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AN INQUIRY INTO THE POTENTIAL FOR PLANT
PIRACY THROUGH INTERNATIONAL INTELLECTUAL
PROPERTY CONVENTIONS

Plant Breeder's Wrongs

A Report by the
Rural Advancement Foundation International
(RAF)

In Partnership with
Heritage Seed Curators Australia
(HSCA)

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Acronyms and other Terms:

AVRDC	Asian Vegetable Research and Development Centre, Taiwan
CBD	Convention on Biological Diversity
CGIAR	Consultative Group on International Agricultural Research
CGRFA	Commission on Genetic Resources for Food and Agriculture
CIAT	International Centre for Tropical Agriculture, Colombia
CIMMYT	International Maize and Wheat Improvement Centre, Mexico
CLIMA	Centre for Legumes in Mediterranean Agriculture, Australia
CSIRO	Commonwealth Scientific and Industrial Research Org., Australia
CSO	Civil Society Organization
DUS	Distinctness, Uniformity, Stability
FAO	UN Food and Agriculture Organization
GRDC	Grains Research and Development Corporation, Australia
HSCA	Heritage Seed Curators Australia
IARC	International Agricultural Research Centre
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics, India
IITA	International Institute for Tropical Agriculture, Nigeria
ICARDA	International Centre for Agricultural Research in the Dry Areas, Syria
ICIS	International Crop Information System
IP	Intellectual Property
IPGRI	International Plant Genetic Resources Institute, Italy
IRRI	International Rice Research Institute, Philippines
MTA	Material Transfer Agreement
NOTAGS	Not Tried Against Germplasm Source
NPB	No Proof of Breeding
NZ DSIR	Department of Scientific and Industrial Research, New Zealand
OECD	Organization for Economic Cooperation & Development, France
PBR	Plant Breeders Rights
PBRO	Plant Breeders Rights Office
PREPBR	Variety Predates PBR
PROBUSE	Abuse of Provisional Protection
QDPI	Queensland Department of Primary Industries, Australia
RAFI	Rural Advancement Foundation International
SGRP	System wide Genetic Resources Programme
SINGER	System-wide Information Network for Genetic Resources of the CGIAR
Sui generis	“of its own kind”
TRIPs	Trade-Related Aspects of Intellectual Property
UPOV	Int’l. Union for the Protection of New Varieties of Plants
VIDA	Victorian Institute for Dryland Agriculture, Australia
WANA	West Asia North Africa
WIPO	World Intellectual Property Organization
WTO	World Trade Organization

Proposition

That intellectual property regimes for plant varieties are inherently predatory upon the knowledge of indigenous peoples and farming communities.

Question: Should governments adopt intellectual property regimes such as “Plant Breeders Rights” for plant varieties and plant germplasm? Or should they amend the WTO’s TRIPs Chapter to exclude monopoly protection over plant material?

Method: RAFI and HSCA reviewed grants and applications at the Australian Plant Breeders’ Rights Office dating back to the enactment of legislation in 1987. RAFI also reviewed a number of other patent and PBR claims in other industrialized countries.

Observation: The initial nine month experiment revealed no fewer than 147 plant variety or plant germplasm claims and licences having significant irregularities. The 147 cases involve 124 presumed Farmers’ Varieties from at least 43 countries and seven International Agricultural Research Centres that either are - or are possibly - examples of biopiracy. Beyond Australia, six other countries are allowing abusive intellectual property claims.

Findings: International intellectual property regimes are inherently predatory upon the knowledge of farming and indigenous communities.

Conclusion: WTO member states should eliminate the requirement to “protect” plant material when the TRIPs chapter is reviewed in 1999.

Premises

Prior Questions in Preparation for the 1999 TRIPs Review

Under the terms of the Trade-Related Aspects of Intellectual Property (TRIPs) chapter of the Uruguay Round Agreement of 1994, signatory states are obliged to permit patents on microorganisms and to either grant patents or some other form of “effective” *sui generis* (specifically designed) protection for plant varieties. The

27.3(b) plants and animal other than microorganisms, and essentially biological processes for the production of plants or animals other than non-biological and microbiological processes. However, members shall provide for the protection of plant varieties either by patents or by an effective sui generis system or by any combination thereof. The provisions of this paragraph shall be reviewed four years after the date of entry into force of the WTO Agreement.

key language with respect to plant varieties is covered by Article 27.3(b) of the TRIPs accord. That text (below) sets out categories of inventions that can be excluded from protection. While animals may be excluded, whole plant varieties must be included. “Microorganisms” an undefined term that can include everything from human cell lines to plant germplasm, must be protected by industrial patents.

It is an indication of the contentious nature of this provision that governments could not agree to specify UPOV (the Union for the Protection of New Varieties of Plants) as the operational framework for the protection of plant varieties. A further indication of disagreement is that governments accepted to meet in 1999 to review the provision. The United States and some other industrialized countries have suggested that they are unhappy with the vague nature of the

sui generis option and would rather require member states to either accept UPOV’s very stringent 1991 Convention as the sole basis for compliance - or to set the “effective” intellectual property (IP) standard at the yet more demanding level of utility patents. Currently, most OECD states are members of UPOV and some states also allow plant variety patents.

Feared promises: For many years, Civil Society Organizations (CSOs) have argued that IP over plant varieties is detrimental to world food security and to the well-being of agricultural research and of farming communities. In the nineties, CSOs began to document numerous examples of biopiracy - cases wherein the knowledge of traditional medical practitioners with respect to plants and animals was being usurped by transnational pharmaceutical enterprises for the development of so-called “new” patented medicines¹. Despite these examples, the seed industry and national “Plant Breeders’ Rights” (UPOV’s euphemism for its *sui generis* system of variety IP protection) offices, denied that commercial breeders would be interested in pirating agricultural plants.

False premises: The seed industry’s argument was premised on the belief that the South’s farmers use “primitive landraces” while the North’s commercial breeders need “sophisticated” (or “modern”) varieties.

It would be highly unlikely, industry maintained, that a farmers' variety plucked from the soils of East Africa would meet the needs of industrial agriculture in Germany. The industry also contended that by and large the South's growing conditions were not replicated in the North and therefore, even highly-productive varieties from International Agricultural Research Centres were unlikely to perform usefully in the North where pests, diseases, climates, and markets were so radically different. Finally, government Plant Breeders' Rights Offices (PBROs) were adamant that the UPOV Convention's three key requirements - for Distinctness, Uniformity, and Stability (DUS) would prevent piracy.

Prior to a considered and reasonable review of Article 27.3(b), industry's assertions must be tested. Can intellectual property over plant varieties be predatory upon the knowledge and resources of farming and indigenous communities? Can the regulatory framework provided via UPOV and WIPO be abused to legislate biopiracy? The short answer to both of these questions is an undeniable "yes".

Piracy

The Initial Evidence of Piracy in Australia

In December, 1997, RAFI received financial support from the Geraldine R. Dodge Foundation making it possible to begin a detailed review of past and present cases of suspected plant biopiracy in the context of the TRIPs review. RAFI had determined to study the cases and policies of the United States since the USA is the most aggressive promoter of plant variety monopolies. However, the U.S. Plant Variety Protection Office's public database and the information available on varieties in print was unhelpful. For several reasons, Australia offered the best model. First, Australia's political posture in the WTO and elsewhere is similar to that of the USA. Second, some areas of Australia have similar growing regions to the USA. Third, like the USA, Australia is a major importer of crop germplasm. Fourth, agricultural economists in Australia have recently provided detailed studies of their country's use of foreign germplasm. Finally, the Australian Plant Breeders' Rights Office provided more data (electronically and in print) than most of its counterparts among industrialized countries. RAFI also decided to begin by studying Australian germplasm flows connected to the Consultative Group on International Agricultural Research (CGIAR) via its Trust Agreement with the UN Food and Agriculture Organization (FAO). The FAO-CGIAR accord is a legal document recognized by the international community (including Australia and the USA) and it encompasses more than a half million plant accessions. If biopiracy is prevalent in OECD IP offices, Australia would be very likely to offer examples. If plant piracy was a myth, a thorough review of the Australian data - and a clean bill of health - would be convincing proof.

Within days, RAFI discovered that two chickpea varieties held under the FAO Trust Agreement with the International Centre for Research in Semi-Arid Tropics (ICRISAT) were awaiting acceptance for possible certification in the Australian PBRO. The two applications came from public plant research institutes attached

to the Government of Western Australia. If granted, the institutes would have won monopoly control over the varieties well into the next century. Working closely with FAO and ICRISAT, RAFI forced the Australian agencies to abandon both claims.

Then in January, 1998, the continuing research turned up three other Australian claims based on FAO Trust material, this time held by the International Centre for Agricultural Research in Dry Areas (ICARDA). In dismaying contrast to the ICRISAT experience, it took several months of work and the strong support of FAO and the CGIAR to persuade ICARDA to demand that the PBR applications be dropped. The same Western Australia institutes, led by the Centre for Legumes in Mediterranean Agriculture (CLIMA) were involved.

Early in 1998, Heritage Seed Curators Australia (HSCA) - a highly-regarded CSO with a strong history in plant germplasm conservation - joined with RAFI in the review of Australian claims and provided invaluable insight and expertise in the in-depth evaluation of each claim. As the months ticked by, several additional claims on FAO Trust material were uncovered. These claims were associated with six other International Agricultural Research Centres (IARCs) and the Plant Breeders' Rights or patent offices of six additional countries.

Acting on a proposal made by RAFI and HSCA, the CGIAR and FAO jointly called for a global moratorium on intellectual property rights claims on FAO Trust germplasm. (Please see RAFI News Release, "Toward a Global Moratorium on Plant Monopolies" at RAFI's website (<http://www.rafi.org/pr/release13.html>). The effect of the moratorium initiative has been largely invisible - but also considerable. It is generally-held that several OECD governments have undertaken their own internal reviews and that some pending applications have either been voluntarily withdrawn, cancelled, or suspended. Further, some governments are actively reviewing their Material Transfer Agreements (MTAs) to give national legal weight to the FAO-CGIAR Trust Agreement by explicitly honouring the requirement not to allow IP on plant germplasm. The national genebank of the Netherlands has led the world in this initiative.

RAFI and HSCA provided an interim report on the Australian research to 118 governments during the June 8-12, 1998 session of the FAO Commission on Genetic Resources for Food and Agriculture (CGRFA). Following that constructive exchange, the first phase of research was completed in August, 1998. The findings and preliminary recommendations to national policy-makers are contained within this report.

In five cases, Australian agencies have withdrawn PBR claims under pressure. This report however, does not ascribe blame or draw conclusions with respect to the other 142 IP claims summarized in Table 5 (the main table of this study). The institutions, claims, and varieties discussed here may - or may not - be valid under national law or international conventions. Some of the listed claims may be legal but would be considered unethical or, at least, highly-inappropriate by most readers. Further legal investigation would be required in order to reach definitive answers. More information is needed from the claim applicants. Since the costs of legal challenges to intellectual property are prohibitive for non-profit Civil Society Organizations, final conclusions on each claim cannot be offered.

Both RAFI and HSCA wish to make it clear that nothing in this inquiry implies anything other than the highest respect for the world's plant breeders (in conventional institutions or in communities) and the important work they undertake. This inquiry reveals a fundamental flaw in the concept of IP over life forms - not the failure

of a science or a profession. Even in the case of Australia, where abuses appear to be rampant, the overwhelming majority of plant breeders meet the highest standards of professional behaviour.

In this context, we do not hesitate to state that the varietal descriptions and histories provided by most PBR Offices exposes an isolationism and arrogance they can ill-afford. With rare exceptions, their services to ensure society that plant monopolies are warranted are pathetic. The failure of these Offices and of UPOV and WIPO to provide adequate descriptions of plant varieties and to cross-reference their variety lists with one another in a usable manner is inexcusable. Recommendations are offered in the final section of this report.

This report is prepared in the hope that the governments and institutes directly involved will accept responsibility for further inquiry and will report their findings to the international community. RAFI and HSCA will also continue to monitor the situation to the extent that limited resources make possible. In fairness to Australia - and in recognition of the likely scope of predatory practices, this research must now move on to explore abuses in other industrialized countries.

For the purposes of government policy-setting en route to the 1999 WTO TRIPs Review, however, the several proven examples of abuse and the clear possibility of a large number of other abuses should be sufficient to confirm that our original premise is correct - that intellectual property regimes over plant material can encourage biopiracy and can be predatory upon the knowledge and resources of farming and indigenous communities. It would, therefore, be highly improper for the members of the World Trade Organization to continue to press for the inclusion of plant varieties or germplasm within the framework of TRIPs when these systems have been proven to be inequitable and discriminatory.

The FAO-CGIAR Trust Agreement

In October, 1994, the Consultative Group on International Agricultural Research (CGIAR) and the UN Food and Agriculture Organization (FAO) signed an Agreement that placed plant germplasm specifically identified by each CG Centre under the policy oversight of the FAO Commission on Genetic Resources for Food and Agriculture (CGRFA). By the Agreement, each CGIAR Centre recognized that it holds the designated accessions "in trust" on behalf of the international community and under the auspices of FAO.

Each CG Centre was left to determine the exact germplasm that would be placed "in trust". At present, more than 500,000 accessions have been designated of the CG's total of about 600,000 accessions. In principle, most Centres are attempting to place all of their collected germplasm under "trust". Material not under trust tends to be accessions not well enough identified or, occasionally, material directly bred by the Centre or bred in conjunction with non-Centre partners.

Under the terms of the Agreement, Centres are committed to ensuring that "in trust" germplasm is maintained in the public domain and not allowed to be included in any intellectual property claim. Centres are obliged to ensure that third-party recipients of "in trust" samples also agree to prevent claims on the germplasm. The FAO-CGIAR Agreement makes it the responsibility of both FAO and CGIAR to actively protect the integrity of the designated germplasm.

The Agreement was specifically requested and endorsed by the FAO Commission and the Convention on Biological Diversity - meaning that 170+ States accepted the accord - including Australia. The Agreement does not specifically oblige States to observe its terms, however. This loophole allows rogue governments or institutes to legally pilfer CG genebank material. Recognizing this, FAO and CGIAR acted swiftly in early 1998 to call for a "voluntary" moratorium on intellectual property claims on any plant variety that might contain "in trust" germplasm.

*RAFI and HSCA believe that the terms of the Agreement legally oblige the signatories to protect the designated "germplasm" from IP claims - not merely whole accessions. In other words, any gene or trait extracted from designated material cannot be used in an IP application. Some countries argue erroneously, that the accord only applies to whole accessions. These and other issues remain to be debated at FAO. For further information on the controversial history of the Trust Agreement, please see *Development Dialogue*, the Journal of the Dag Hammarskjöld Foundation, for its special issue (1998) titled, *The Parts of Life* by Pat Roy Mooney of RAFI. Chapter 4 of this edition, "Parts Patrician" offers an overview of the CGIAR and of the Agreement. The text is available electronically on RAFI's internet homepage at www.rafi.org.*

Plants

The 80 Plant Kinds Most Commonly Abused

With only a few exceptions, the plant kinds in question fall outside the realm of conventional commercial agricultural research. For this reason, the varieties are difficult to assess either scientifically or legally. How does one meet the IP criteria for absolute world novelty (or “distinctness”) if there is little information available in the scientific literature? Certain patterns have emerged however...

Origin: At least a third of the claims involve varieties acquired from countries with Mediterranean climates. Since most of the possible abuses are traceable to Australia, this is hardly surprising. Large regions of Australia have a Mediterranean climate, including South Australia and parts of Western Australia, Victoria, and New South Wales. Other areas of the world that have a similar climate are central Chile; the Iranian highlands; central California; the Cape of South Africa; and, of course, the long African, Asian, and European coastline of the Mediterranean Sea.

A second feature of the suspect species is that 36 of the dubious IP applications are based on indigenous Australian germplasm. HSCA has been able to confirm traditional names and uses for 16 of the 36 in an initial examination, but there is every indication that all or most of these 36 “inventions” rest upon the scientific genius of Aboriginal communities. The burden of proof must be on those seeking exclusive monopoly to show that they have truly taken an inventive and non-obvious step in staking their claim.

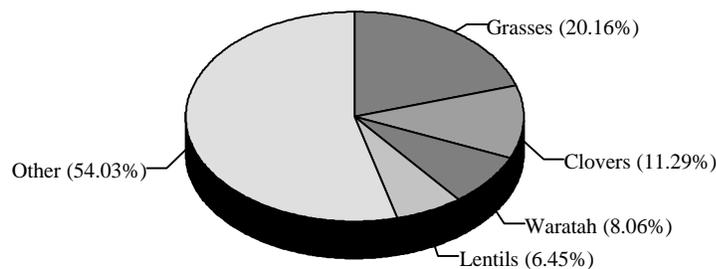
A classic example of this situation is the beach plant called 'Muntries' or 'Muntari' (*Kunzea pomifera*, an Australian native). The fruit of this plant was used as a food and a trade item by Aboriginal communities in South Australia and parts of Western Victoria. Some botanists suggest it was also spread and transplanted by Aborigines. Europeans learned to eat the fruit from Aborigines in the years after settlement. The company Australian Native Produce Industries obtained provisional rights to this variety under the name "Rivoli Bay" on February 22, 1996 (AU 96/026). But there has been no description or published report since then. This is an abuse of the provisional privilege and appears to be a failure by the PBRO. As a result Aboriginal communities in Australia might well wonder if the firm undertook genuine plant breeding or merely submitted a farmers variety.

