

Status of Seed Sources and other propagation materials of Key Commercial Tree Species in Kenya

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PRESENTED AT THE COMMERCIAL CONFERENCE AND EXPO HELD ON
23RD NOVEMBER 2021



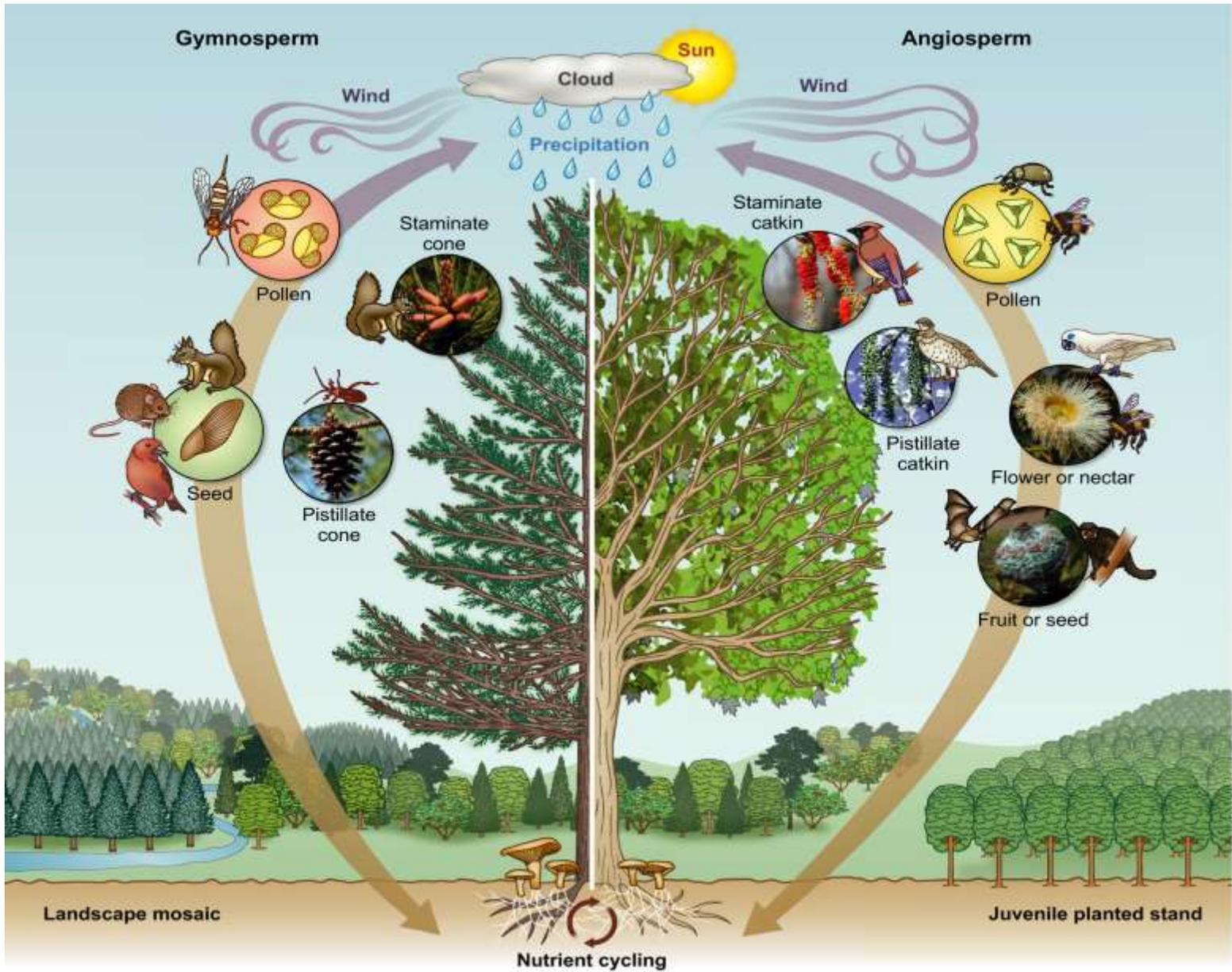
Introduction



A key input in commercial forestry is quality seeds or propagation material

Genetic quality of planting stock determines the performance of plantations (survival and productivity)

"How can the greatest genetic improvement be achieved?" and "How can improved germplasm be economically produced in sufficient quantities for large scale forestry programs?"



