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The Impact of certification

In the case of cassava (*Manihot esculenta* Crantz), CIAT holds the most comprehensive collection in the world for one of the most important root staples and. The *in vitro* collection was established in the Genetic Resources Unit of CIAT in 1979 and the *in vitro* technique has been used not only to distribute selected germplasm from CIAT to national programs, but also to introduce into CIAT large numbers of new germplasm collected in the crop's major centers of variability. From 1979 to 2008 CIAT has shipped a total of 32,195 samples of cassava for 6,106 different accessions (almost the entire collection, more than five times its size). For each shipment, GRU keeps records of: i) identification and nature of recipient, ii) clones requested, iii) purpose of request, iv) acceptance of SMTA, and v) phytosanitary matters. Since 1999, a substantial increase in distribution can be noted, once the collection was being certified against diseases of quarantine importance (Figure 1), indicating that the effort paid off.

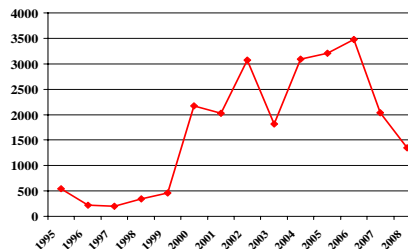


Figure 1. Annual rate of distribution of cassava germplasm by CIAT GRU over the last fourteen years.

The recipients of cassava germplasm, and their interest

The main recipients were CIAT Projects, who received 65.4 % of distributed accessions, while external institutions received 34.6 % (Figure 2). External users are mainly national programmes of agricultural research (NARS) (15.8%), universities (8.5%), commercial companies (6.6%), regional organizations (1.7%), and others (farmers, NGOs, genebanks and other CGIAR) (2.0%).

The main purposes of distribution were: i) plant breeding to introduce genes into new hybrids, ii) evaluation of clones in other countries (agronomy), iii) applied research (screening for resistances to pests and diseases), iv) basic research (cryopreservation, general biochemistry, nutrition, etc), v) training, and vi) others (Figure 3).

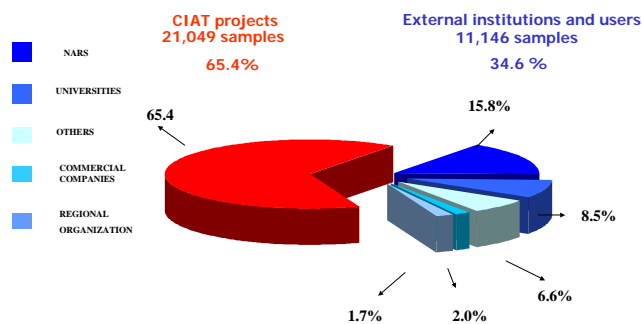


Figure 2. Distribution of cassava germplasm in the period 1979-2008.

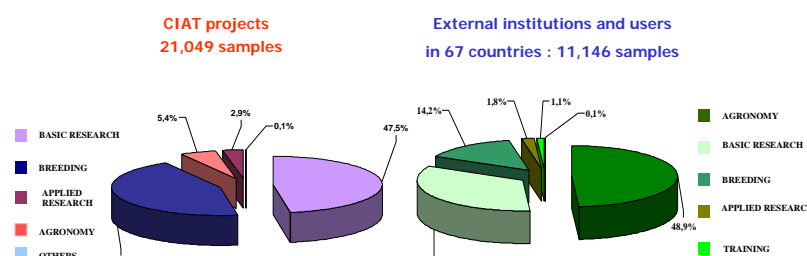


Figure 3. Main purposes in the distribution of cassava germplasm in 1979-2008.

The Impact of the distribution

Since 1978 when CIAT accepted a world mandate for that crop, 6,467 materials (from 28 countries) have been registered to date in the Multilateral System of Access and Distribution of Benefits of the International Treaty on Plant Genetic Resources for Food and Agriculture, within the framework of an agreement between the Governing Body of the Treaty and CIAT. The *in vitro* technique thus has been used, and CIAT has distributed (up to December 31, 2008) 32,195 samples (6,106 accessions) to programs in 67 countries (Figure 4). A total of 15 of 28 source countries have received a greater number of accessions as compared to numbers sent to CIAT indicating that the demand for cassava genetic resources is substantial (Table 1).

Out of the 28 source countries, the highest percentage corresponds to countries of Central and South America. The other countries on other continents, often with a low representation of accessions in the collection, have benefited by receiving many materials (e.g. China and Thailand who received the core collection – 630 clones). Colombia is the country that made the greatest contribution to the collection and received a large number of materials too. But the biggest benefit seems to have had access to a material such as Nataima 31 highly resistant to the whitefly. This material is the result of a cross between ECU 72 (from Ecuador) and BRA 12 (from Brazil) (Bellotti, A.C., 2001). These two clones are registered in the Multilateral System of the Treaty.

The collections held in trust ensure the preservation of national collections: four shipments of cassava towards Perú (in 1988), Paraguay (in 1989), Ecuador (in 1999) and Cuba (in 2005) were done as part of our efforts to restore germplasm to countries, namely after a natural disaster (Ecuador: El niño 1997, 1998; Cuba: hurricane Katrina 2005). The CIAT *Manihot* genebank generates multiple, global benefits to users, and on the other hand, the entry into force of SMTA since 2007 has no affected distribution rates.

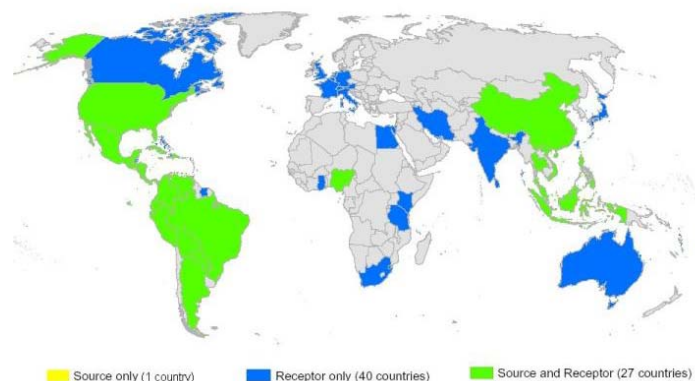


Figure 4. Movement of cassava germplasm from Countries to CIAT, and from CIAT to Countries.

Table 1. Holdings of cassava germplasm at CIAT-GRU, and accessions distributed to 28 source countries (up to December 31, 2008).

Country of origin	accessions (No.)		Country of origin	accessions (No.)	
	Received from	Distributed to		Received from	Distributed to
Colombia	2,000	381	Thailand	37	717
Brazil	1,281	827	Honduras	27	42
Peru	421	411	Jamaica	20	12
Venezuela	253	93	Nigeria	19	63
Paraguay	208	181	Pto. Rico	17	67
Costa Rica	81	73	United States	10	351
Indonesia	136	27	Vietnam	9	10
Argentina	122	71	Salvador	10	0
Ecuador	116	148	Bolivia	7	65
Mexico	106	129	Fiji	6	49
Guatemala	92	19	Philippines	6	76
Cuba	82	560	Dominican Rep	5	67
Malaysia	61	18	Nicaragua	3	55
Panama	47	87	China	2	362

Acknowledgements

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Literature Cited

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