Suspect origin: In many instances, the origin of the plant germplasm is not clear. Indeed, the term “country of origin” seems to be almost always deceptive if the purpose is to identify the geographic point at which a farmers’ variety was first developed. In many areas, such as in the highlands of the Andes or the lake district of central Africa, true scientific attribution of the “country of origin” of a specific variety or valued genetic trait is both difficult and irrelevant since farmers in such regions depend heavily upon one another for a relatively free flow of plant germplasm. The attribution of any single variety or gene to any single country or community is a denial of the local seed exchange system - and a threat to future exchange. Very often, the same variety or trait could have been collected from any number of countries or communities within a region and the appropriation of the material by any single person or community is an affront to the whole region.

The designation of “country of origin” by a possible pirate may only indicate that the material came from a “safe” country (with whom the collector has an agreement) as opposed to other countries in which collections took place without agreement. Further, some collectors are habitually incapable of remembering where a specific sample was collected when the expedition involved several countries or a region such as the Mediterranean.

An example of the confusion could be the “Aldinga” lentil (HSCA/RAFI-125) which appears to have been provided to the State of Victoria (Australia) by ICARDA. “Aldinga” is a selection from ICARDA-IG-5750

Plant Kinds
Most Commonly Claimed Plant Kinds



whose parents are Ethiopian and either Mexican or Italian. The parents are both part of the FAO Trust. While there is no PBR claim attached to this variety, VIDA (Victorian Institute for Dryland Agriculture) appears to have given exclusive license for the variety to the Australian Field Crops Association. Who (if anyone) should take umbrage? Ethiopia and/or Mexico and/or Italy? Should the international community defend its access to “Aldinga” through the FAO Trust?

Species: Overall, forage species dominate the ranks of the non-indigenous Australian claims under study. With its large sheep and cattle industry, Australian stockmen are on the look-out for new grasses and legumes that can survive in the Aussie Outback. Brazil, East Africa, and the Middle East are all proven germplasm reservoirs for such species. Leading the hit parade are an assortment of 25 grasses, 14 clovers, and 8 lentils. Ornamental and flower varieties are well represented with ten Waratahs (genus *Telopia*, a native rainforest species). In all, eighty plant kinds are included in Table 5.

It must be noted that many of the forage and ornamental species identified in this inquiry are self-pollinating and can easily be selected from populations. Thus, individual plants could be multiplied and the best sample could then be submitted as reasonably-stable “bred” varieties.

Other than forage species, the most common target for potential abuse are ornamental species. Because of the extensive care given to ornamentals, such plants lend themselves to wide distribution in homes or gardens around the world. It is not surprising that the exotic flora of Australia or southern Africa are targets for this kind of piracy.

The Case of the Specious Species Claim “Good as Gold” Bad as PBR

Some PBR claims are more ‘unkind’ than others. HSCA-RAFI-70 (AU 95/199), for instance, was awaiting certification in Australia since August, 1995. It was “accepted” for provisional protection less than two weeks after the original application but the claim languished at the PBRO until June 19th this year, when it was issued. The problem? No one could identify the plant kind (or species). The applicant, Redlands Nursery thought they were submitting a species of Homalomena, a Chinese ornamental and medicinal plant. PBRO disagreed and the Queensland botanical garden couldn’t decide what the plant was. There are numerous species of Homalomena and hundreds of varieties of the popular ornamental can be found in homes. Finally, a sample of the mysterious plant was packed off to Kew Gardens for more expert advice. On June 19th, however, the PBRO grew tired of waiting for word from Kew and decided to issue the certificate without the species being known. The plant could not be trialed against appropriate germplasm to prove its distinctness. Now the burden of proof is reversed. To challenge the certificate, HSCA will have to prove that a plant of an unconfirmed species is not unique! This decision, coming a week after 118 governments contemplated the Australian PBR scandal in Rome, shows the continuing indifference of Australian authorities to international concern. If no one can name the species, the plant itself does have a name “Good as Gold” - proving once again that he who has the gold rules!

Prey

A Summary of the 43+ Countries (and seven Centres) that may have been Abused

Countries: Among the countries whose farmers may have been abused by plant pirates are 14 states in Latin America (from Mexico and Cuba south to Argentina and Chile); China, India, Pakistan and Bangladesh in Asia; 10 states in sub-Saharan Africa (from Ethiopia to the Cape); and seven states of West Asia and North Africa (WANA - from Morocco to Syria). European farmers are also fair prey. Seven (mostly Mediterranean) countries, beginning with Bulgaria in the East and moving across to Portugal on the Atlantic, are all targets.

Table 1: Public Prey

IARC	No. of Claims	% of IARC claims
AVRDC	1	4%
CIAT	2	7%
CIMMYT	4	14%
ICARDA	12	44%
ICRISAT	3	11%
IITA	1	4%
IRRI	4	11%
TOTAL	27	100% (rounded)

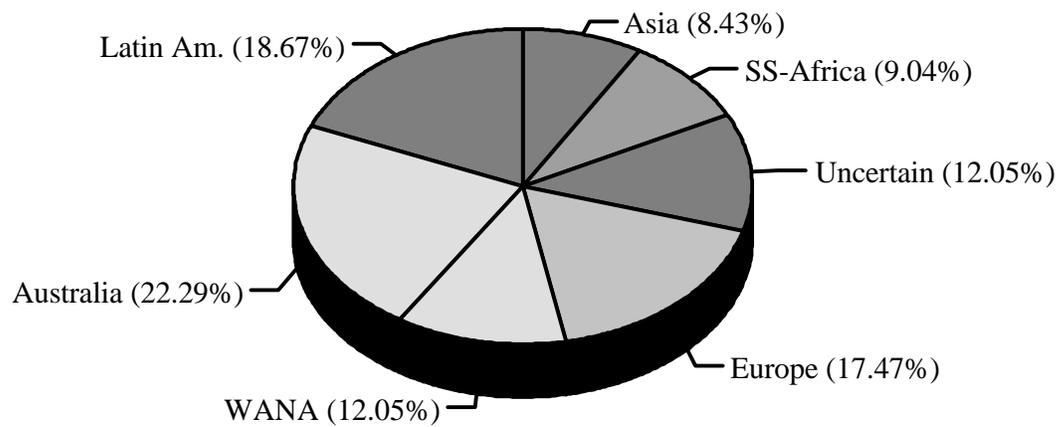
Some countries appear to host both predators and prey. Spain, Italy, and possibly France seem to have had Mediterranean material usurped and have also laid claim to farmers' varieties from the South or from the CGIAR's International Agricultural Research Centres. South Africa may be especially disadvantaged in that some local plants appear to be claimed elsewhere while one or more industrialized countries have applied for PBR protection for dubious varieties in South Africa.

Centres: Other than Australia itself, the most frequent prey are International Agricultural Research Centres. Six of the institutes of the Consultative Group on International Agricultural Research (CGIAR) may be targets. A seventh centre, the Asian Vegetable Research Development Centre (AVRDC) though not a CGIAR centre, is also singled out. Of the 27 IARC plant accessions which may be improperly claimed, the majority appear to be part of the 1994 FAO-CGIAR Trust Agreement. ICRISAT and ICARDA have already succeeded in forcing the withdrawal of five Australian claims involving CLIMA (Centre for Legumes in Mediterranean Agriculture). It remains to be seen whether all of the IARCs will pursue all of the claims under the terms of new protocol decisions

adopted at a CGIAR meeting in Brasilia in May, 1998.

Popular Prey

Number of Possible Abuses by Region



UPOV's Generation Hex: For preyed-upon States wondering if the piracies will ever end, a representative of UPOV has offered some words of solace. At a June meeting of the FAO Commission (CGRFA) in Rome, a lunch-time seminar was organized in the FAO building for concerned governments to discuss the Australian scandal. Officials from FAO and CGIAR reported on their proposal for a voluntary moratorium and governments received information from RAFI and HSCA on the latest developments. Sadly, Australia's diplomats to the FAO meeting were not allowed by their government to attend the briefing.

When participants learned that the inquiry had spread from Australia to include the USA, New Zealand, Israel, Italy, South Africa, and Spain, the UPOV official present volunteered his own opinion from the floor. He advised governments that such problems were likely to occur when breeders in tropical and semi-tropical countries "such as Australia, New Zealand, Israel, and South Africa" were working with tropical plants for which there is little commercial breeding experience. The UPOV staffer concluded the good news however, is that once breeders have access to enough germplasm and enough experience, they will adopt more conventional breeding practices. The next generation of breeders, he suggested, would not have to resort to the kind of tactics being debated in the room. In other words, countries being pirated could look forward to better conditions after commercial breeders had all the germplasm they needed and had used this to develop conventional commercial varieties. Many in the lunch session were astonished that a UPOV representative could be so sanguine about ongoing biopiracy. To date, UPOV has not offered any formal comment or advice on the scandal and has not proposed any solutions to the problem nor even accepted any responsibility for seeking solutions.

Table 2: The Pirated

Countries and regions identified as the source of plant varieties claimed by others (where the applicant has provided information).

Country/ Region	# of claims	UPOV status		Country/ Region	# of claims	UPOV status
<i>Africa</i>	1			Jordan	1	
Algeria	2			Lebanon	1	
Argentina	1	UPOV'78		Kenya	2	Application
Australia*	37	UPOV'78		Mediterranean	1	
Bangladesh	1			Mexico	9	UPOV'78
Belarus	1	Application		Morocco	4	Application
Bolivia	1	Application		Mozambique	1	
Botswana	1			Nigeria	1	
Brazil	4	Application		Pakistan	5	
Bulgaria	1	UPOV'91		Panama	1	Application
Chile	2	UPOV'78		Peru	2	
China	2	Application		Poland	1	UPOV'78
Colombia	1	UPOV'78		Portugal	4	UPOV'78
Cuba	1			South Africa*	2	UPOV'91
Ecuador	4	UPOV'78		<i>South Asia</i>	1	
El Salvador	1			Syria	5	
Ethiopia	2			Tanzania	2	
<i>Europe</i>	5			Turkey	5	
France	1	UPOV'91		Uganda	1	
Greece	2			Uruguay	1	UPOV'78
Guatemala	2			Venezuela	1	Application
India	5			Zambia	1	
Iran	2			Zimbabwe	1	Nat'l. PBR
Italy*	14	UPOV'91		<i>Uncertain</i>	19	

*indicates a State that may also be accepting inappropriate claims from others

Predators

The Seven Countries Accepting Dubious Intellectual Property Claims

Breeders from industrialized countries have long maintained that they have little commercial interest in plant varieties from the South. In 1994, however, RAFI reported that the annual value of germplasm flows from South to North through the CGIAR alone, was in the order of \$4-5 billion (please see RAFI Occasional Paper, V.1, #.3: *Declaring the Benefit*, Oct., 1994). It must be pointed out, of course, that this value is not realized by the plant breeder, nor the seed company, nor the farmer - but by the overall society. Bilateral germplasm flows (between Zimbabwe and Australia, for example) would also be significant. Interestingly, the institutions that may have involvement with abusive intellectual property claims are primarily from the public sector and from Australia. As has already been noted, however, Australia's predominance in this study is at least partly due to the thoroughness of the *Australian Plant Varieties Journal*. The exceptional level of public institute involvement may also be explained, in part, by the tendency of university and government researchers to volunteer more varietal information than their commercial counterparts.

Countries:

Australia: *Of the seven countries studied, it is clear that Australia is the only state whose abuses are so pervasive as to describe the state itself as a predator.* Agricultural economists in Australia place a very high value on that country's access to CGIAR germplasm. Local estimates suggest that CIMMYT wheat contributes not less than \$126 million to the national economy for example. In this study, 115 of the 147 claims considered originate in Australia. The extent of the involvement of Australian Government and other publicly-funded institutions is quite amazing. With the single exception of the Northern Territory, every state government is linked to possible PBR abuses. Breeding institutes in Brisbane, Queensland (28); in Canberra, ACT (20); Perth, Western Australia (19); and in New South Wales (12), dominate but breeders in Adelaide, South Australia (9); Victoria (2); Tasmania (2) are also identified.

Universities are also evident. Most prominent among the Australian set are the Universities of New England and Sydney University in New South Wales, Adelaide University in South Australia, the University of Queensland, and the University of Western Australia. Well-known public agencies such as CSIRO, CLIMA, and GRDC are also involved. Some apparently private companies are also actually held by public bodies. Luminis Pty. Ltd., for example, is a subsidiary of Adelaide University.

United States: Running a distant second to Australia is the United States with 11 identified claims. The major activity appears to be centred around rice varieties under patent and/or PBR claim via the University of California or RiceTec Inc. (in the case of basmati-like rice). Responding to intense pressure from Andean farmers and CSOs, Colorado State University has dropped its claim to a quinoa variety that implicated more than 40 traditional Andean varieties. The University of Nebraska has claimed a contentious buffalo grass variety for which it received provisional PBR status some time ago. Private breeders in the United States have come under scrutiny for a number of varieties of coloured cotton, a teff variety clearly taken from Ethiopian farmers, and a cowpea originally crossed at IITA in Africa. RAFI's research into the use of CIMMYT wheat

germplasm in the USA suggests that CIMMYT's annual contribution to the U.S. agricultural economy is not less than \$3 billion (a CGIAR study places the value at \$14 billion since 1970). U.S. Cabinet officials have placed the value of foreign maize and soybean germplasm at \$10.2 billion per annum. RAFI has estimated that the value of rice germplasm from IRRI is about \$655 million per annum (the same CGIAR study suggests a low \$1 billion since 1960). Bean material from CIAT has been valued at \$60 million a year in the U.S.

New Zealand: Right behind the USA, New Zealand has 10 possibly abusive claims. Most of the institutes involved appear to be public or semi-public and include the New Zealand Institute for Crop and Food Research Ltd., the New Zealand AgResearch Grasslands Centre at Palmerston North; and the New Zealand Pastoral Research Institute as well as the New Zealand Department of Scientific and Industrial Research (DSIR). Quite reasonably, New Zealand's interests are less Mediterranean. In terms of plant kinds, the uncertain claims include lentils, garden peas, durum wheat, and grasses. According to national researchers, New Zealand receives at least \$500,000 a year in benefits from CIMMYT's wheat research. The country only recently became a member of the CGIAR.

South Africa: Seven plants have come to the South African PBR Office for acceptance. All of the applications originate with Australian institutes and all involve Persian or subterranean clovers except one faba bean. Most of the applicants come from Western or South Australia or Victoria. One of the varieties appears to be an FAO-ICARDA Trust accession that would otherwise be readily available to South African farmers through ICARDA without royalty charges.

Israel: The Volcani Centre in Israel may have placed a CIMMYT durum wheat under PBR claim some years ago. The PBR claim has since expired.

Indeed, two CIMMYT durums ("Inbar" and "Hazera") have been grown in Israel.

Italy: The Italian institute ENEA also appears to have laid claim to a CIMMYT triticale variety in 1987. Italy also relies increasingly on CIMMYT for durum wheat for pasta. An Italian agency estimated that the annual value of CIMMYT's durum research to Italy is not less than \$300 million.

Spain: The Spanish institute Semilla Fito appears to have claimed a CIMMYT triticale variety in 1989. The variety may also have been grown under another name in France. Spain commercialized CIMMYT's Manigero triticale variety in 1979. The country has also allowed the marketing of CIMMYT's "Mexa" and "Nuna" durum wheats.

Table 3: The Predators
Countries whose PBR/patent offices have accepted dubious claims

Country	No. of claims	UPOV Membership Status
Australia*	111	UPOV'78
Israel	2	UPOV'91
Italy*	2	UPOV'91
New Zealand	9	UPOV'91
South Africa*	7	UPOV'91
Spain*	1	UPOV'91
USA	11	UPOV'91

*Country may also be prey to others. Count excludes five cases of questionable licenses.

Public Privateers:

With the exception of a number of ornamental plants, the vast majority of possibly-abusive claims come from the public sector. Although several universities are implicated, the leading participants are closely allied to national or state (provincial) ministries of agriculture. Two pressures may be at play here. First, public breeders now feel themselves to be an endangered species. Research budgets are declining and government interest is evaporating. Under these conditions, breeders are scrambling to demonstrate "value-added" benefits to the national economy and, less-so, to farmers. Some public breeders are prepared to cut corners. Second, public institutions are less sensitive than their private counterparts to the new political environment surrounding sovereignty over crop germplasm or the prevailing protocols involving intellectual property. On the one hand, this encourages them to take genetic material without thought of sovereign or Farmers' Rights and, on the other hand, to apply for PBR or patents on any material they consider remotely commercial.

The Kleptocracy: Australia's Absurdly Abusive Abusers

Australia's reactions to the unfolding scandal is a study in unembarrassed denial. Although RAFI contacted Australian authorities about the first group of improper claims in December, 1997 the first response from the breeders - in this case CLIMA - came only on January 13th (following RAFI's original news release of January 6th).

The communication, from CLIMA Director John Hamblin, didn't go to RAFI but to Rahul Goswami, a reporter with Mid-day Publications in India. Hamblin attacked RAFI saying that the CSO's presentation of the issue "can only be considered to be incorrect, impolite and irresponsible." Hamblin went on to provide a point-by-point rebuttal to RAFI's accusation that CLIMA, together with other parties in Western Australia, was claiming Plant Breeders Rights on two ICRISAT chickpea varieties without permission and in violation of CLIMA's Material Transfer Agreement with ICRISAT. The CLIMA official also denied that the two varieties (named "Heera" and "Sona" by the Aussies - Hindi/Urdu words meaning "Diamond" and "Gold" respectively) would be sold in South Asia and the Middle East. Advertising brochures sent to RAFI, however, specifically noted that the two names would be familiar in their primary export market for Australian companies. RAFI's press release, according to Hamblin, called into question RAFI's credibility and intentions.

Seven days after this letter, RAFI issued a second news release on the subject reporting that CLIMA had suddenly reversed course and capitulated to ICRISAT's demand that it abandon the claims. ICRISAT confirmed every detail of RAFI's accusations. There was no formal comment from CLIMA. In its January 21st release, RAFI went onto identify three other varieties claimed by CLIMA that were held in trust by ICARDA. CLIMA persisted in saying that it had the legal right to apply for Plant Breeders Rights for the germplasm. FAO's legal department, CGIAR, and RAFI disagreed. Some weeks later (RAFI was never given the exact date) the varieties were quietly abandoned.

