control (intact and shelled-seed). However, shelled-seeds had a shorter mean germination time. The seedlings were subsequently, sown in trays under shade house conditions and different seedling growth traits measured after three months. Smoke water, potassium nitrate and naphthalene acetic acid produced significantly heavier seedlings with longer stems and roots, wider stems and a higher vigour index compared to the control treatments. Smoke water, potassium nitrate and naphthalene acetic acid stimulated seedling growth and vigour of *J. curcas*. This opens the possibility of applying these treatments to produce quality seedlings for large scale planting and accelerated plant establishment in production orchards.

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### The effects of experimental warming on flowering phenology, seed production and physiology of 24 fynbos species

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Plants use several environmental inputs in adapting their flowering to a particular season of the year. Information of these environmental controls of flowering is important for production in commercial horticulture and is also significant for assessing whether or not a species is threatened by an environmental change such as global warming. Timing of flowering within and among individuals is of biological importance because of its effects on plant reproduction, fitness and survival. Flowering phenology could be affected by several environmental factors such as temperature and photoperiod. It is known that high night temperatures cause floral abortion. The parameters of flowering phenology focus on the onset and duration of flowering and on synchrony amongst individuals as would occur in nature through global warming. The question of the present investigation is: To what extent would increased temperature interfere with the requirements for flowering and with the physiology of the fynbos in the Western Cape. These effects are currently being examined by testing the flowering phenology, photochemical performance, transpiration rate, growth and reproduction of twenty four different fynbos species comprising of herbs, bulbs, succulents and shrubs. Eight temperature treatments and eight controls are used. Progress in this investigation and preliminary results are discussed.

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### The International Seed Testing Association and seed health testing

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Founded in 1924, with the aim to develop and publish standard procedures in the field of seed testing, the International Seed Testing Association (ISTA) is inextricably linked with the history of seed testing. ISTA has 179 member laboratories (101 ISTA accredited) in 72 countries world wide and about 210 personal members. Membership is a collaboration of seed scientists and seed analysts from universities, research centres and governmental, private and company seed testing laboratories around the world. The aim of ISTA is to develop, adopt and publish standard procedures for sampling and testing seeds, and to promote uniform application of these procedures for evaluation of seeds moving in international trade. In many countries import of seed is only permitted if the seed lot is accompanied by an ISTA International Seed Analysis Certificates. ISTA is independent and acts free from economic interest and political influence. Fourteen subject-focused Technical Committees and one GMO Task Force