

Developing *Prosopis* as a valuable resource for dry zones

The Forestry Research Programme of the UK Government's Department for International Development (DFID) has supported HDRA in running a series of research and development projects since 1992, on Prosopis trees for drylands and the people who live there. This is a synthesis of the work and its impacts.

Mesquite or algarrobo (*Prosopis* species) are now probably the most common trees in the dry tropics of the world. Many species were widely introduced from their native Americas in the past two centuries, and today, epitomise the problems of, and failures in, promoting new dryland tree crops; a number of which are now invasive weeds.

Over twelve years, researchers at HDRA and their collaborators have played a valuable role in identifying and overcoming some constraints to the development of these trees as a resource, adapting activities to meet changing demands. In so doing, support continues to be offered for the provision of much-needed resources to improve livelihoods of some of the poorest people in the world's drylands.

Finding the right species

Early HDRA trials indicated that for the most arid areas with no post-planting care, *Prosopis* species are able to survive and grow better than trees of any other genus. DFID supported two projects from 1992 to 1995, assessing the field performance of over 100 accessions of 12 *Prosopis* species under very arid conditions in Cape Verde, studying physiological aspects of drought-tolerance in Oman, and investigating techniques for selection and vegetative propagation. Parallel to this was a demonstration and extension project in India, which also involved *Prosopis* species, and field-tested some of the same accessions and techniques.

As results were presented to international audiences, it became increasingly evident that much work on *Prosopis* was being duplicated around the world, and there was no single knowledge base on these widespread tropical species. Furthermore, there were some obvious taxonomic problems that required resolution.

Gathering global knowledge

In 1998, work began on a programme to gather the global knowledge on the most important and widespread tropical species, *Prosopis juliflora* and

related tropical species. By 2001, a comprehensive monograph and reference database were produced which are still in high demand, and a technical extension manual, aimed specifically at India, was also published, in English and Hindi.

Four principal constraints to the development and promotion of *Prosopis* were identified, centred on: problems in species identification, tree and stand management, processing of tree products, and their commercialisation. Some or all of these are reasons for lack of success in developing many dry zone trees, indicating common lessons to be learnt.

Making an impact

Aiming at management and utilisation of *Prosopis*, workshops and a series of training courses were organised in India in 2001. These proved popular, with demonstrations of saw milling, pod processing, feed mixing and making human foods. Participants at all levels noted a problem in policy and attitude towards these trees as a resource. Three policy briefs were then produced in 2002 and widely distributed; one aimed at India, one for a global audience, and one for where *Prosopis* is a problem weed. A further six country-specific briefs are to follow in 2004, for Ethiopia, Sudan, Kenya, South Africa, Sri Lanka and Brazil.



Converting weedy *P. juliflora* stands to productive agroforestry, high-pruning scrub trees to single stems. A novel approach promoted by HDRA - demonstrated during a training course in Tamil Nadu, India, 2001.

Aiming at overcoming the taxonomic problems, HDRA also began work on identifying the main species, using hypotheses based on the global literature review as well as leaf and seed samples collected worldwide. Detailed leaf measurements, chromosome numbers and molecular markers were used to separate the two most common tropical species, *P. juliflora* and *P. pallida* that were previously treated together. From this work, a field identification guide was published in 2004.

Spreading the knowledge

These publications and this wealth of experience, are, thanks to DFID, now available to all individuals and organizations with an interest in seeing this 'tree of the poor' becoming one which helps lift the poor to a better and sustainable life.

Identifying Tropical *Prosopis* Species: A Field Guide. Pasiecznik NM, Harris PJC, Smith SJ, 2004. HDRA, Coventry, UK. 31pp.

The *Prosopis juliflora* - *Prosopis pallida* Complex: A Monograph. Pasiecznik NM, Felker P, Harris PJC, Harsh LN, Cruz G, Tewari JC, Cadoret K, Maldonado LJ, 2001. HDRA, Coventry, UK. 162pp.

Managing *Prosopis juliflora* (Vilayati Babul): A Technical Manual. Tewari JC, Harris PJC, Harsh LN, Cadoret K, Pasiecznik NM, 2000. CAZRI, Jodhpur, India and HDRA, Coventry, UK. 94pp. (English and Hindi language versions). Available to download at www.hdra.org.uk/int_res.

The Genus *Prosopis*: A Reference Database. Cadoret K, Pasiecznik NM, Harris PJC, 2000. (Version 1.0): CD-ROM. HDRA, Coventry, UK.

Policy briefs. Pasiecznik N, 2002. HDRA, UK.

1. *Prosopis* (mesquite, algarrobo): Invasive weed or valuable forest resource?
2. Exploiting the value of *Prosopis* for dryland forestry and agroforestry systems.
3. *Prosopis juliflora* (vilayati babul) in the drylands of India: develop this valuable resource - don't eradicate it.

Selected additional dissemination

Management and Utilisation of *Prosopis juliflora* - Training Manual. Neelakantan KS, Dasthagir MG *et al* (eds.), 2001. Forest College and Research Institute, Tamil Nadu Agricultural University, Mettupalayam, India.

***Prosopis juliflora*; Part 1 - Don't see it as a disaster; Part 2 - Unexplored multiple uses.** Countrywide Classroom Network educational video films, 2000. University Grants Commission Distance Learning Programme, India.

***Prosopis* Species in the Arid and Semi-Arid Zones of India.** Tewari JC, Pasiecznik NM, Harsh LN, Harris PJC (eds.), 1998. Proceedings of a Conference, 21-23 November 1993, CAZRI, Jodhpur, India. The *Prosopis* Society of India and HDRA, Coventry, UK. 128pp.

***Prosopis* genetic improvement trials in Cape Verde.** Harris PJC, Pasiecznik NM, Bradbury M, Vera Cruz MT, 1997. In: Felker P, Moss J (eds.), *Prosopis: Semi-Arid Fuelwood and Forage Tree. Building Consensus for the Disenfranchised.* Center for Semi-Arid Forest Resources, Kingsville, USA.

Problems and potential of *Prosopis*. Harris PJC, Pasiecznik NM, Bradbury M, Ramírez L, 1998. In: Prendergast HDV *et al.* (eds.), *Plants for Food and Medicine.* Royal Botanic Gardens, Kew, UK.



For copies of the publications mentioned, contact HDRA (enquiry@hdra.org.uk) or see the HDRA website (www.hdra.org.uk/int_res) where they are becoming available online. For more information on these projects and on-going work, contact Phil Harris (pharris@hdra.org.uk) or Nick Pasiecznik (npasiecznik@hdra.org.uk)