Throughout the first half of 1998, Bill Hankin of HSCA was astonished to find that several Australian breeding institutions he contacted were willing, albeit reluctantly, to admit that they had abused the PBR system and participated in biopiracy. They were also willing to acknowledge that changes needed to be made to prevent continuing abuses. Without exception, however, they were not willing to give up their monopolies on pirated varieties where the certificates had already been issued. Other Australian agronomists working outside the country noted the same phenomena. Almost without exception, breeders and institute directors recognized that PBR abuses were widespread and that they represented a "failure in ethics". They were not willing to make amends for the past - only to consider adjustments to their modus operandi in the future.

Until this attitude changes, the revelations will continue and the good reputations of the majority of Australian scientists will be sullied by Australia's silent minority of intellectual kleptomaniacs.

Problems

The Major Regulatory Failures in the Australian Experience

The detailed information available through the Australian PBRO makes it possible to classify the presumed failures in the regulatory system into four major groups. Beyond these four are a handful of other problems found both inside and outside intellectual property that deserve attention. Not all of these cases are confined to Australia.

Most Common Abusive Practices:

NPB: First among the Australian cases is that the applicant offers *no proof of plant breeding* (NPB in Table 5). In over one-third of all the Australian cases, the *Plant Varieties Rights Journal* of the PBRO provides no evidence of breeding activity and there is so far no other indication that actual breeding took place. This is in contradiction to the Australian legislation.²

A good example of the problem is HSCA/RAFI 5/6 “Nitro Plus” (AU 97/035), a Persian clover collected in Syria. Western Australia’s government applied for PBR rights in February of 1997 and it was accepted five weeks later. PBR rights are also being sought in South Africa. There is no evidence of plant breeding in either country. This clover is also a good “bad example” of gene bank data management. The data for this variety changed during our inquiry and we can only conclude that there are no credible passport data available from the claimant.

In the same vein, there is also HSCA/RAFI-22 “Casbah” (AU 96/120) of which, CLIMA, its ‘inventor’ says, “We searched the desolate fields of Morocco to find this peculiar plant thriving in the poorest of conditions”. Yet the record shows that “Casbah” is synonymous with the accession, MOR99 (Agriculture Western Australia’s genebank mistakenly calls it ‘MAR 99’). There is no indication of plant breeding. The Moroccan plant was ultimately licensed to Paramount Seed.

NOTAGS: The second most common Australian failure is that the PBRO did not require that the applicant test the variety against the germplasm source (NOTAGS in Table 5). In these cases, the so-called breeder collected plants (usually from other countries) and then tested the candidate material - not against the original plants - but against varieties of the same species of common knowledge in Australia. Since one of the universal criteria for Plant Breeders’ Rights under UPOV is “distinctness” (sometimes described as the requirement for “absolute world novelty” in patent regimes), it is essential that an importer be obliged to prove that her/his new variety is not merely the regenerated progeny of plants taken from farmers’ fields abroad. It stands to reason that a traditional lentil variety collected from a farmer in Syria will be “distinct” from commercial lentils genuinely bred in Australia. Unless PBR offices are rigorous in testing against source germplasm, biopirates have a license to steal and monopolize the work of others. This, too, violates the Australian legislation.³

One of the most remarkable examples of NOTAGS (and NPB) indeed, one of the most poignant examples in the entire study, is highlighted in the following box.

The Case of
Leucaena leucocephala (Jumbie Bean)
Tarramba

Australia's PBR applicants seem to have a real problem making a distinction between actual breeding and mere collection. Consider the case of Tarramba, HSCA/RAFI-40, (AU 95/027) certified in Australia at the end of 1997. The variety was collected in 1979 in Saltillo, Coahuila (Mexico) by the University of Hawaii. Tarramba is synonymous with Hawaii's accession K636, Tarramba was commercialized (without PBR) in Hawaii before certification in Australia. Colin Hughes, a Leucaena expert at Oxford, says that K636 and Tarramba are the same. It appears that Max Shelton, the agronomist (not plant breeder) at the University of Queensland, who pressed for PBR, only undertook an evaluation of the sample.

Indeed, the Queenslander appears to confirm this. In one co-authored academic report, Sheldon states that Tarramba is K636. In another communication, the agronomist expressed his regret that the Aussie legislation spoke of "Breeders Rights" rather than "Variety Rights" since most forage research depends on sample evaluation rather than breeding. Meanwhile, Tarramba is the property of Uniquest in Australia and is licensed to Leucseeds which according to one source, sold about 7000 kilos of the breeding material at \$40 a kilo in 1997.

Hughes says that the real genius behind Tarramba and other Leucaenas from Mexico and Central America are the indigenous peoples who have nurtured and bred them for millennia as a minor food source. The species is important in the past and present cultural and economic life of its home region where "Oaxaca" (a region in Mexico) roughly translates as "the place where the jumbie bean grows".

During the course of this inquiry Queensland University refused to sign a Material Transfer Agreement (MTA) with Oxford that would have allowed Queensland to receive breeding material from the UK. The MTA has only three provisions: that the recipient not apply for intellectual property on the germplasm; that third parties be instructed to do the same; that the recipient attempt to prevent the plant's spread as a weed. What exactly is the problem here? HSCA is now arranging to re-test Tarramba in Australia.

PROBUSE: Ranking number three on the administrative failures list is the tendency in the Australian PBRO to grant provisional protection to an applicant for a plant variety pending the submission of additional information or trial data. This is provided for under Australia's PBR Act of 1994. As in many UPOV member states, Australia's process has four steps. In the first step, the breeder applies for protection. In the second step, the regulatory agency either accepts or rejects the application for further examination. If accepted, the PBRO grants "provisional protection" and permits the applicant to treat the candidate variety as though it were already approved. The breeder can often license or sell the plant as though she or he had an exclusive monopoly over it. In the third step, the variety is trialed by growing it out and comparing it to other varieties. Finally, in the fourth step, the claim is either approved or rejected. There are at least a dozen instances in Australia (see PROBUSE in Table 3) where provisional approval was granted in the second stage several years ago. In these instances, there appears to be no movement toward a full and final evaluation of the candidate plant. This administrative abuse of the Australian law makes it possible for a plant pirate to monopolize a variety that does not meet UPOV standards and could even be the work of others.⁴

A case in point is "Waite Crimson" (AU 92/172) accepted provisionally by the Aussie PBRO in 1992 and still benefitting from PBR monopoly after six years of inactivity. The variety is being marketed by Luminis Pty. Ltd. owned by the University of Adelaide. "Waite Crimson" is a selection of a native Banksia from Southwestern Australia. Banksia's are prize cut flower and popular ornamental in Australia. In addition to appearing to abuse its provisional status, the applicants offered no evidence of plant breeding.

PREPBR: Finally, at least six of the Australian claims significantly pre-date the passage of their PBR law and, under the terms of the legislation should not have been allowed.

One possible example of this problem is HSCA/RAFI-23, a Creeping Bluegrass called "Bisset" (AU 90/021) collected on an apparent expedition to Kenya and Tanzania in 1972, although the PBR certificate was applied for in 1990. There is no indication of plant breeding. The variety is held by the Queensland Department of Primary Industry in Australia.

Multiple concerns: Obviously, many of the varieties cited here and also appearing in Table 5 could suffer from a number of abuses. HSCA/RAFI 43 "Rivoli" (AU 91/046), a disk alfalfa (lucerne) originally collected by Australian hunters in Morocco in the mid-seventies is just another such example. Not only did the purported breeding work take place prior to the Australian PBR legislation but the variety was only tested against one domestic counterpart and not against the original material.

Other Abusive Practices:

Non-Patent "Licenses": Possibly the most peculiar of all the 147 examples are those that do not directly involve patent or PBR claims. In a few instances, public bodies appear to have obtained varieties from IARCs and then assumed pseudo-proprietorship over the material to the extent of granting licenses to others for commercialization. These cases are the embodiment of the "natural right" attitude of some public privateers over germplasm for which they have no right.

Two possible examples of this abuse can be mentioned. First are three lentil varieties from ICARDA identified as "Matilda", "Cobber", and "Digger" (HSCA/RAFI numbers 122, 123, 124 respectively) all provided upon request to the Victorian Institute for Dryland Agriculture (VIDA) and without development then "exclusively licenced" by VIDA to The Lentil Company of Horsham, Victoria. In each instance, the company thought it was receiving exclusive licenses to grow, harvest, and market the varieties. In a second case, the New Zealand Crop and Field Research Association has appeared to licence a red lentil named "Rajah" (HSCA/RAFI -62) based upon FAO-ICARDA Trust germplasm. The license has gone to Peter Cates Ltd. Again, there is nothing to suggest that VIDA or the New Zealand association have any legal right to award licenses.

Expropriation: As already noted with respect to instances in Israel, Italy, Spain, USA, and New Zealand, it appears that PBRO offices have permitted local breeders to lay claim to plant varieties even where the public record clearly shows the

Problem	%
NPB (No Proof of Breeding)	37%
NOTAGS (Not Tried Against Germplasm Source)	29%
PROBUSE (Abuse of Provisional Protection)	10%
PREPBR (Variety Predates PBR)	5%
Misc./Multiple Errors	19%

varieties to have been bred by others. An equally blatant variation on this theme is offered by CLIMA (the Western Australia agency) which proceeded with PBR claims on germplasm held in Trust with FAO even though their MTA (Material Transfer Agreement) with ICRISAT explicitly denied them this possibility and, further, despite additional warning that such claims were unacceptable.

The study also received information from breeders in Australia to suggest that certain varieties developed in France were being prepared for PBR claim in Australia without the permission of the French breeders. This is clearly an actionable case and we are presently attempting to substantiate the details and to make this information public if and when wrongful applications

are filed.

Policies

(or 147 Reasons Not To Join UPOV and WIPO)

Civil Society Organizations and governments can work together locally and internationally to put an end to crop biopiracy. The following are 21 specific proposals for action on six fronts, based upon this study.

National Policies:

Prey: National governments must bear in mind that the germplasm in dispute may either not be of national origin (or

breeding) or may be shared with a number of other countries. Policy-makers should give careful consideration to the provisions and ongoing negotiations surrounding the Convention on Biological Diversity and the revision of the FAO Undertaking on Plant Genetic Resources before taking action. Nevertheless, as the country of collection, the government has grounds to take action. On a bilateral basis (with the predator-hosting states), governments might consider at least four initiatives.

1. **Retract:** Contact the predator-hosting government whose offices have accepted a possibly-abusive intellectual property claim (either the Minister of Agriculture or the Minister responsible for intellectual property protection) requesting that the offending claim be abandoned or reviewed;
2. **Repay:** Request that the holder of an inappropriate claim surrender all revenues acquired through their claim to either the country of germplasm collection (where this is undisputed) or to the FAO Commission on Genetic Resources for Food and Agriculture (CGRFA) to be held in trust for the general benefit of the international community until a common fund is created through the renegotiation of the FAO International Undertaking on Plant Genetic Resources;
2. **Repatriate:** Require that the original germplasm as well as its duplicates and derivatives be repatriated to the country of collection and/or surrendered to a gene bank where the material will be held in trust under the auspices of FAO;
3. **Repent:** Request that the rights-granting office in the country undertake a full review of its procedures to determine how the abuse occurred and how future abuses can be prevented;
4. **Rewrite:** National gene banks should rewrite their Material Transfer Agreements (MTAs) to ensure that they comply with the FAO-CGIAR Trust Agreement and prevent recipients of bank germplasm from laying claim to germplasm covered by that Agreement and/or taken from farmers' fields without notable plant breeding;

In addition, governments could also support a wide range of multilateral initiatives as outlined below.

Predator: States made aware that their intellectual property laws have been abused should also consider a range of national initiatives.

6. **Respond:** Governments should pro-actively revisit the abuse cases identified in this paper and elsewhere to determine whether or not violations have occurred. Governments should also initiate contact with the country of collection to elicit advice and information. If an abuse has taken place, the government should be instructed by the country of origin (including the four points noted above);
7. **Review:** Governments should pro-actively review their legislation and regulations as well as the catalogue of plant varieties (and germplasm) claims to ensure that other abuses have not occurred. The practice of not accepting public comment on a variety unless accompanied by fee payments is not conducive to transparency or good governance and must be eliminated.
8. **Respect:** Governments should enact legislation to establish an ombudsman's office able to respond to specific requests or concerns from other governments or farming communities with respect to past or present intellectual property claims. This office should have the necessary resources to review cases and to take legal action on behalf of farmers or other governments when abuses are suspected;

Governments should also support the multilateral initiatives described below.

International Centre Policies:

During the course of this research and as specific CG-related cases became known, we were in close contact with a number of International Centres and with the CGIAR overall. In general, the CG System's response to the situation was highly-commendable. Special mention can be made of the professionalism and dedication of the System-wide Genetic Resources Programme (SGRP); the International Plant Genetic Resources Institute (IPGRI); ICRISAT; and the Chair of the CGIAR. Farmers, governments, and the international germplasm community were well-served by each of these parties.

By contrast, centres such as ICARDA and CIAT have only responded under intense pressure from their colleagues and from the international community. Although ICARDA did finally bring its MTA into alignment with the FAO-CGIAR Trust, it took the Centre many months to come to grips with issues that were well-appreciated much earlier by its sister centres and other partners. At best, CIAT's response to specific queries and cases has been lethargic and inconclusive.

Most surprising to us has been the sheer passivity of most of the CG Centres when specific cases have been raised. It has rarely been sufficient to advise Centres that there might be an abuse of their agreement with FAO to ensure that action will be taken. In most instances, Centres had to be led by the hand to investigate possible abuses and told exactly where to look and how to respond. Following initial contact, we generally had to go back to Centre officials on several additional occasions in order to receive promised follow-through. It was seldom clear whether officials were too embarrassed to investigate, too busy, or merely suffering from SADS (Scientist Attention-Deficit Syndrome). There continue to be a number of cases where Centre information is missing, ambiguous, or both.

The passivity of the System does not bode well for its capacity to manage ever-more complicated arrangements involving commercial research institutes and intellectual property protocols. With impressive exceptions, international public bodies such as the CGIAR do not demonstrate the energy and attentiveness necessary to defend either farmers or themselves against unscrupulous adversaries. It was shocking for us to find examples where a breeder felt entitled to claim exclusive monopoly over a CGIAR variety merely on the basis of having written away for seed. Indeed in conversation with some breeders, there seems to be a belief that because their government gives some financial support to the CGIAR, it is the God-given right of that country's breeders to purloin varieties developed by the CGIAR.

The theory (though obviously not the practice) behind UPOV's Plant Breeders' Rights system is that breeders are encouraged to breed - not to pirate. It is likely that abuses of CIMMYT's breeding programmes are so evident only because of CIMMYT's superior record-keeping and monitoring of the use of its varieties. Similar problems must be presumed to arise for other CG Centres. It is also disturbing that CG Centres have not taken steps to halt the appropriation of their varieties. In discussion with some Centres, scientists have suggested that they have no objection to a country applying for PBR certification on Centre varieties so long as the monopoly is confined to a single country. We disagree.

First, one institution is obtaining monopoly benefits from the publicly-funded work of another institution. This material could and should be available to farmers everywhere without monopoly control. If national government mechanisms make this difficult, the governments should smarten up. It's not the duty of agricultural ministries to guarantee monopoly profits for pirates, it is their duty to ensure that the national food production system - farmers - have access to the best available breeding material.

A second objection is that in more than one instance, the institute obtaining rights to a CGIAR variety at home has also

applied for PBR certification abroad. Even the most benevolent (and beguiled) public breeder should find such an abuse unacceptable. For its part, CGIAR's task is to alleviate poverty - not fill the pockets of errant breeders,

One of the more blatant instances of this possible abuse is HSCA/RAFI-131, the "Waitohi" durum wheat bred at CIMMYT and put under PBR certification in New Zealand in 1993 (NZ#754) by the New Zealand Institute for Crop and Food Research Ltd. Although it is abundantly clear that the New Zealanders did nothing to breed this variety, it is not certain that the durum germplasm is part of the FAO Trust Agreement since the durum genebank is at ICARDA in Syria - not at CIMMYT.

Passive or Active Voice?

The case of HSCA/RAFI-131, "Waitohi" durum wheat (NZ#754) offers an example of both motivational and database difficulties in the CGIAR. The variety was bred at CIMMYT and placed under apparent PBR claim in New Zealand. When RAFI approached CIMMYT for details, the Centre promptly produced a computer print-out of the pedigree showing that it was bred by CIMMYT. CIMMYT, however, was not concerned that New Zealand had laid claim to the variety. Asked whether the breeding lines used in the variety were under Trust with FAO, CIMMYT replied that durum wheat germplasm was ICARDA's responsibility - not theirs. Since CIMMYT showed no enthusiasm for following through with ICARDA, RAFI eventually contacted the Syrian-based Centre and asked them if the parent lines in the durum were held in Trust with FAO. ICARDA responded saying they had no way of knowing since the variety had been bred at CIMMYT and not ICARDA. RAFI then explained to ICARDA that the IWIS CD-ROM database on bread and durum wheats published by CIMMYT carried the pedigree data and that ICARDA need only match that data with its list of accessions appended to the FAO agreement. Shortly thereafter, and with appropriate embarrassment, ICARDA reported that they had conducted the search and did not believe that the durum parent lines were part of its arrangement with FAO.

Neither RAFI nor HSCA are convinced. It is difficult to understand, for example, why the parent material would have been excluded from the Trust Agreement. Further, there are sufficient persistent irregularities in ICARDA's database management that a more scrupulous search by outside parties might be warranted.

