

ORAL SESSION 2 – Problems associated with the domestication and use of non-crop species

Seeds of diverse non-crop species in Brazil

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More than ten thousand years ago, when man shifted his lifestyle from hunting and gathering to agriculture, societies began the process of domesticating and selecting varieties of plants to meet their food, clothing and health needs. For a long period of time, these needs were met by a small variety of species. In the 20th Century, agriculture underwent major transformations and new species are now being studied which have great potential for exploitation. With more than 50,000 species, Brazil has one of the richest floras in the world - nearly 19% of the world flora. Brazil's forests and other ecosystems are also an invaluable source of medicinal plants for many human diseases. Several problems that can arise while producing and dealing with seeds of non-crop species will be discussed, including the importance of some knowledge of the biology of the species and how to deal with those seeds in seed testing laboratories.

Desiccation tolerance and germination behaviour of nikau (*Rhopalostylis sapida* Wendl. et Drude) an endemic New Zealand palm

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Rhopalostylis sapida (Arecaceae), nikau palm, is endemic to New Zealand. It is a species of lowland forests and is the southern most palm species in the world. Nikau is regarded as an iconic New Zealand native plant. This paper reports the only detailed study on seed desiccation tolerance and germination in nikau. Fruits were collected from a stand of palms growing in remnant forest in the lower North Island of New Zealand. A preliminary study established that nikau seed lost viability between 25% and 10% seed moisture. In a more detailed study freshly collected fruits were desiccated in silica gel from an initial seed moisture of 44% to 9% over 31 days. Germination, measured by radicle or leaf emergence, was assessed during desiccation. Germination decreased from 95% at 44% seed moisture to 77% at 21% seed moisture. A further 3% decline in seed moisture to 18% reduced germination to 27%. At 15% seed moisture germination was 4%. Control fruits were stored in moist vermiculite at 15°C during the desiccation trial. In vermiculite, seed moisture remained at 44% and germination at 95%. This data suggests nikau seed is non-orthodox in its storage behaviour. Nikau seed germination is slow and erratic. Time to 50% (T₅₀) germination differed depending on seed colour at collection. Red seed took 144 days to reach 50% germination compared to 99 and 98 days respectively for seed collected when yellow or green. Electron microscopy showed evidence of limited starch storage in the embryo, but little of oil or protein storage organelles. No starch was evident in the endosperm.

Development of dormancy breaking treatments to enable germination testing of seeds of medicinal plants grown in Iran

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Medicinal plants native to Iran are important sources of remedies for many maladies. Cultivation of species is an objective to both improve their availability and to assist projects that aim to analyse plants for their active ingredients. However, seed germination testing in the presence of dormancy in non-crop species presents problems in assessing seed quality for sowing. Seeds of 36 important medicinal plant species produced in North Iran (Mashhad), which had been stored in warehouses since October 2005, were tested for germination, both with and without dormancy breaking treatments. On the basis of their behaviour without dormancy breaking, the species were classified into 3 groups: germination > 60% (20