

UNBLOCKING THE OBSTACLES TO OPEN USE

Marie Connett and Richard Jefferson

CAMBIA's BIOS (Biological Innovation for Open Society) Initiative, GPO Box 3200, Canberra, ACT 2601, Australia (www.cambia.org; www.bios.net; www.bioforge.net)

E-mail: marie@cambia.org

Past IUFRO presentations have recognized great potential for using biotechnology innovations in forest plantings to solve problems, ranging from processing industry costs to reclamation of eroded sites to providing increased fuel content (the major use of wood worldwide). However, much work at research institutions, even work that might support wider public acceptance (e.g. up- or down-regulation of endogenous pathways) may never reach end users, and even the most well-coordinated and technically advanced R&D programs are faced with significant challenges to commercialization. Both for clonal forestry and for transgenics, use of the discrete technologies embodied in or used to select and produce the trees may require many intellectual property licenses, and public acceptance concerns represent another freedom to operate risk. For transgenics, adding regulatory timelines dictated by the life cycles of forest trees, the results is likely to be few commercializations, only for a few of the highest margin products. How can we unblock the pathway between valuable research and the end users?

Some of the big obstacles can be addressed and at least mitigated by willingness to innovate, not only in biotechnology inventions, but in how they are protected and distributed. CAMBIA has long licensed GUS technology widely, and is now employing a new license mode for what experts in the field recognize as a broad work-around of *Agrobacterium*-mediated transformation, with modified plasmids and methods to mediate gene transfer to diverse plant families. We anticipate this will lead to better understanding and use of naturally evolved bacteria-plant interactions; a variety of analyses confirm integration of single or few T-DNA copies into the plant genome, and support further modifications to facilitate mobilization into plants using non-phytopathogenic bacteria while removing lateral transfer functions between bacteria. This technology is not in the public domain. Any research institution or company can have a royalty-free license to use this technology -- but only by agreeing to share, with others that agree to the same conditions, information on the safety of the technology and improvements, and not to assert derivative intellectual property rights against each other (thus creating a protected commons of enabling technology). In the IT industry, such "open source" licensing has spawned successful businesses large and small, and significant profits. Open source licenses are now being applied and applauded for a wider variety of intellectual property, particularly in countries such as South Africa and Brasil. In tree improvement worldwide, similar intellectual property systems have long been in use--CAMBIA is the first of many, we hope, to employ such a model in biotechnology. In IT, an industry dogged by vulnerability to all sorts of worms, companies that use open source licenses have attracted user engagement in improvement and implementation, and little hacker attack. In the model exemplified by the Apache server, the technology has been adapted to many environments, while supporting a positive public image and a community valuing those who invent. Can we imagine that for our industry?