Finally, CGIAR's internal policies regarding Trust germplasm may not cover instances like this where neither the breeder (CIMMYT) or the genebanker (ICARDA) appear eager to defend the public interest.

A more complicated example is HSCA/RAFI-15/16, the faba bean "Icarus" obtained from CGIAR's ICARDA but originally from Ecuador where it had been bred and nurtured by farmers there. "Icarus" wound its way to Australia where it was granted PBR certification in 1995 as AU 92/007. The variety is now the "property" of the University of Adelaide and Luminis Pty. Ltd. Its owners are also seeking PBR certification for "Icarus" in South Africa where it goes by the code RSA PT-1544. "Icarus" is also part of the FAO-ICARDA Trust Agreement.

Despite these concerns and shortcomings, we must conclude that the CGIAR has responded rather well to an extremely difficult situation. At the CGIAR Mid-Term Review held in Brasilia in May, 1998, Centre Directors developed - and CG members supported - a common MTA and a detailed procedure for addressing possible abuses. This leaves us with only three recommendations:

9. **Report:** Each CG Centre should review each of the cases in this study which may involve their institute. The Centre should provide a public report on each case and take whatever action then appears appropriate to defend their agreement with FAO and their responsibilities to farmers and national partners;

10. **Reassure:** Centres should adopt a common policy covering board and staff conflict-of-interest situations with respect to germplasm exchange and development. Specifically, Centre staff members should not sit on the boards of other institutes receiving germplasm from the Centre. Staff should also not be permitted to take a cross that has been made by the Centre and then apply for PBR certification on the cross after leaving the Centre. Both of these situations have occurred. It is vitally important that Centres reassure their partners that staff and board are being held to the highest standards of ethical behavior;
11. **Relate:** The SGRP should be supported in its efforts to strengthen the electronic databases for CG genebanks (SINGER) and CG breeding material (ICIS). Improvements in SINGER's complicated internal nomenclature (especially cross-referencing of duplicate accessions and synonymous accession names) and the thorough but difficult interface would increase its usability and enhance access to information on the CG's germplasm transfers. SGRP's efforts to integrate horizontally with other relevant databases like the U.S. Department of Agriculture's GRIN system should be supported. (See also recommendation #17 - "Relinquish".)

There is an opportunity to discuss these issues at the time of the CGIAR's International Centres' Week in Washington from October 26-30, 1998.

FAO Policies:

FAO too, acted swiftly and professionally in addressing the possible abuses of its agreement with CGIAR. Predators and Centres were left in no doubt as to the obligations of the Trust Agreement and the provisions of the Biodiversity Convention. Following the lead of the Chair of the CGIAR, FAO also called for a voluntary moratorium on intellectual property claims involving Trust germplasm. The call clearly had an impact on a number of governments.

Nevertheless, the "Australian" case did also reveal problems. FAO lacks the staff and resources to monitor the Trust Agreement and it does not have procedures in place that make it easy for staff to respond to possible abuses or to advise governments. The following recommendations are in order:

12. **Require:** FAO should develop explicit procedures to be followed when possible abuses are reported. These procedures should be approved by governments in the FAO Commission on Genetic Resources for Food and Agriculture (CGRFA). These procedures should include provision (and financial support) for any legal action that might be necessary to defend the FAO Trust germplasm;
13. **Remind:** The CGRFA should receive regular reports (at each of its meetings) on the status of the FAO-CGIAR Trust including information on any complaints of possible abuses that have been brought to FAO's attention;

FAO should work closely with CGIAR and other parties in developing its procedures and in coordinating electronic databases. This issue would be appropriate for discussion at the next FAO Council session in Rome from November 23-28, 1998 and possibly, at the next meeting of the FAO Commission (CGRFA) expected in early 1999.

WIPO/UPOV Policies:

The intergovernmental conventions concerning intellectual property rights are governed through the World Intellectual Property Organization (WIPO). The Director-General of WIPO is also the Secretary-General of UPOV (Union for the Protection of New Varieties of Plants) and both bodies occupy the same address in Geneva. Membership in WIPO or UPOV

seems to confer the privilege to pirate but without protection from piracy (countries like Italy, of course, find themselves standing uneasily at both ends of the gangplank).

We note that throughout our inquiry and despite considerable media and intergovernmental attention to this issue, neither UPOV nor WIPO have approached us for information. To the best of our knowledge, these two guardians of intellectual property integrity have remained aloof and silent on a matter that concerns them greatly.

Yet all but eight of the 147 cases reviewed are of the Plant Breeders' Rights type propagated by UPOV. Three are patents more related to the work of WIPO, and five are cases of involving licensing. Fully 22 of the 43+ "preyed-upon" countries are either members of one of UPOV's two international conventions (14 States) or are said by UPOV to be considering membership. At present, UPOV's Conventions have a combined total of 37 member governments (including 2 states adhering to the early 1961 and 1972 accords, 28 adhering to the 1978 agreement, and seven members of the 1991 text). Clearly, the abused members could and should have a lot to say about UPOV's failure to protect their farmers when the UN body's governing council meets this October 28th in Geneva. Still more effectively, governments should be addressing these issues at the WIPO Assembly in Geneva from September 14-28, 1998.

Concerned governments could pursue a number of initiatives at WIPO and UPOV:

14. **Resolve:** Governments can introduce resolutions within the WIPO and UPOV governing bodies requiring a full inquiry into the procedures and practices at the international level that have made biopiracy possible, with a view to developing implementable recommendations that would make future abuses less likely;
15. **Request:** Member states could introduce a resolution within WIPO that would seek an Advisory Opinion from the International Court of Justice on the potential predatory nature of current western models of intellectual property protection that inevitably prey upon, and usurp the knowledge of plant varieties held by farming and other traditional communities;
16. **Recommend:** Within WIPO and UPOV, governments could call for the formation of "ombudsman" units capable of seeking, receiving, and acting upon possible abusive claims as identified by the units or as brought forward by national governments, or farming or other traditional communities with the ability to challenge and reverse claims and to award compensation;
17. **Relinquish:** To facilitate germplasm tracking and abuse detection, governments could encourage the further development of publically-accessible databases that link detailed germplasm information and plant variety descriptions at the national level with an improved, public database at WIPO and UPOV. In turn, this may be electronically cross-referenced with the CG's SINGER. Governments should require UPOV to improve its poor efforts to make protected plant variety information available (UPOV-ROM). UPOV's CD-ROM is incomplete, exorbitantly priced, and so poorly-detailed that it is seldom worth consulting. UPOV should address this problem by increasing the quality and level of detail of its information and by making the results internet-accessible;
18. **Refer:** Governments, through WIPO and UPOV, should ensure that the WTO's TRIPs Review in 1999 includes full consideration of the implications of plant biopiracy through intellectual property regimes;

WTO - TRIPs Policies:

The review of WTO TRIPs Article 27.3(b) is ultimately the most important forum for halting predatory practices. Although the negotiating process and the review timetable are not yet known, it is slated to begin some time in 1999. The TRIPs Council will meet in Geneva on September 17-18 and again in December. These meetings offer an initial opportunity for concerned governments to make their views known.

19. **Rescind:** During the 1999 WTO TRIPs Review, governments should agree to remove the current requirement, under Article 27.3(b), to permit intellectual property protection for plants and for microorganisms on the grounds that WIPO and UPOV regimes are predatory upon the knowledge of farming communities and indigenous peoples and upon that sovereignty of states over their living resources;
20. **Re-draft:** Only if the above initiative fails should governments consider (within the framework of the WTO TRIPs Review) calling for an amendment to Article 27.2 in order to broaden the right to exclude intellectual property claims that are contrary to public morality or threaten the environment. The amendment should make it possible to exclude an entire category, such as plant varieties, on the grounds that current regimes are inherently predatory and that piracy is counter to public morality. In addition however, the amendment should make it clear that it is the protection that offends public morality, and not necessarily the variety which should be available for use within the country. The clause that should be re-negotiated is cited below...

27.2 Members may exclude from patentability invention... to protect order public or morality, including to protect human, animal, or plant life or health or to avoid serious prejudice to the environment, provided that the exclusion is not made merely because the exploitation is prohibited by their law.

Farmer Policies:

Both national and international action is needed in order to defend the rights of farming communities. At the international level, Farmers' Rights are entrenched within the FAO International Undertaking on Plant Genetic Resources. However, the Undertaking is presently being revised to become a legally-binding protocol compatible with the Biodiversity Convention. The FAO Commission will next meet to negotiate the Undertaking in December, 1998 in Rome.

21. **Rights:** Farmers and governments should work closely together to implement Farmers' Rights including the inalienable right of farming communities to save, exchange, and develop plant varieties without restriction. Governments should also press for the implementation of Farmers' Rights within the revision of the International Undertaking on Plant Genetic Resources at FAO and through the Human Rights Commission's review of the Right to Food.

Table 5. Plant Breeders Rights and "Wrongs"? (follows)

Endnotes

1. Please see, for example, **RAFI Communique**, (July/August, 1996). "Pharmaceutical Companies Bid for Northern Botanical Garden Collections in Attempt to Avoid the Biodiversity Convention" at RAFI's website (<http://www.rafi.org/communique>) and **Development Dialogue** (1998) "The Parts of Life" in Chapter 5. "First Parts" and Chapter 7, "Private Parts". This text is also available at the RAFI website: http://www.rafi.org/publications/dev_dialog.html.

2. In the 1987 Plant Varieties Act, Section 5 on page 4, States: "Nothing in this Act requires or Permits the grant of plant variety rights in respect of a new plant variety unless....the origination of that new plant variety constituted an invention for the purposes of Paragraph 51 (XVIII) of the Constitution." In the Plant Breeders Rights Act of 1994, Section 10 states: "Nothing in this Act requires or permits the granting of PBR in a plant variety ...unless...the breeding of the plant variety constitutes an invention.."

3. The same sections outlined above, apply as with NPB. Trialing against source germplasm is the only way to determine if a variety is an 'invention'.

4. The PBR Act of 1994 permits sales after application but before the Grant is made while still Provisional. However to prevent abuses, a limit is placed on the time allowed after an application is accepted by the Office. Section 34 states : " (1) As soon as practicable after, **but not later than 12 months after, an application has been accepted, or within such further period as the Secretary allows for the purpose, the applicant must, if the applicant has not already done so, give the Secretary a detailed description of the plant variety to which the application relates. (2) If the applicant fails to give the Secretary the detailed description required under this section within the required period, the application is taken to have been withdrawn. " Extensions of time are at the discretion of the PBRO Secretary. There are two *Banksia* applications that have now been on the books for 6 and 4 years.

PLANT BREEDERS RIGHTS - AND WRONGS

INTELLECTUAL PROPERTY CLAIMS (GRANTED & PENDING), AND EXCLUSIVE LICENSES ON PLANT VARIETIES UNDER HSCA AND RAFI INVESTIGATION

ACRONYMS

AVRDC - ASIAN VEGETABLE RESEARCH AND DEVELOPMENT CENTRE, TAIWAN
CIAT - INTERNATIONAL CENTRE FOR TROPICAL AGRICULTURE, COLOMBIA
CIMMYT - INTERNATIONAL MAIZE AND WHEAT IMPROVEMENT CENTRE, MEXICO
CLIMA - CENTRE FOR LEGUMES IN MEDITERRANEAN AGRICULTURE, AUSTRALIA
CSIRO - COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANIZATION, AUSTRALIA
FAO - UN FOOD AND AGRICULTURE ORGANIZATION, ITALY
GRDC - GRAINS RESEARCH AND DEVELOPMENT CORPORATION, AUSTRALIA
ICRISAT - INTERNATIONAL CROPS RESEARCH INSTITUTE FOR THE SEMI-ARID TROPICS, INDIA
IITA - INTERNATIONAL INSTITUTE FOR TROPICAL AGRICULTURE, NIGERIA
ICARDA - INTERNATIONAL CENTRE FOR AGRICULTURAL RESEARCH IN THE DRY AREAS, SYRIA
IRRI - INTERNATIONAL RICE RESEARCH INSTITUTE, PHILIPPINES
NZ DSIR - DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH, NEW ZEALAND
QDPI - QUEENSLAND DEPARTMENT OF PRIMARY INDUSTRIES, AUSTRALIA
SINGER - SYSTEM-WIDE INFORMATION NETWORK FOR GENETIC RESOURCES OF THE CGIAR
VIDA - VICTORIAN INSTITUTE FOR DRYLAND AGRICULTURE, AUSTRALIA

COMMENTS ABBREVIATIONS

NOTAGS	NOT TRIALLED AGAINST GERMPLASM SOURCE
NPB	NO PROOF OF BREEDING
PROBUSE	ABUSE OF PROVISIONAL PROTECTION
PREPBR	VARIETY PREDATES PBR
NAME OF AUSTRALIAN STATE ALONE IN APPLICANT COLUMN	INDICATES A GOVERNMENTAL AGENCY OF THE RESPECTIVE STATE

KIND & NAME:	CLAIM(S), DATES, ALT. NAMES:	APPLICANT / FAO:	COMMENTS:
HSCA/RAFI-1/2 TRIFOLIUM PRATENSE RED CLOVER ASTRED	APPLICATION (AU): 12/5/90 AU 90/120 GRANTED 2/2/93; NZ #1018 GRANTED 22/8/95	TASMANIA WRIGHTSON SEEDS	PORTUGAL. THIS CULTIVAR IS BASED ON 243 PLANTS SELECTED FROM A BULK POPULATION. THE ORIGINAL PLANTS WERE GROWN FROM SEED COLLECTED IN PORTUGAL & SEED FROM THESE PLANTS WAS USED IN MERIT TESTING EXPERIMENTS TO ESTABLISH AGRONOMIC VALUE NOTAGS
HSCA/RAFI-3/4 TRIFOLIUM RESUPINATUM PERSIAN CLOVER KYAMBRO	APPLICATION (AU): 01/3/89 AU 89/014 GRANTED 19/1/90; RSA ZA 92794 GRANTED 11/6/92	SOUTH AUSTRALIA	TURKEY. COLLECTED BY G.M. HALLORAN NEAR OSMANIYE, TURKEY IN 1975. AKA S.A. 12239 SELECTED IN 1982. NPB

HSCA/RAFI-5/6 TRIFOLIUM RESUPINATUM PERSIAN CLOVER NITRO PLUS	APPLICATION (AU): 19/2/97 AU 97/035 ACCEPTED 14/3/97 RSA PT-2170 ACCEPTED 3/3/97	WESTERN AUSTRALIA	SYRIA. AGRICULTURE WESTERN AUSTRALIA GENE BANK HAS NO REAL PASSPORT DATA. NPB.
HSCA/RAFI-7/8 TRIFOLIUM RESUPINATUM PERSIAN CLOVER PERSIAN PROLIFIC	APPLICATION (AU): 19/2/97 AU 97/036 ACCEPTED 14/3/97 RSA PT-2171 ACCEPTED 3/3/97	WESTERN AUSTRALIA	TURKEY. COLLECTED ON A ROADSIDE 9KM NORTH OF MENEMEN. AGRICULTURE WESTERN AUSTRALIA GENE BANK HAS NO REAL PASSPORT DATA. NPB.
HSCA/RAFI-9/10 TRIFOLIUM SUBTERRANEUM SUBCLOVER DENMARK	APPLICATION (AU): 21/10/91 AU 91/101 GRANTED 23/7/93; RSA PT-2235 ACCEPTED 16/6/97	WESTERN AUSTRALIA	ITALY (SARDINIA). COLLECTED 11 KM NORTH OF FLUMINIMAGGIORE BY FRANCIS & GILLESPIE. CPI 89830F BROUGHT TO AUSTRALIA AS PART OF THE NATIONAL SUBCLOVER IMPROVEMENT PROGRAM IN 82. NPB. PREPBR.
HSCA/RAFI-11/12 TRIFOLIUM SUBTERRANEUM SUBCLOVER LEURA	APPLICATION (AU): 25/1/91 AU 91/015 GRANTED 2/11/92 RSA PT-2174 ACCEPTED 3/3/97	DARATECH PTY LTD (VICTORIA)	ITALY (SARDINIA). SELECTED AFTER EVALUATION OF LATE SEASON BREEDING LINES COLLECTED BY COLLINS, GLADSTONEA & NICHOLS OVER 82-89. NPB. INADEQUATE DATA FOR PBR EVALUATION. COMMERCIALIZATION VIA WRIGHTSON SEEDS AUSTRALIA.
HSCA/RAFI-13/14 TRIFOLIUM SUBTERRANEUM SUBCLOVER YORK	APPLICATION (AU): 23/10/93 AU 93/234 GRANTED 14/03/96; RSA PT-2173 ACCEPTED 3/03/97	WESTERN AUSTRALIA	ITALY. COLLECTED IN SARDINIA BY C.M. FRANCIS & D.J. GILLESPIE IN JUNE 1977, ON THE ROADSIDE 3 KM NORTH OF OLPIA, NPB. COMMERCIALIZATION VIA SOUTH AUSTRALIAN SEEDGROWERS COOPERATIVE LTD.
HSCA/RAFI-15/16 VICIA FABA FABA BEAN ICARUS	APPLICATION (AU): 29/1/92 AU 92/007, GRANTED 28/8/95 RSA PT-1544, ACCEPTED 5/4/94	LUMINIS PTY LTD, (ADELAIDE UNIV.) FAO TRUST (ICARDA)	ICARDA. A RESELECTION OF ICARDA-IG-102469 ITSELF A SELECTION OF ICARDA-IG-11632 AN ECUADOREAN FARMERS' VARIETY PASSED THROUGH A COLOMBIAN GENE BANK. ALSO MARKETED BY SEEDCO.
HSCA/RAFI-17 AESCHYNOMENE AMERICANA AMERICAN JOINTVETCH LEE	APPLICATION (AU): 17/8/92 AU 92/126, GRANTED 30/11/95	QUEENSLAND FAO TRUST (CIAT)	CIAT. ACCESSION CIATFOR-7026. COLLECTED IN RIO SERENO, CHIRIQUI, PANAMA IN 1978. ARRIVED AT CSIRO IN 1981 VIA USA. NOTAGS. NPB.
HSCA/RAFI-18 AESCHYNOMENE VILLOSA HAIRY JOINTVETCH KRETSCHMER	APPLICATION (AU): 2/9/96 AU 96/193 ACCEPTED 4/9/96	QUEENSLAND	MEXICO. US#PI-546929 AKA CPI 93621 COLLECTED BY UNIV. OF FLORIDA ON 1/04/80 'OFF HWY 140 TO PINOLTEPEC, VERACRUZ'
HSCA/RAFI-19/20 ARACHIS HYPOGAEA PEANUT SHOSH	IL #771 GRANTED 30/8/90 APPLICATION (AU): 24/11/94 AU 94/225, GRANTED 16/12/97	ISRAELI MINISTRY OF AGRICULTURE	UNCERTAIN. SELECTION LINE 110 FROM GAINSVILLE FLORIDA USA. TRIALLED AGAINST SHULAMIT & NC-7. PBR GRANTED IN USA (1995).
HSCA/RAFI-21 ARACHIS PINTOI PINTO PEANUT AMARILLO	APPLICATION (AU): 3/10/89 AU 89/086 GRANTED 14/08/90 AKA MANI FORRAGERO PERENNE(SPAN.), AMENDOIM FORRGEIRO PERENE(PORT.)	CSIRO QUEENSLAND FAO TRUST (CIAT)	BRAZIL / CIAT. COLLECTED IN 1954 BY BRAZILIAN SCIENTIST G.C.P. PINTO (FOR WHOM THE SPECIES IS NAMED). IN BRAZIL. SYNONYMS INCLUDE: CPI-058113; PI-338314; BRA-013251; ILCA-10920; IRFL-6911; GK-12787. SHOULD BE CALLED "AMARELO", PBR APPLICANT USED SPANISH WORD FOR "YELLOW" BY ACCIDENT. NPB.

HSCA/RAFI-22 BISERRULA PELEGINUS CASBAH	APPLICATION (AU): 17/06/96 AU 96/120, ACCEPTED 25/06/96	CLIMA	MOROCCO. 'WE SEARCHED THE DESOLATE FIELDS OF MOROCCO TO FIND THIS PECULIAR PLANT THRIVING IN THE POOREST OF CONDITIONS' SAYS CLIMA. SYNONYMOUS WITH MOR99. AGRICULTURE WESTERN AUSTRALIA GENE BANK CALLS IT 'MAR 99'. LICENSED TO PARAMOUNT SEED. COLLECTION & EVALUATION OF ECOTYPES NEAR OEUDE ZEM, MOROCCO BY BEALE, LAHLOU & BOUNEJIMATE IN 1988.
HSCA/RAFI-23 BOTHRIODCHLOA INSCULPTA CREeping BLUEGRASS BISSET	APPLICATION (AU): 5/02/90 AU 90/021 GRANTED 6/02/91	QUEENSLAND	KENYA AND/OR TANZANIA. ACCORDING TO QDPI PUBLICATIONS, BISSET WAS INTRODUCED FROM KENYA & TANZANIA IN 1972. PREPBR.
HSCA/RAFI-24 CENCHRUS CILIARIS BUFFEL GRASS BELLA	APPLICATION (AU): 28/07/93 AU 93/164 GRANTED 24/11/94	CSIRO QUEENSLAND	TANZANIA (LUBAGA). SELECTED FOR 2 GENERATIONS. SELECTED FROM 326 ACCESSIONS IN WORLD COLLECTION OVER 89-93. BELLA BEST YIELDING. CPI 48280
HSCA/RAFI-25 CENCHRUS CILIARIS BUFFEL GRASS VIVA	APPLICATION (AU): 28/07/93 AU 93/165 GRANTED 24/11/94	CSIRO QUEENSLAND	UGANDA OR KENYA (MOROTO?). SELECTED FOR 2 GENERATIONS. CPI 33100
HSCA/RAFI-26 CICER ARIETINUM DESI CHICKPEA HEERA	APPLICATION (AU): 7/05/97 AU 97/092	WESTERN AUSTRALIA & GRDC FAO TRUST (ICRISAT)	ICRISAT. SYNONYMOUS WITH ICC-14880. INDIAN FARMERS' VARIETY FROM ANDRA PRADESH. CLIMA REPORTS LICENSED TO SGB AUSTRALIA. APPLICATION WITHDRAWN
HSCA/RAFI-27 CICER ARIETINUM DESI CHICKPEA SONA	APPLICATION (AU): 7/05/97 AU 97/095	WESTERN AUSTRALIA & GRDC FAO TRUST (ICRISAT)	ICRISAT. SYNONYMOUS WITH ICCV-88202, DERIVED FROM AN IRANIAN FARMERS' VARIETY CLIMA REPORTS LICENSED TO AGRACORP PTY APPLICATION WITHDRAWN
HSCA/RAFI-28 DESMANTHUS VIRGATUS WILD TANTAN MARC	APPLICATION (AU): 23/04/92 AU 92/062 29/11/95	QUEENSLAND	ARGENTINA. CPI 78373 CSIRO'S PRESS RELEASE MENTIONS NO BREEDING... NPB. "THE RELEASE OF DESMANTHUS COMES AFTER MANY YEARS OF CSIRO & QUEENSLAND RESEARCH LOOKING FOR A PERSISTENT SUMMER GROWING LEGUME FOR LONG-TERM PASTURES ON TROPICAL SOIL." COMMERCIALIZATION VIA WRIGHTSON SEEDS (NZ)
HSCA/RAFI-29 DESMANTHUS VIRGATUS WILD TANTAN BAYAMO	APPLICATION (AU): 23/4/92 AU 92/063 29/11/95	QUEENSLAND	CUBA. SEE MARC. CPI 82285. NPB. COMMERCIALIZED BY WRIGHTSON SEEDS (NZ)
HSCA/RAFI-30 DESMANTHUS VIRGATUS WILD TANTAN UMAN	APPLICATION (AU): 23/4/92 AU 92/064, GRANTED 30/11/95	QUEENSLAND	MEXICO (YUCATAN). SEE MARC. CPI 92803. NPB. COMMERCIALIZED BY WRIGHTSON SEEDS (NZ)
HSCA/RAFI-31 DIGITARIA MILAJIANA DIAZ BLUESTEM STRICKLAND	APPLICATION (AU): 19/4/95 AU 95/113, GRANTED 27/6/96	CSIRO QUEENSLAND	BOTSWANA. A RECURRENT SELECTION FROM PI 299792 COLLECTED NEAR LAKE N'GAMI, BY USDA. NOTAGS. CPI 40700
HSCA/RAFI-32 DICHANTHUM ANNULATUM BLUE GRASS FLOREN	APPLICATION (AU): 24/3/95 AU 95/113, GRANTED 30/9/97	CSIRO QUEENSLAND	SOUTH ASIA. CPI 106374

HSCA/RAFI-33 ECHINOLOA FRUMENTACEA BILLION DOLLAR GRASS INDUS	APPLICATION (AU): 29/11/93 AU 93/248, GRANTED 17/08/95 AKA SAWAHIRSE, INDIAN BARNYARD MILLET	CSIRO QUEENSLAND	PAKISTAN. ORIGINAL SEED WAS BOUGHT IN A DERA ISMAIL KHAN MARKET IN 1954. AKA CPI 108621 & US PI -219608. PREPBR
HSCA/RAFI-34 FESTUCA ARUNDACINACEA TALL FESCUE BOMBINA	APPLICATION (AU): 10/6/94 AU 94/134 GRANTED 21/03/97	PASTURE WISE IAN ABERDEEN	MEDITERRANEAN. ISOLATED POLY-CROSS OF ELITE PLANTS FROM BREEDERS REFERENCE FESCUE 596: ORIGINAL MEDITERRANEAN MATERIAL OBTAINED FROM USDA.
HSCA/RAFI-35 LAB LAB PURPUREUS LAB LAB BEAN KOALA	APPLICATION (AU): 9/1/95 AU 95/002 GRANTED 12/12/96	NEW SOUTH WALES	FRANCE. SELECTION FROM INTRODUCTION FROM STATION D'AMELIORATION DES PLANATES, FRANCE BY QDPI IN 1962. BRED FOR ABILITY TO GROW & SET SEED IN COOLER AREAS. COMPARITORS BOTH COMMONLY KNOWN TROPICAL - AS OPPOSED TO TEMPERATE - VARIETIES. IF THE ORIGINAL LINE CAME FROM FRANCE IT WAS PROBABLY A SHORT SEASON TYPE. PREPBR.
HSCA/RAFI-36 LATHYRUS CICERA FLATPOD PEAVINE CANOPUS	APPLICATION (AU): 7/10/97 AU 97/254	CLIMA - GRDC FAO TRUST (ICARDA)	ICARDA. SYNONYMOUS WITH IFLA-1279. COLLECTED BY ICARDA IN SYRIA IN 1988. CG NUMBER: ICARDA-IG-65998. TRANSFERRED TO VIDA IN 04/93. APPLICATION WITHDRAWN
HSCA/RAFI-37 LENS CULINARIS RED LENTIL NORTHFIELD	APPLICATION (AU): 24/01/95 AU 95/034 ACCEPTED 31/01/95	SOUTH AUSTRALIA FAO TRUST (ICARDA)	ICARDA. SELECTED FROM ILL-5588. FROM JORDAN . SINGER'S ONLY RECORD OF TRANSFER TO AUSTRALIA WAS TO CLIMA IN JAN. 96. RESISTANCE TO SEED BLEMISHES GIVE NORTHFIELD ADVANTAGE OVER OTHER AUSTRALIAN VARIETIES. TO BE MARKETED BY AUSTRALIAN FIELD CROPS ASSOCIATION.
HSCA/RAFI-38 LENS CULINARIS RED LENTIL CASSAB	APPLICATION (AU): 28/05/97 AU 97/116 ACCEPTED 8/08/97	WESTERN AUSTRALIA - CLIMA FAO TRUST (ICARDA)	ICARDA. ICARDA-IG-75919 (AKA ILL-7200). PROVIDED TO NZ INST. OF CROP & FOOD RESEARCH IN 10/95. & MAY HAVE BEEN TRANSFERRED IN CLIMA/ICARDA VISIT. CLIMA DATA SUGGESTS EITHER PAKISTAN OR BANGLADESH ORIGIN. APPLICATION WITHDRAWN
HSCA/RAFI-39 LENS CULINARIS LENTIL CUMRA	APPLICATION (AU): 28/05/97 AU 97/115 ACCEPTED 8/08/97	WESTERN AUSTRALIA - CLIMA FAO TRUST (ICARDA)	ICARDA SYNONYMOUS WITH LEN29610 CUMRA IS A CITY IN TURKEY. CLIMA STARTED IN '96 ON A COLLECTION PROGRAM IN TURKEY & GREECE. CLIMA OBTAINED 45 TURKISH LENTILS FROM ICARDA. APPLICATION WITHDRAWN
HSCA/RAFI-40 LEUCAENA LEUCOCEPHALA JUMBIE BEAN TARRAMBA	APPLICATION (AU): 22/02/95 AU 95/027, GRANTED 9/12/97 AKA HUAXIN OR GUAJE (SPANISH/MEXICO) IPIL-IPIL (TAGALOG)	UNIQUEST LTD.	MEXICO. COLLECTED IN 1979 IN SALTILLO, COAHUILA BY UNIV. OF HAWAII. SYNONYMOUS WITH HAWAII'S ACCESSION K636. ACCORDING TO ONE OF THE PBR OWNERS "L. LEUCOCEPHALA CV. TARAMBA WAS COLLECTED FROM 1000 M ABOVE SEA LEVEL AND AT A RELATIVELY NORTHERLY LATITUDE IN MEXICO." NOT BRED, MAY NOT EVEN HAVE BEEN SELECTED AT ALL. IMPORTANT SPECIES IN MEXICO, OAXACA ROUGHLY TRANSLATES AS "THE PLACE WHERE HUAXIN GROWS." AUSTRALIAN COMMERCIALIZATION BY LEUCSEEDS PTY LTD. COMMERCIALIZED IN HAWAII IN USA WITHOUT PBR AND APPARENTLY PRIOR TO PBR GRANT IN AUSTRALIA. NPB. NOTAGS.

HSCA/RAFI-41 LUPINUS ALBUS LUPIN LAGO AZZURRO	APPLICATION (AU): 24/03/95 AU 95/112, ACCEPTED 4/04/95	MT GAMBIER PROPERTY TRUST	ITALY. SINGLE PLANT SELECTION FROM IMPORTED ITALIAN "WILD" LUPIN. SELECTED FOR LARGE UNIFORM SEED TYPE. NOTAGS.
HSCA/RAFI-42 LUPINUS LUTEUS YELLOW LUPIN WODJIL	APPLICATION (AU): 8/05/97 AU 97/093, ACCEPTED 13/05/97	WESTERN AUSTRALIA & GRDC	POLAND. TEO-105, POLISH CULTIVAR. SINGLE PLANT SELECTION. SINGLE PLANT SELECTION OF TEO-105, A POLISH CULTIVAR. TEO'S PARENTS ARE A PORTUGUESE 'WILD VARIETY' AND A FARMERS' VARIETY FROM BELARUS. "THE BREEDER OF TEO IS DR WIKTOR SWIECICKI OF POZNAN PLANT BREEDERS, POLAND." COMMERCIALIZATION BY AGWA & GRDC. NOT BRED BY PBR APPLICANT. NPB
HSCA/RAFI-43 MEDICAGO TORNATA MEDIC, DISK RIVOLI	APPLICATION (AU): 19/04/91 AU 91/046, GRANTED 7/10/92	SOUTH AUSTRALIA	MOROCCO. NEAR KINITRA. 'RIVOLI' WAS COLLECTED IN 1974, & SINCE 1983 HAS BEEN IN LEGUME TRIALS. THE ORIGINAL SEED SOURCE IS NOT STATED IN THE PVR REPORT. PREPBR. TRIAL ONLY INVOLVED 1 COMPARATOR "TORNAFIEL" AKA S.A. 9490 NOTAGS.
HSCA/RAFI-44 MEDICAGO SPHAEROCARPOS MEDIC, SPHERE ORION	APPLICATION (AU): 22/03/94 AU 94/074, ACCEPTED 23/03/94	WESTERN AUSTRALIA	ITALY. WAS COLLECTED IN SICILY IN 1986 BY W. COLLINS OF AGWA & E. PIANO & S. PUSCEDDU OF ISTITUTO SPERIMENTALE PER LE CULTURE FORAGGERE, CAGLIARI, SARDINIA.
HSCA/RAFI-45 ORNITHOPUS COMPRESSUS YELLOW SERRADELLA CHARANO	APPLICATION (AU): 15/08/97 AU 97/176, ACCEPTED 1/09/97	WESTERN AUSTRALIA - CLIMA	GREECE. SYNONYMOUS WITH 87GEH56. COLLECTED ON THE SOUTH EDGE OF MYCONOS TOWN LICENSED TO AT LEAST 4 GROWERS
HSCA/RAFI-46 ORNITHOPUS COMPRESSUS YELLOW SERRADELLA SANTORINI	APPLICATION (AU): 26/03/96 AU 96/047, ACCEPTED 28/03/96	WESTERN AUSTRALIA	GREECE. SYNONYMOUS WITH 87GEH76C. COLLECTED IN 87 FROM THE NORTH EAST COAST OF THE GREEK ISLAND OF SANTORINI. BEING TENDERED BY CLIMA
HSCA/RAFI-47 ORNITHOPUS SATIVUS PINK SERRADELLA CADIZ	APPLICATION (AU): 19/02/96 AU 96/019, ACCEPTED 20/02/96 (FORMERLY FLAMINGO)	WESTERN AUSTRALIA - CLIMA	SOUTH AFRICA "THE PINK SERRADELLA CULTIVAR FLAMINGO WAS EVALUATED AS 90ZAF5 AFTER BEING COLLECTED BY MR DENNIS GILLESPIE IN SOUTH AFRICA CLIMA, 95 REPORT. MAY ORIGINALLY BE FROM ELSEWHERE. 60 LICENSES, ONE FOR EXPORT .
HSCA/RAFI-48 PASPALUM NOTATUM BAHIA GRASS RIBA	APPLICATION (AU): 27/6/94 AU 94/151 GRANTED 6/03/96	NEW SOUTH WALES	URUGUAY. POSSIBLY FROM NATURAL GRASSLANDS IN URUGUAY. NOTAGS. CPI 23944
HSCA/RAFI-49 PENNISETUM GLAUCUM PEARL MILLET SIROMILL	APPLICATION (AU): 24/04/95 AU 95/139, GRANTED 17/06/96	CSIRO QUEENSLAND FAO TRUST (ICRISAT)	ICRISAT. SELECTED FROM ZAMBIAN FARMERS' VARIETY HELD BY ICRISAT. ICRISAT HAS 156 PEARL MILLET ACCESSIONS FROM ZAMBIA. 154 ARE FAO TRUST. ISOLATED OPEN POLLINATED SEED. (AKA CPI 114994A) NOTAGS

HSCA/RAFI-50/51 PISUM SATIVUM GARDEN PEA TROUNDCE	NZ #564 GRANTED 20/5/91 APPLICATION (AU): 8/09/95 AU 95/217, ACCEPTED 12/09/95	NZ CROP & FOOD RESEARCH LTD	Uncertain. SELECTED FROM FIELD CROP OF SMALL SIEVE FREEZER (SSF) PEAS GROWING AT DEVONPORT TAS IN 1987. SINGLE PLANT THROUGH 4 GENERATIONS. SELECTED TO RESIST POWDERY MILDEW. TRIALLED AGAINST BOUNTY & SSF. PEAS ARE SELF-POLLINATING SO THE POWDERY MILDEW RESISTANCE CHARACTERISTIC HAD TO BE A DOUBLE RECESSIVE. TROUNDCE'S CHARACTERISTICS ARE MARKEDLY DIFFERENT FROM THE PURPORTED PARENT SUCH AS SEED WRINKLING , MEAN SEED WEIGHT, MEAN NUMBER OF SEEDS PER PLANT, TOTAL NUMBER OF PODS, AND THE NUMBER OF LEAFLETS AT FIRST FERTILE NODE . THAT ALL THIS HAPPENED IN THE FIELD IS EXTREMELY IMPROBABLE ACCORDING TO BOTANIST AND PEA EXPERT DR. DAVID MURRAY. TROUNDCE SEEMS TO HAVE THE CHARACTERISTICS OF A COMPLETELY DIFFERENT VARIETY THAN SSF. YET TROUNDCE IS REPORTED TO BE A NATURAL SELF-POLLINATED SELECTION FROM SSF. PBR PROVISIONALLY GRANTED IN SEPTEMBER 1997.
HSCA/RAFI-52 STYLOSANTHES HAMATA CARIBBEAN STYLO AMIGA	APPLICATION (AU): 20/07/90 AU 90/078, GRANTED 18/12/91	CSIRO QUEENSLAND	VENEZUELA. COLLECTED IN 1991 NEAR MARACAIBO. 1983 SELECTION. AKA CPI 55822
HSCA/RAFI-53 STYLOSANTHES SCABRA SHRUBBY STYLO RECIFE	APPLICATION (AU): 29/10/90 AU 90/113, GRANTED 30/10/91	CSIRO QUEENSLAND	BRAZIL. DERIVED FROM SINGLE PLANT SELECTION OF SECCA. NPB
HSCA/RAFI-54 STYLOSANTHES SCABRA SHRUBBY STYLO PRIMAR	APPLICATION (AU): 12/08/96 AU 96/160, GRANTED 20/06/97 AKA CAATINGA STYLO	CSIRO QUEENSLAND	BRAZIL (SERRO). CPI 92838B. APPARENTLY ACCEPTED ON BASIS OF PLOIDY. NPB.
HSCA/RAFI-55 STYLOSANTHES SCABRA SHRUBBY STYLO UNIVCA	APPLICATION (AU): 12/08/96 AU 96/161 GRANTED 2/06/97 AKA CAATINGA STYLO	CSIRO QUEENSLAND	BRAZIL (ANDARAI). CPI 110361. APPARENTLY ACCEPTED ON BASIS OF PLOIDY. NPB.
HSCA/RAFI-56 TRIFOLIUM INCARNATUM CRIMSON CLOVER CAPRERA	APPLICATION (AU): 1/08/97 AU 97/172, NOT YET ACCEPTED	CLIMA - GRDC	ITALY. POSSIBLY VIA CNR UNIV. OF SASSARI, SARDINIA. CAPRERA IS A SMALL ISLAND OFF SARDINIA & THE EX-HOME OF GARIBALDI, AGRICULTURE WESTERN AUSTRALIA GENE BANK HAS NO PASSPORT DATA. BEING TENDERED BY CLIMA
HSCA/RAFI-57 TRIFOLIUM SUBTERRANEUM SUBCLOVER GOULBURN	APPLICATION (AU): 21/10/91 AU 91/102, GRANTED 23/07/93	WESTERN AUSTRALIA	ITALY. COLLECTED BY FRANCIS & GILLESPIE 13KM NORTH OF LUOGOSANTO, SARDINIA IN 1982. CPI 89830F
HSCA/RAFI-58 TRIFOLIUM VESICULOSUM ARROWLEAF CLOVER CEFALU	APPLICATION (AU): 30/06/97 AU 97/149, ACCEPTED 7/07/97	CLIMA - GRDC	UNCERTAIN, PROBABLY ITALY. (CNR) CEFALU IS SICILIAN CITY. TENDERED BY CLIMA

HSCA/RAFI-59 UROCHLOA MOSAMBICENSIS SABI GRASS SARAJI	APPLICATION (AU): 13/03/97 AU 97/052, GRANTED 19/12/97	CSIRO QUEENSLAND	MOZAMBIQUE. CPI 601128. SELECTED BY J.B. HACKER FROM A RANGE OF UROCHLOA ACCESSIONS. NOTAGS. NAMED FOR AUSTRALIAN COAL MINE. COMMERCIALIZED VIA PROGRESSIVE SEEDS.
HSCA/RAFI-60 VICIA ERVILIA BITTER VETCH CAZAR	APPLICATION (AU): 4/10/96 AU 96/202, ACCEPTED 23/01/97	CLIMA - GRDC FAO TRUST? (ICARDA)	UNCERTAIN, PROBABLY MOROCCO. CLIMA COLLECTED IN MOROCCO & SPAIN IN PAST 3.5 YEARS ICARDA SENT 218 ACCESSIONS. SELECTED FROM ATC-60396 AKA RL12004 FAMINE FOOD IN MOROCCO. LICENSED TO SEEDCO.
HSCA/RAFI-61 VIGNA RADIATA MUNG BEAN EMERALD	APPLICATION (AU): 16/10/92 AU 92/165, GRANTED 31/05/94	CSIRO QUEENSLAND	AVRDC. 2 GENERATION SELECTION OF AVRDC VC2735A, A BREEDING LINE LIKELY TO HAVE CHINESE PARENTAGE. ORIGINAL CROSS MADE BY AVRDC IN 1978. HAS MAJORITY OF AUSTRALIAN MUNGBEAN SEED MARKET. NOT BRED BY IPR CLAIMANT.
HSCA/RAFI-62 LENS CULINARIS RED LENTIL RAJAH	NO PBR BUT EXCLUSIVE LICENSE IN NZ	PETER CATES, LTD. VIA NZ CROP & FIELD RESEARCH LTD. FAO TRUST (ICARDA)	ICARDA. RAJAH IS ILL-6243 (FLIP 87- 53 L), CROS S BETW EEN ICARDA-IG-4400 (ILL-4400), A SYRIAN FARMERS' VARIETY & ICARDA-IG-703 (ILL 703; II-3-113; DREBNA), A BULGARIAN VARIETY. RAJAH IS MARKETED EXCLUSIVELY IN NZ BY PETER CATES SEED LTD (ASHBURTON).
HSCA/RAFI-63 APIUM PROSTRATUM SEA CELERY SOUTHERN OCEAN	APPLICATION (AU): 22/2/96 AU 96/026 ACCEPTED 27/5/96	AUSTRALIAN NATIVE PRODUCE INDUSTRIES PTY	AUSTRALIA A NATIVE SPECIES. FOUND ALONG SALINE COASTAL AREAS, RARELY INLAND, USED BY CAPTAIN COOK'S PARTY AS A SUBSTITUTE FOR CELERY IN 1770'S. USED BY SETTLERS TO PREVENT SCURVY. PROBUSE.
HSCA/RAFI-64 ASTRELEBIA LAPPACEA CURLY MITCHELL GRASS YANDA	APPLICATION (AU): 21/5/96 AU 96/101 ACCEPTED 22/5/96	NEW SOUTH WALES	AUSTRALIA ENDEMIC TO AUSTRALIA, FOUND IN QLD, NSW, SA, WA, & NT. THERE ARE MANY ECOTYPES. A SIMPLE SELECTION FROM 289 ACCESSIONS COLLECTED FROM THE WILD. NOT COMPARED WITH SOURCE GERMPASM. NPB.
HSCA/RAFI-65 ASTRELEBIA PECTINATA MITCHELL GRASS TURANTI	APPLICATION (AU): 21/5/96 AU 96/100 ACCEPTED 22/5/96	NEW SOUTH WALES	AUSTRALIA SELECTION FROM WILD ACCESSIONS SELF SEED UNDER SINGLE PLANT SELECTIONS. NOTAGS. ENDEMIC TO AUSTRALIA, FOUND IN QLD, NSW, SA, WA, & NT. THERE ARE MANY ECOTYPES. NPB.
HSCA/RAFI-66 BANKSIA COCCINEA BANKSIA WAITE CRIMSON	APPLICATION (AU): 2/11/92 AU 92/172 ACCEPTED 18/11/92 AKA ALBANY BANKSIA	LUMINIS PTY LTD, (UNIV. ADELAIDE)	AUSTRALIA NATIVE IN SOUTHWESTERN AUSTRALIA. OUTSTANDING ORNAMENTAL COMMONLY AVAILABLE AS A CUT FLOWER. OPEN POLLINATION OF B. COCCINEA BY DR M SEDGELY AT WAITE INSTITUTE, UNIVERSITY OF ADELAIDE. SELECTED FOR YIELD, COLOUR, BLOOM, TIME OF FLOWERING. IN THE TRIAL WAITE CRIMSON WAS COMPARED WITH WAITE FLAME, (SEE BELOW). NPB. PROBUSE.
HSCA/RAFI-67 BANKSIA COCCINEA BANKSIA WAITE FLAME	APPLICATION (AU): 21/10/94 AU 94/211, ACCEPTED 25/10/94	LUMINIS PTY LTD, (UNIV. ADELAIDE) AUSTRALIA	AUSTRALIA. SEE WAITE CRIMSON ABOVE..

HSCA/RAFI-68 BOTHRIOCHLOA BLAHDII FOREST BLUE GRASS SWANN	APPLICATION (AU): 24/3/95 AU 95/114 GRANTED 30/9/97	QUEENSLAND	AUSTRALIA SELECTION FROM A RANGE OF BOTHRIOCHLOA VARIETIES. A NATIVE FOUND IN OPEN FOREST COUNTRY IN ALL THE MAINLAND STATES & TERRITORIES OVER AN ENORMOUS RANGE OF CONDITIONS. QDPI NEEDS TO BE FAR MORE SPECIFIC ABOUT THE ORIGIN OF THE GERMPASM USED HERE. NOTAGS. NPB. CPI 11408
HSCA/RAFI-69 BUCHLOE DACTYLOIDES BUFFALO GRASS OASIS	APPLICATION (AU): 4/9/92 AU 92/136 ACCEPTED 22/9/92	UNIVERSITY OF NEBRASKA	UNCERTAIN. HAS NEVER BEEN DESCRIBED IN A PVR JOURNAL. SURELY IT DOES NOT TAKE 6 YEARS TO FINALISE A DESCRIPTION & TRIAL. AKA 609
HSCA-RAFI-70 HOMALOMENA ? GOOD AS GOLD	APPLICATION (AU): 2/8/95 AU 95/199, GRANTED 19/6/98	REDLANDS NURSERY P/L	UNCERTAIN, PROBABLY CHINA . PBR WAS GRANTED DESPITE NO IDENTIFICATION OF THE SPECIES. PBRO DOCUMENTS READ "HOMALOMEA NOT YET IDENTIFIED". A GENUS WITH ABOUT 140 SPECIES WORLDWIDE, NEW COMMERCIAL INTEREST IS IN CHINESE HOMALOMENA SPECIES BOTH AS HOUSEPLANTS AND FOR TRADITIONAL MEDICINAL USES.
HSCA/RAFI-71 CHAMELAUCIUM UNCINATUM GERALDTON WAX FLOWER ELEGANCE	APPLICATION (AU): 3/10/90 AU 90/100 GRANTED 22/8/94	AUSTRALIAN WAX FARMS	AUSTRALIA ORIGINATED FROM OPEN POLLINATED PLANTS IN THE WA BUSH & WAS SELECTED ON THE BASIS OF GROWTH, FLOWERING, AND FLOWER CHARACTERISTICS. PROPAGATED BY CUTTINGS FOR 2 GENERATIONS. THIS IS PBR ON A DISCOVERY. IT IS NOT AN "INVENTION" AS NEEDED UNDER THE ACT. NPB.
HSCA/RAFI-72 CHLORIS GAYANA RHODES GRASS NEMKAT	APPLICATION (AU): 24/3/95 AU 95/115 ACCEPTED 24/4/95	QUEENSLAND	UNCERTAIN, PROBABLY ZIMBABWE . KATAMBORA TYPE RHODES GRASS DERIVED FROM CPI 125663 EX ZIMBABWE SELECTED FOR NEMATODE RESISTANCE. NOTAGS.
HSCA/RAFI-73 DANTHONIA LINKII WALLABY GRASS BUNDERRA	APPLICATION (AU): 27/9/91 AU 91/099 GRANTED 17/11/92	NEW SOUTH WALES	AUSTRALIA GROWS NATURALLY IN VIC, QLD, & NSW. THERE ARE A WIDE RANGE OF ECOTYPES MATCHING VARIED CLIMATES. HAS NSW AGRICULTURE BRED THIS VARIETY OR SIMPLY SELECTED IT? ALSO HAVE THEY USED THE APPROPRIATE COMPARATORS FROM THE AREA BUNDERRA ORIGINALLY COMES FROM?
HSCA/RAFI-74 DANTHONIA RICHARDSONII WALLABY GRASS HUME	APPLICATION (AU): 16/1/95 AU 95/007 GRANTED 8/3/96	CSIRO CANBERRA	AUSTRALIA A NATIVE GRASS SPECIES VERY WIDESPREAD ACROSS EASTERN AUSTRALIA WITH MANY DIFFERENT ECOTYPES. IT IS VERY PALATABLE AS A STOCK FEED & QUITE NUTRITIOUS. WELL TESTED AS A PASTURE PLANT IN VIC. UNCLEAR IF APPROPRIATE COMPARATORS WERE USED.
HSCA/RAFI-75 DANTHONIA RICHARDSONII WALLABY GRASS TARANNA	APPLICATION (AU): 27/9/91 AU 91/098 GRANTED 17/11/92	NEW SOUTH WALES	AUSTRALIA (SEE HUME ABOVE) NOTAGS. INSTEAD ECOTYPES FROM COWRA IN THE CENTRAL PLAINS OF NSW, THE ARBORETUM AT ARMADALE, NEW ENGLAND, NSW & NEAR KINGSTON, NSW (ALSO A NEW ENGLAND STRAIN) WERE USED.

HSCA/RAFI-76 GLYCINE LATIFOLIA GLYCINE CAPELLA	APPLICATION (AU): 15/12/93 AU 93/272 GRANTED 23/1/95	CSIRO QUEENSLAND	AUSTRALIA NATIVE PASTURE SPECIES. COLLECTED EAST OF CAPELLA IN CENTRAL QLD IN 1982 WITH 17 OTHER ACCESSIONS OF THIS SPECIES. NOTAGS. NPB. THIS PBR WAS SURRENDERED BY CSIRO IN 1997. NO REASON WAS GIVEN. CQ 3368
HSCA/RAFI-77 HARDENBERGIA VIOLACEA HARDENBERGIA PINK FIZZ	APPLICATION (AU): 07/07/92 AU 92/104 GRANTED 23/7/93	P&D SHIELLS	AUSTRALIA A NATIVE SPECIES WIDESPREAD IN CENTRAL VIC & NUMEROUS PROVENANCES HAVE BEEN ASSESSED AT WAKTI NURSERY SHEPPARTON, VIC. PINK FIZZ IS A SELECTION MADE FROM PLANTS COLLECTED FROM THE PYALONG REGION IN 1986. NPB. IT WOULD BE NICE TO THINK THIS IS WHY P & D SHIELLS SURRENDERED IT IN 1995. HOWEVER IT WAS SURRENDERED BECAUSE IT COULD NOT BE PROPAGATED IN QUANTITY WITHOUT DISEASE.
HSCA/RAFI-78 KUNZEA POMIFERA MUNTRIES RIVOLI BAY	APPLICATION (AU): 22/02/96 AU 96/031 ACCEPTED 27/5/96 AKA: MUNTARI	AUSTRALIAN NATIVE PRODUCE IND.	AUSTRALIA AN IMPORTANT STABILIZER OF SANDY SOILS IN VIC & SA. FRUITS USED BY ABORIGINES AND SETTLERS. INTRODUCED TO CULTIVATION IN 1889 IN ENGLAND.. DRIED MUNTRIES WERE TRADED BY SA ABORIGINES LIVING IN THE COORONG REGION. AVAILABLE FROM NURSERIES AS A DECORATIVE GROUND COVER. PROBUSE.
HSCA/RAFI-79/80 LOTUS CORNICULATUS LOTUS GRASSLANDS GOLDIE	NZ #566 GRANTED 20/5/91 APPLICATION (AU): 22/06/92 AU 92/092 GRANTED 29/7/94	NZ AGRESEARCH GRASSLANDS RES. CENTRE	EUROPE. A NATIVE OF SOUTHERN EUROPE. SELECTED FROM OVERSEAS MATERIAL 1973-76. THE DESCRIPTION STATES THAT PLANTS SHOWING BEST PRODUCTIVITY & PERSISTENCE WERE POLYCROSSED & USED TO ESTABLISH A PRE-NUCLEOUS STOCK IN 1982. SOURCE OR NAME OF ORIGINAL MATERIAL IS NOT GIVEN. NOTAGS. NPB.
HSCA/RAFI-81 LOTUS PENDUNCULATUS LOTUS SHARNAE	APPLICATION (AU): 18/6/93 AU 93/147 GRANTED 13/2/95	NEW SOUTH WALES	PORTUGAL SHARNAE AROSE FROM THE LONG TERM SELECTION OF EARLY FLOWERING PLANTS FROM SEED COLLECTED IN PORTUGAL. THE CPI & THE NAME OF THE ORIGINAL VARIETY FROM WHICH THE SEED WAS TAKEN IN PORTUGAL IS NOT GIVEN IN THE DESCRIPTION. THE ORIGINAL GERMLASM WAS NOT USED AS A COMPARATOR. INSTEAD A NEW ZEALAND STRAIN GRASSLANDS MAKU, WAS USED. CPI 67677
HSCA/RAFI-82/83/84/85 MACROPTILIUM ATROPURPUREUM SIRATRO AZTEC	APPLICATION (AU): 21/12/93 AU 93/276 GRANTED 23/1/95	CSIRO QUEENSLAND	COLOMBIA/EL SALVADOR/MEXICO PVR JOURNAL SAYS AZTEC IS A MIXTURE OF 4 POPULATIONS EACH DERIVED BY BACKCROSSING A RUST RESISTANT ACCESSION OF M ATROPURPUREUM TO SIRATRO FOR 4 GENERATIONS & SELFING FOR 2 GENERATIONS TO IDENTIFY RUST RESISTANT LINES. THE 4 STRAINS COME FROM EL SALVADOR (CQ 90847), SONORA, MEXICO (CPI 92640) OAXACA, MEXICO (CPI 90847) & COLOMBIA (CPI 92640). COMMERCIAL PRODUCTION BY MULTIPLICATION OF ALL 4 POPULATIONS. IS THIS 1 VARIETY OR 4 VARIETIES? CSIRO HAS TRIED TO BREED 4 VARIETIES. WHY IS PBR FOR 1? A WIDESPREAD SPECIES IN CENTRAL AMERICA WITH A HIGH DIVERSITY. NOTAGS, ONLY A SINGLE UNNAMED COMPARATOR. MORPHOLOGY IS VERY SIMILAR TO SIRATRO. ONLY MINOR DIFFERENCES APPARENT.

HSCA/RAFI-86 MENTHA DIEMENICA SLENDER MINT KOSCIUSKO	APPLICATION (AU): 22/02/96 AU 96/030 ACCEPTED 27/5/96	AUSTRALIAN NATIVE PLANT IND.	AUSTRALIA NOT DESCRIBED IN PVR JOURNAL. A NATIVE WILD HERB FOUND IN TAS, NSW, QLD, SA, AND VIC. PROBUSE.
HSCA/RAFI-87 MICROLAENA STIPOIDES WEeping GRASS GRIFFIN	APPLICATION (AU): 14/2/95 AU 95/052 GRANTED 13/12/95 AKA: MICROLAENA, MEADOW RICE GRASS, WEEPING RICE GRASS	UNIV. OF NEW ENGLAND NSW	AUSTRALIA SELECTION OVER 4 GENERATIONS OF AN ECOTYPE COLLECTED NEAR THE MUSEUM OF AUSTRALIA ACT. COMPARED WITH SHANNON (SEE LISTING) WAKEFIELD (SEE LISTING) & 2 OTHERS. FOUND IN ALL STATES OF AUSTRALIA WITH MANY DIFFERENT ECOTYPES. THE ORIGINS OF THE 2 ECOTYPES ARE NOT SPECIFIED & SHANNON COMES FROM THE NEW ENGLAND REGION OF NSW MANY HUNDREDS OF KILOMETERS AWAY FROM THE ACT. COMPARATORS ARE NOT SHOWN TO BE APPROPRIATE. NPB. PROBABLY NATURALLY OCCURRING AROUND CANBERRA. IT MAY EVEN BE A COMMONLY SOWN NATIVE GRASS SPECIES.
HSCA/RAFI-88 MICROLAENA STIPOIDES WEeping GRASS SHANNON	APPLICATION (AU): 19/5/94 AU 94/124 GRANTED 8/3/96 AKA: MICROLAENA, MEADOW RICE GRASS, WEEPING RICE GRASS	UNIV. OF NEW ENGLAND NSW	AUSTRALIA SELECTION OVER 4 GENERATIONS OF AN ECOTYPE COLLECTED EAST OF GLEN INNES IN NORTHERN NSW. COMPARED WITH GRIFFIN (SEE LISTING) WAKEFIELD (SEE LISTING) & 2 OTHER ECOTYPES. OIGIN OF THE 2 ECOTYPES IS NOT SPECIFIED; WAKEFIELD FROM EAST OF ARMIDALE (UP TO 150 KM AWAY) & GRIFFIN COMES FROM ACT. COMPARATORS ARE NOT CLEARLY APPROPRIATE & NPB.
HSCA/RAFI-89 MICROLAENA STIPOIDES WEeping GRASS WAKEFIELD	APPLICATION (AU): 19/5/94 AU 94/125 GRANTED 13/3/96 AKA: MICROLAENA, MEADOW RICE GRASS, WEEPING RICE GRASS	UNIV. OF NEW ENGLAND	AUSTRALIA SELECTION FROM HEAVILY STOCKED, HIGHLY IMPROVED PASTURE IN THE NEW ENGLAND REGION OF NSW. COMPARED WITH GRIFFIN (SEE LISTING) SHANNON (SEE LISTING) & 2 OTHER ECOTYPES. NPB. ORIGINS OF THE 2 UNNAMED ECOTYPES NOT SPECIFIED. SUPPOSEDLY ORIGINATES FROM EAST OF ARMIDALE ON A NSW FARM WITH IMPROVED PASTURE. THIS SUGGESTS THAT GENERATIONS OF FARMERS OVER THE PAST HUNDRED OR SO YEARS NEVER NOTICED THAT IT WAS DOING WELL & DID NOT ENCOURAGE IT OR SHARE SEED WITH NEIGHBOURS. PROBABLY WIDESPREAD AT THE ORIGIN.
HSCA/RAFI-90/91 NEOTYPHODIUM ENDOPHYTE FESCUE AR501	NZ #1079 GRANTED 23/4/96 APPLICATION (AU): 21/5/97 AU 97/111, ACCEPTED 26/05/97	NZ PASTORAL RES. INST., PALMERSTON, NZ	ALGERIA A FUNGUS OBTAINED BY ISOLATION & CULTURING OF TALL FESCUE SEED COLLECTED IN ALGERIA. SELECTED FOR LACK OF SECONDARY TOXIC METABOLITES, LOLITREM B & ERGOVALINE & FOR PRODUCTION OF BENEFICIAL ALKALOID PERAMINE & NONTOXIC LOLINES. NOTAGS. AREADY KNOWN IN ALGERIA?
HSCA/RAFI-92/93 NEOTYPHODIUM ENDOPHYTE RYEGRASS AR1	NZ #1078 GRANTED 23/4/96 APPLICATION (AU): 11/1/97 AU 97/013, ACCEPTED 06/02/97	NZ PASTORAL RES. INST., PALMERSTON, NZ	ITALY A FUNGUS OBTAINED BY ISOLATION & CULTURING OF PERRENIAL RYEGRASS COLLECTED IN ITALY. SELECTED FOR LACK OF SECONDARY TOXIC METABOLITES, LOLITREM B & ERGOVALINE & PRODUCTION OF BENEFICIAL ALKALOID PERAMINE & NON-TOXIC LOLINES. NOTAGS. ALREADY KNOWN IN ITALY?

HSCA/RAFI-94 ORNITHOPUS SATIVUS PINK SERRADELLA GRASSLANDS KOHA	APPLICATION (AU): 31/10/88 AU 88/035 GRANTED 14/11/89 AKA: FRENCH SERRADELLA	NZ DSIR	EUROPE A SELECTION WITHIN AN UNNAMED COMMERCIAL SEEDLINE IMPORTED FROM EUROPE TO NZ IN 1958.. TRIALLED AGAINST MAIA, BIATA, AZA, GERMAN COMMERCIAL & LA CORRUNA. PREDATES PVR. ORIGINAL EUROPEAN VARIETY IS NOT IDENTIFIED. NPB. CERTIFICATE ABANDONED
HSCA/RAFI-95 OZANTHAMNUS DIOSMIFOLIUS RICEFLOWER COOK'S SNOW WHITE	APPLICATION (AU): 16/12/92 AU 92/184 GRANTED 12/9/94	EG & ER COOK	AUSTRALIA IN 1988 MORE THAN 40 TYPES OF RICEFLOWER WERE PLANTED ON E G & E R COOK'S PROPERTY AT LILLYDALE IN QLD. CUTTINGS HAD BEEN TAKEN FROM SELECTED BUSH SEEDLINGS IN SE QLD & NORTHERN NSW. SELECTED IN 1991 FOR VEGETATIVE PROPAGATION & TRIAL, INCLUDING COOK'S SNOW WHITE, COOK'S TALL PINK & COOK'S SALMON TOGETHER WITH REDLANDS 44-7. NPB. NOTAGS.
HSCA/RAFI-96 OZANTHAMNUS DIOSMIFOLIUS RICEFLOWER COOK'S TALL WHITE	APPLICATION (AU): 14/12/92 AU 92/185 GRANTED 12/9/94	EG & ER COOK	AUSTRALIA SEE COOK'S SNOW WHITE ABOVE. NOTAGS.
HSCA/RAFI-97 OZANTHAMNUS DIOSMIFOLIUS RICEFLOWER REDLANDS SANDRA	APPLICATION (AU): 25/8/94 AU 94/184 GRANTED 24/4/97	QUEENSLAND RURAL INDUSTRIES R&D CORP., CANBERRA	AUSTRALIA RECURRENT SELECTION OF MATERIAL FROM QLD WILD POPULATIONS AT REDLANDS STATION. SIMPLY 'DISCOVERY' AND PROPAGATION. NPB. NOTAGS. IT ONLY INCLUDED COOK'S TALL PINK & COOK'S WHITE SNOW AKA: BALL EVERLASTING, SELECTION 44.7
HSCA/RAFI-98/99 PANDOREA JASMINOIDES PANDOREA SOUTHERN BELLE	APPLICATION (AU): 21/03/95 AU 95/110 GRANTED 28/2/97 APPLICATION (NZ): 1/2/96 NZ SHM083	ROD PARSONS	AUSTRALIA CHANCE SEEDLING SELECTED FOR FLOWER COLOUR, SIZE & NUMBER. NO STATEMENT OF ORIGIN. NPB. A NATIVE WOODY FLOWERING VINE FOUND IN TEMPERATE RAINFORESTS FROM NORTHERN NSW TO EAST GIPPSLAND IN VIC. SIGNIFICANT DIVERSITY IN THE SPECIES. CULTIVATED FOR YEARS. 4 NAMED TYPES AND MANY UNNAMED ONES.
HSCA/RAFI-100 PANICUM LAXUM PANIC GRASS SHADEGRO	APPLICATION (AU): 18/06/94 AU 95/132 GRANTED 19/5/95	CSIRO QUEENSLAND	UNCERTAIN WAITING ON VOL. 7 NO 3 OF PVR JOURNAL GIVING DESCRIPTION TO ASSESS THIS BREEDING & PBR STATUS. CPI 53932
HSCA/RAFI-101 PANICUM MAXIMUM GUINEA GRASS NATSUYUTAKA	APPLICATION (AU): 26/02/91 AU 91/018 GRANTED 31/5/94	KYUSHU NATIONAL AGRIC. EXP. STATION, JAPAN	AFRICA. ORIGINATED FROM AN AFRICAN ECOTYPE OF PANICUM MAXIMUM. PRODUCED THROUGH A PROGRAM OF SINGLE PLANT SELECTION & LINE BREEDING INVOLVING 57 ACCESSIONS OBTAINED FROM AFRICA, USA & COLOMBIA. NOTAGS.
HSCA/RAFI-102 RHODANTHE ANTHEMOIDES PAPER DAISY PAPER CASCADE	APPLICATION (AU): 28/3/91 AU 91/024 GRANTED 22/7/92	PLANT GROWERS AUSTRALIA	AUSTRALIA NATIVE SPECIES IN QLD, NSW, VIC, & TAS. FOUND IN 1987 ON THE NEW ENGLAND PLATEAU BY E. SAIKIN OF MT WAVERLY VICTORIA. SUBSEQUENTLY PROPAGATED BY CUTTINGS. DOES 'DISCOVERY ' OF A WILD PLANT THAT ONE LIKES CONSTITUTE BREEDING. IS THIS AN INVENTION? NPB.
HSCA/RAFI-103 RHODANTHE ANTHEMOIDES PAPER DAISY PAPER STAR	APPLICATION (AU): 15/10/92 AU 92/164 GRANTED 14/9/94 AKA: CAMOMILE SUNRAY	PLANT GROWERS AUSTRALIA	AUSTRALIA. AROSE FROM TRIALS CONDUCTED AT PGA BETWEEN 1990 & 1993. SELECTED ON THE BASIS OF HABIT, FLOWERING QUALITIES & SEASON. WHERE DID THE ORIGINAL PLANT OR SEED MATERIAL COME FROM? NOTAGS. NPB.

HSCA/RAFI-104 SANTALUM ACUMINATUM QUANDONG POWELL'S NUMBER ONE	APPLICATION (AU): 25/9/92 AU 92/157 ACCEPTED 12/11/92	R&S TULLOCH P&A TAVERNA	AUSTRALIA QUANDONG ARE NATIVE TO SA, WA, VIC & NSW. THERE ARE MANY DIFFERENT ECOTYPES. THE DETAILED ORIGINS OF THE VARIETY ARE NOT KNOWN. AFTER 6 YEARS NO DESCRIPTION HAS BEEN PUBLISHED. PROBUSE.
HSCA/RAFI-105 SANTALUM ACUMINATUM QUANDONG FRAHN'S PARINGA GEM	APPLICATION (AU): 22/2/96 AU 96/028 ACCEPTED 27/5/96	A BEALE A SHARLEY	AUSTRALIA QUANDONG IS NATIVE TO SA, WA, VIC, & NSW. THERE ARE MANY DIFFERENT ECOTYPES. THE DETAILED ORIGINS OF THE VARIETY ARE NOT KNOWN. AFTER 2 YEARS NO DESCRIPTION HAS BEEN PUBLISHED. PROBUSE.
HSCA/RAFI-106 SYZGIUM AUSTRALE CREEK CHERRY BUSH CHRISTMAS	APPLICATION (AU): 13/4/95 AU 95/132 ACCEPTED 1/5/95 AKA: CREEK LILLY PILLY	FAIRHILL NATIVE PLANTS	AUSTRALIA SEEDLING SELECTION FROM COMMON LILLY PILLY 1992 , AT YANDINA QLD. NOTAGS. NPB.
HSCA/RAFI-107 TELOPEA SPECIOSISSIMA WARATAH CARDINAL	APPLICATION (AU): 14/6/94 AU 94/133 GRANTED 10/9/97 AKA: POPE'S WEROMBA CARDINAL	P. NIXON YELLOW ROCK NATIVE NURSERY	AUSTRALIA A NATIVE OF NORTHERN NSW. NIXON MOVED THE ORIGINAL CARDINAL TREE FROM THE PROPERTY OF LUCILLE POPE WHERE IT HAD BEEN GROWING SINCE 1954. HE MOVED THE 40 -50 YEAR OLD TREE TO A NEW SITE ON HIS PROPERTY & THEN OBTAINED PBR. NOTAGS. PREPBR (BY 33 YEARS!).
HSCA/RAFI-108 TELOPEA SPECIOSISSIMA WARATAH DREAMING	APPLICATION (AU): 23/3/95 AU 95/111 ACCEPTED 27/3/95	B. FITZPATRICK	AUSTRALIA. 3 YEARS HAVE PASSED SINCE THIS APPLICATION WAS LODGED WITH NO DESCRIPTION BEING PUBLISHED TO ALLOW COMMENT OR OBJECTION. PROBUSE.
HSCA/RAFI-109 TELOPEA SPECIOSISSIMA WARATAH FIRE & BRIMSTONE	APPLICATION (AU): 26/4/94 AU 94/097 GRANTED 30/9/97	P. NIXON YELLOW ROCK NATIVE NURSERY	AUSTRALIA UNKNOWN PARENT FROM KANGALOOON NSW. IS THIS A WAY OF AVOIDING SAYING IT IS A WILD BUSH TYPE? NOTAGS. NPB.
HSCA/RAFI-110 TELOPEA SPECIOSISSIMA WARATAH FIRE & ICE	APPLICATION (AU): 05/9/95 AU 95/234 ACCEPTED 11/10/95	R. ROTHER	AUSTRALIA. UNKNOWN PARENT. IS THIS A WAY OF AVOIDING SAYING IT IS A WILD BUSH TYPE? NOTAGS. NPB.
HSCA/RAFI-111 TELOPEA SPECIOSISSIMA WARATAH SHADES OF PALE	APPLICATION (AU): 28/8/95 AU 95/208 GRANTED 30/9/97	P. NIXON	AUSTRALIA UNKNOWN PARENT. IS THIS A WAY OF AVOIDING SAYING IT IS A WILD BUSH TYPE? NOTAGS. NPB
HSCA/RAFI-112 TELOPEA SPECIOSISSIMA WARATAH SUNBURST	APPLICATION (AU): 28/5/90 AU 90/062 GRANTED 17/2/92	UNIV. OF SYDNEY, NSW	AUSTRALIA NSW NATIVE SPECIES, A POPULAR COMMERCIAL ORNAMENTAL FLOWER AROUND THE WORLD. PVR JOURNAL SAYS VARIETY AROSE FROM A SINGLE OPEN POLLINATED SEEDLING SELECTED IN 1987 BY UNIV. OF SYDNEY. SOURCE SEED IS NOT STATED. IMPOSSIBLE TO KNOW IF THE COMPARATORS ARE THE CLOSEST AVAILABLE VARIETIES. NPB.
HSCA/RAFI-113 TELOPEA SPECIOSISSIMA WARATAH SUNFLARE	APPLICATION (AU): 28/5/90 AU 90/063 GRANTED 17/2/92	UNIV. OF SYDNEY, NSW	AUSTRALIA (SEE SUNBURST ABOVE) NAME OF THE SOURCE SEED IS NOT STATED. IMPOSSIBLE TO KNOW IF THE COMPARATORS ARE THE CLOSEST AVAILABLE VARIETIES. NPB.
HSCA/RAFI-114 TELOPEA SPECIOSISSIMA WARATAH SONGLINES	APPLICATION (AU): 11/7/96 AU 96/135, ACCEPTED 22/7/96	YELLOW ROCK NATIVE NURSERY P/L	AUSTRALIA. NAME IS A REFERENCE TO SPIRITUAL BELIEFS OF CENTRAL AUSTRALIAN INDIGENOUS PEOPLE. PROBUSE.

HSCA/RAFI-115 THEMEDA TRIANDRA KANGAROO GRASS TANTANGARA	APPLICATION (AU): 20/5/96 AU 96/099 ACCEPTED 5/6/96	CSIRO CANBERRA	AUSTRALIA SELECTION FROM NATURALLY OCCURRING POPULATION ON MONARO TABLELAND IN NSW. SELECTED FOR LOW BIOMASS & ARCHITECTURE. COMPARITIVE TRIALS USED ECOTYPES FROM SHEPHERD'S LOOKOUT IN CANBERRA; FROM BAWLEY POINT ON THE NSW COAST & DOUGLAS PARK IN NSW. THESE WITH TANTANGARA FORM A TRANSECT THAT COVERS SOME OF VARIATION KNOWN IN THE SPECIES WHICH OCCURS NATURALLY OVER AUSTRALIAN & AFRICAN CONTINENTS. NOTAGS.
HSCA/RAFI-116 TRIFOLIUM REPEN WHITE CLOVER CLEVER CLUB	APPLICATION (AU): 5/10/94 AU 94/205 GRANTED 17/10/96	SUSAN M. LOVE, VIC	AUSTRALIA SELECTION FROM A LOCAL ECOTYPE NEAR MELBOURNE, VICTORIA. COMPARED WITH HAIFA & PRESTIGE VARIETIES IN TRIAL. NOTAGS. NPB.
HSCA/RAFI-117 TRIFOLIUM RESUPINATUM PERSIAN CLOVER LASER	APPLICATION (AU): 16/1/95 AU 95/018 ACCEPTED 24/1/95	SA SEED GROWERS COOP.	UNCERTAIN NO DATA AVAILABLE. PROBUSE.
HSCA/RAFI-118 TRIFOLIUM RESUPINATUM PERSIAN CLOVER LEETON	APPLICATION (AU): 16/1/95 AU 95/019 ACCEPTED 24/1/95	SA SEED GROWERS COOP.	UNCERTAIN NO DATA AVAILABLE PROBUSE.
HSCA/RAFI-119 TRIFOLIUM VESICULOSUM ARROWLEAF CLOVER ARROTAS	APPLICATION (AU): 3/12/96 AU 96/274 ACCEPTED 23/12/96	TASMANIA	UNCERTAIN UNKNOWN . PROBUSE.
HSCA/RAFI-120 TRITICUM DURUM DURUM WHEAT KRONOS	APPLICATION (AU): 19/12/94 AU 94/238 ACCEPTED 3/1/95	ARIZONA PLANT BREEDERS (US)	UNCERTAIN PROBUSE.
HSCA/RAFI-121 VIGNA UNGUICULATA COWPEA BIG BUFF	APPLICATION (AU): 29/10/92 AU 92/169 GRANTED 31/5/94	CSIRO QUEENSLAND	UNCERTAIN ACCORDING TO THE AJEA (VOL 35 PAGE 821)THIS VARIETY COMES VIA INTRALINE SELECTION OF CPI 96963. ORIGIN OF CPI 96963 IS NOT STATED BUT IS NOT AUSTRALIAN. NPB. NOTAGS.
HSCA/RAFI-122 LENS CULINARIS LENTIL MATILDA	NONE, EXCLUSIVE LICENSE	FAO TRUST (ICARDA)	ICARDA A SELECTION FROM ICARDA-IG-5823, A BREEDING LINE. SELECTED BY VIDA. WHAT IS THE BASIS FOR THE EXCLUSIVE LICENSE? EXCLUSIVE LICENSE TO THE LENTIL COMPANY
HSCA/RAFI-123 LENS CULINARIS LENTIL COBBER	NONE, EXCLUSIVE LICENSE	FAO TRUST (ICARDA)	ICARDA A SELECTION FROM ICARDA-IG-5728, A BREEDING LINE. COBBER'S PARENTS ARE ALSO FAO DESIGNATED. ONE IS OF UNKNOWN ORIGIN, ONE IS A LEBANESE FARMERS' VARIETY. SELECTED BY VIDA. WHAT IS THE BASIS FOR THE EXCLUSIVE LICENSE? EXCLUSIVE LICENSE TO THE LENTIL COMPANY
HSCA/RAFI-124 LENS CULINARIS LENTIL DIGGER	NONE, EXCLUSIVE LICENSE	FAO TRUST (ICARDA)	ICARDA A SELECTION FROM ICARDA-IG-5722, A BREEDING LINE. DIGGER'S PARENTS ARE IRANIAN & SYRIAN FARMERS' VARIETIES, BOTH FAO DESIGNATED. SELECTED BY VIDA. WHAT IS THE BASIS FOR THE EXCLUSIVE LICENSE?: EXCLUSIVE LICENSE TO THE LENTIL COMPANY

HSCA/RAFI-125 LENS CULINARIS LENTIL ALDINGA	NONE, LICENSE	FAO TRUST (ICARDA)	ICARDA ALDINGA IS A SELECTION FROM ICARDA-IG-5750, A BREEDING LINE. ALDINGA'S PARENTS ARE ETHIOPIAN & (MEXICAN OR ITALIAN) FARMERS' VARIETIES, BOTH FAO DESIGNATED. SELECTED BY VIDA. POSSIBLY AN EXCLUSIVE LICENSE LIKE COBBER, ETC. TO THE AUSTRALIAN FIELD CROPS ASSOCIATION.
HSCA/RAFI-126 BOTHRIOCHLOA PERTUSA INDIAN BLUE GRASS DAWSON	APPLICATION (AU): 5/2/90 AU 90/024, GRANTED 18/11/92	QUEENSLAND	UNCERTAIN ONE OF 10 LINES SELECTED FROM 128 LINES OF BOTHRIOCHLOA PERTUSA EVALUATED THROUGHOUT QLD. NO ORIGIN INFORMATION IN THE PVR JOURNAL. NO INFORMED COMMENT IS POSSIBLE WITHOUT THIS INFORMATION. GIVEN LACK OF INFORMATION, IT SHOULD NEVER HAVE BEEN APPROVED. NPB.
HSCA/RAFI-127 BOTHRIOCHLOA PERTUSA INDIAN BLUE GRASS MEDWAY	APPLICATION (AU): 11/11/91 AU 91/108, GRANTED 18/11/92	QUEENSLAND	UNCERTAIN SEE DAWSON. NPB.
HSCA/RAFI-128/129 BROMUS STAMINEUS GRAZING BROME GRASSLANDS GALA	NZ #509 GRANTED 25/7/90 APPLICATION (AU): 2/9/91 AU 91/090 GRANTED 21/12/92	NZ DSIR PYNE GOULD GUINNESS P/L NZ	CHILE SELECTED BY ALLAN STEWART OF PYNE GOULD GUINNESS FROM MATERIAL OBTAINED IN SANTIAGO, CHILE IN 1983 . THERE BEING NO SUITABLE COMMERCIAL VARIETIES OF BROMUS STAMINEOUS A COMPARISON WAS MADE WITH GRASSLANDS MTUA A VARIETY OF BROMUS WILDENOWII. NOTAGS OR CHILEAN COMPARITORS.
HSCA/RAFI-130 PHALARIS AQUATICA BULBOUS CANARY GRASS ATLAS PG	APPLICATION (AU): 19/12/97 AU 97/336 ACCEPTED 24/12/97	CSIRO PLANT INDUSTRIES WOOL RESEARCH AND DEVELOPMENT ORG. (AU)	MOROCCO CONTROLLED POLLINATION OF SIX CULTIVARS & ACCESSIONS OF MOROCCAN ORIGIN (PERLA KOLEGRASS, SIROCCO, EL GOLEA & CPI'S 14696, 19306, 19305) WITH SEED RETAINING BREEDING LINES (DISTANT PROGENITORS OF HOLDFAST) IN 1989, FOLLOWED BY BACK CROSSING TO PERLA KOLEAGRASS. AKA PERLA RETAINER
HSCA/RAFI-131 TRITICUM DURUM DURUM WHEAT WAITOHI	NZ #754, GRANTED 30/4/93	NZ INST. FOR CROP & FOOD RESEARCH LTD. FAO TRUST? (ICARDA)	CIMMYT/ICARDA. 'WAITOHI WAS BRED BY CIMMYT. IT WAS ACCESSIONED IN 1983 AS ENTRY #201 IN THE 14TH INTL. DURUM SCREEN NURSERY' ICARDA HOLDS DURUM COLLECTION.
HSCA-RAFI-132/133 TRITICUM AESTIVUM WHEAT MONAD	NZ #795, GRANTED 21/9/93 APPLICATION (AU): 24/7/96 AU 96/143, ACCEPTED 14/8/96	WRIGHTSON SEEDS P/L	MEXICO AND EUROPE. SOURCE GERMPLASM NOT IDENTIFIED. PVR JOURNAL SAYS BRED FROM "UNKNOWN NUMBERED LINES OF MEXICAN AND EUROPEAN ORIGIN FROM BREEDING PROGRAM IN 1980." TRIALED AGAINST 2 OTHER ALREADY PBR'D VARIETIES. NOTAGS.
HSCA/RAFI-134 ERAGROSTIS TEF TEFF DESSIE	APPLICATION (US): 21/11/88 US PVP 8900033, GRANTED 29/12/96	THE TEFF COMPANY (IDAHO, US. FORMERLY MASKAL FORAGES INC.)	ETHIOPIA. TWO GENERATION SELECTION OF AN ETHIOPIAN VARIETY SOLELY DESCRIBED AS BEING A "DARK SEEDED LINE" AND OBTAINED BY THE TEFF COMPANY FROM SOUTH DAKOTA STATE UNIVERSITY. ACCORDING TO THE TEFF COMPANY'S PBR APPLICATION, "THE ORIGINAL IDENTIFYING NUMBERS WERE LOST ON THE SOUTH DAKOTA MATERIAL." PI-601639. DESSIE IS A CITY IN ETHIOPIA. NPB. POSSIBLY NOTAGS.

<p>HSCA/RAFI-135 VIGNA UNGUICULATA COWPEA KUNDE ZULU</p>	<p>APPLICATION (US): 8/8/95 US PVP 9500268, GRANTED 28/6/96</p>	<p>NOR-CAL SEED COMPANY (CALIFORNIA, US) FAO TRUST? (IITA)</p>	<p>IITA. A BRED VARIETY; BUT 3 OF 4 GRANDPARENTS ARE FAO-DECLARED GERMPASM. THEY ARE A 1940S US CULTIVAR (CB5) AND INDIAN (IITA-TVU-2196), SOUTH AFRICAN (IITA-TVU-95 AKA RENOSTER), AND NIGERIAN (IITA-TVU-2 AKA WESTBRED) VARIETIES. THE CROSS WAS MADE BY THE PBR OWNER IN 1985 WHILE EMPLOYED BY IITA. THE OWNER SAYS "THE DISTINCTIVENESS OF KUNDE ZULU DERIVES FROM ITS HIGH PROPORTION OF EXOTIC PARENTAGE... IT IS ANTICIPATED THAT KUNDE ZULU WILL BE MARKETED AS A SPECIALITY LEGUME WITH THE UNIQUE APPEARANCE OF ITS GRAIN BEING A MAJOR SELLING POINT." THE OWNER CLEARLY MADE AN EFFORT TO DEVELOP KUNDE ZULU (PARTIALLY WHILE EMPLOYED BY IITA!); BUT ITS VALUE IS ALMOST COMPLETELY DERIVED FROM TRUST GERMPASM (ALTHOUGH THE CROSS PREDATES THE SIGNING OF TRUST AGREEMENTS). SHOULD THIS PBR MONOPOLY EXIST?</p>
<p>HSCA/RAFI-136 /137/138 ORYZA SATIVA BASMATI RICE MULTIPLE VARIETIES</p>	<p>US PAT. #5,663,484, GRANTED 2/09/97 US PVP 9600077, ACCEPTED 11/12/95 US PVP 8500011, GRANTED 31/10/85</p>	<p>RICETEC , INC. (US) FAO TRUST (IRRI) IRRI.</p>	<p>IRRI. Bas-867 & RT-1171 HAVE PAKISTANI OR INDIAN BASMATI FARMERS' VARIETIES AS ONE PARENT. CB-801, DESCRIBED AS IR-8 'DERIVATIVE'. PATENT COVERS ANY CROSS OF SOUTH ASIAN BASMATI WITH CB-801 TO ADAPT TO WESTERN HEMISPHERE. IT SPECIFICALLY IRRI. Bas-867 & RT-1171 HAVE PAKISTANI OR INDIAN BASMATI FARMERS' VARIETIES AS ONE PARENT. CB-801, DESCRIBED AS IR-8 'DERIVATIVE'. PATENT COVERS ANY CROSS OF SOUTH ASIAN BASMATI WITH CB-801 TO ADAPT TO WESTERN HEMISPHERE. IT SPECIFICALLY MATERIAL DUPLICATED IN USA.</p>
<p>HSCA/RAFI-139 ORYZA LONGISTAMINATA RED RICE XA-21</p>	<p>US PATENT PENDING FOR XA21 GENE</p>	<p>UNIVERSITY OF CALIFORNIA (US) FAO TRUST (IRRI)</p>	<p>IRRI. AN IRRI ACCESSION OF THIS AFRICAN "WILD" RICE SPECIES WAS THE SOURCE OF RESISTANCE TO RICE BACTERIAL BLIGHT. SCIENTISTS INTEND TO INTRODUCE THE GENE INTO COMMON COMMERCIAL RICE VARIETIES. PATENT OWNERS HAVE SET UP A "GENETIC RESOURCE RECOGNITION FUND," BUT THE ACCESSION WAS ALREADY THE SUBJECT OF IRRI RESEARCH AND HELD IN TRUST.</p>
<p>HSCA/RAFI-140/141 GOSSYPIMUM BARBADENSE SEA ISLAND COTTON PALO VERDE AND BUFFALO</p>	<p>US PVP 9400040 GRANTED 30/11/95 US PVP 9400039 GRANTED 30/11/95</p>	<p>SALLY V. FOX</p>	<p>UNCERTAIN, PROBABLY ECUADOR OR PERU. TWO VARIETIES OF COTTON WITH NATURAL COLORING BEING COMMERCIALIZED FOR NICHE MARKETS IN US AND OTHER NORTHERN COUNTRIES. GERMPASM DEVELOPED AND MAINTAINED BY INDIGENOUS PEOPLE AND FARMING COMMUNITIES BUT NOW OWNED BY A US ENTREPRENEUR. PALO VERDE IS PI-576175, BUFFALO IS PI-576174.</p>
<p>HSCA/RAFI-142/143 GOSSYPIMUM HIRSUTUM COTTON COYOTE AND GREEN</p>	<p>US PVP 8900169 GRANTED 28/9/90 US PVP 8900170 GRANTED 28/9/90</p>	<p>SALLY V. FOX</p>	<p>UNCERTAIN, PROBABLY MEXICO OR GUATEMALA. SEE PALO VERDE AND BUFFALO ABOVE. ALSO SEE RAFI COMMUNIQUE NOV. 1993. COYOTE IS PI-601707, GREEN IS PI-601708.</p>

HSCA/RAFI-144 X TRITICSECALE TRITCALE MIZAR	IT #412, 1987	ENEA	CIMMYT. ITALIAN PBR OFFICE CONFIRMS THAT THIS VARIETY, ESSENTIALLY DERIVED FROM A CIMMYT-INIA VARIETY, HAS BEEN "PROTECTED" IN ITALY. THE VARIETY IS ALSO GROWN IN OTHER EUROPEAN COUNTRIES
HSCA/RAFI-145 X TRITICSECALE TRITCALE MANIGERO	ES #759, 1989	SEMILLAS FITO	CIMMYT. SPAIN'S PBR OFFICE CONFIRMS THAT THIS VARIETY IS GROWN IN SPAIN UNDER PBR "PROTECTION". THE VARIETY IS ALSO GROWN UNDER ANOTHER NAME IN FRANCE.
HSCA/RAFI-146 TRITICUM DURUM DURUM WHEAT INBAR	IL	ISRAELI AGRICULTURAL RESEARCH ORGANIZATION, VOLCANI CENTRE	CIMMYT. THIS VARIETY IS SAID TO BE IDENTICAL TO OR ESSENTIALLY DERIVED FROM, A CIMMYT RELEASE. TERMINATED IN 1995.
HSCA/RAFI-147 CHENOPODIUM QUINOA QUINOA APELAWA	US PAT. #5,304,718	RESEARCH CORP. TECHNOLOGIES / COLORADO STATE UNIVERSITY / D. JOHNSON / S. WARD	BOLIVIA. A HIGH PROTEIN FOOD CROP THAT IS AN IMPORTANT PART OF THE DIET OF MILLIONS IN ANDEAN COUNTRIES, ESPECIALLY INDIGENOUS PEOPLE. IN 1994, AGRONOMISTS DUANE JOHNSON AND SARAH WARD OF COLORADO STATE UNIVERSITY RECEIVED US PATENT NO. 5,304,718, GIVING THEM EXCLUSIVE MONOPOLY CONTROL OF MALE STERILE PLANTS OF THE TRADITIONAL BOLIVIAN "APELAWA" QUINOA VARIETY AND ITS USE IN CREATING OTHER HYBRID QUINOA VARIETIES. PATENT ABANDONED

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