*Natural ecosystem
and regeneration*



Eucalyptus grandis elite trees



Clonal seedlings



Seeds



Seedlings from seeds



Uniform crop

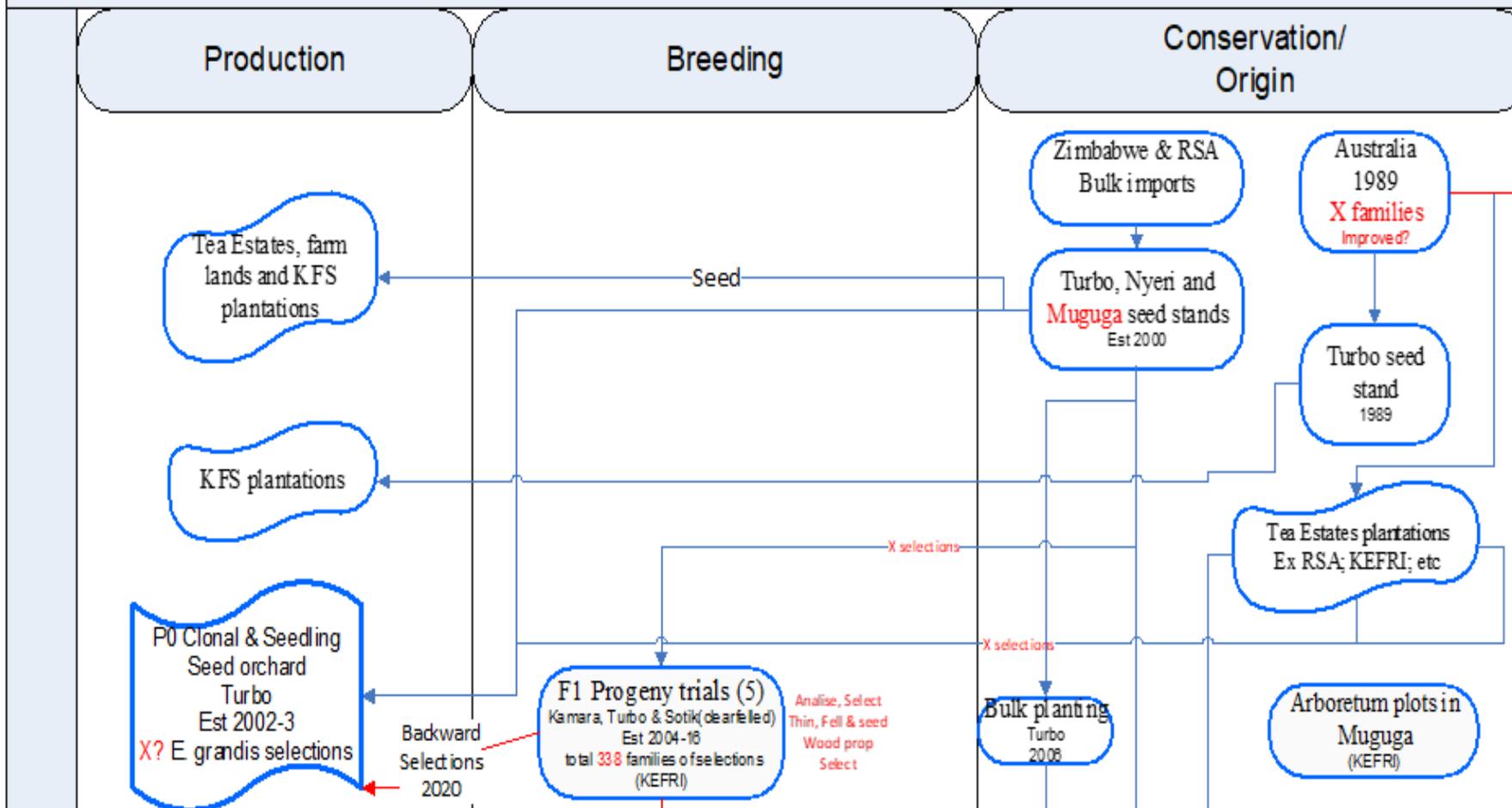
Objectives of the study

- Document all the seed and other propagation materials sources in the country including the seed source type
- Spatial database of KEFRI and other seed orchards/stands information
- Resource supply status quo and gap analysis
- List and document all the organizations or institutions that are involved in seed and other propagule collection and distribution.

Key species of focus (major commercial species)

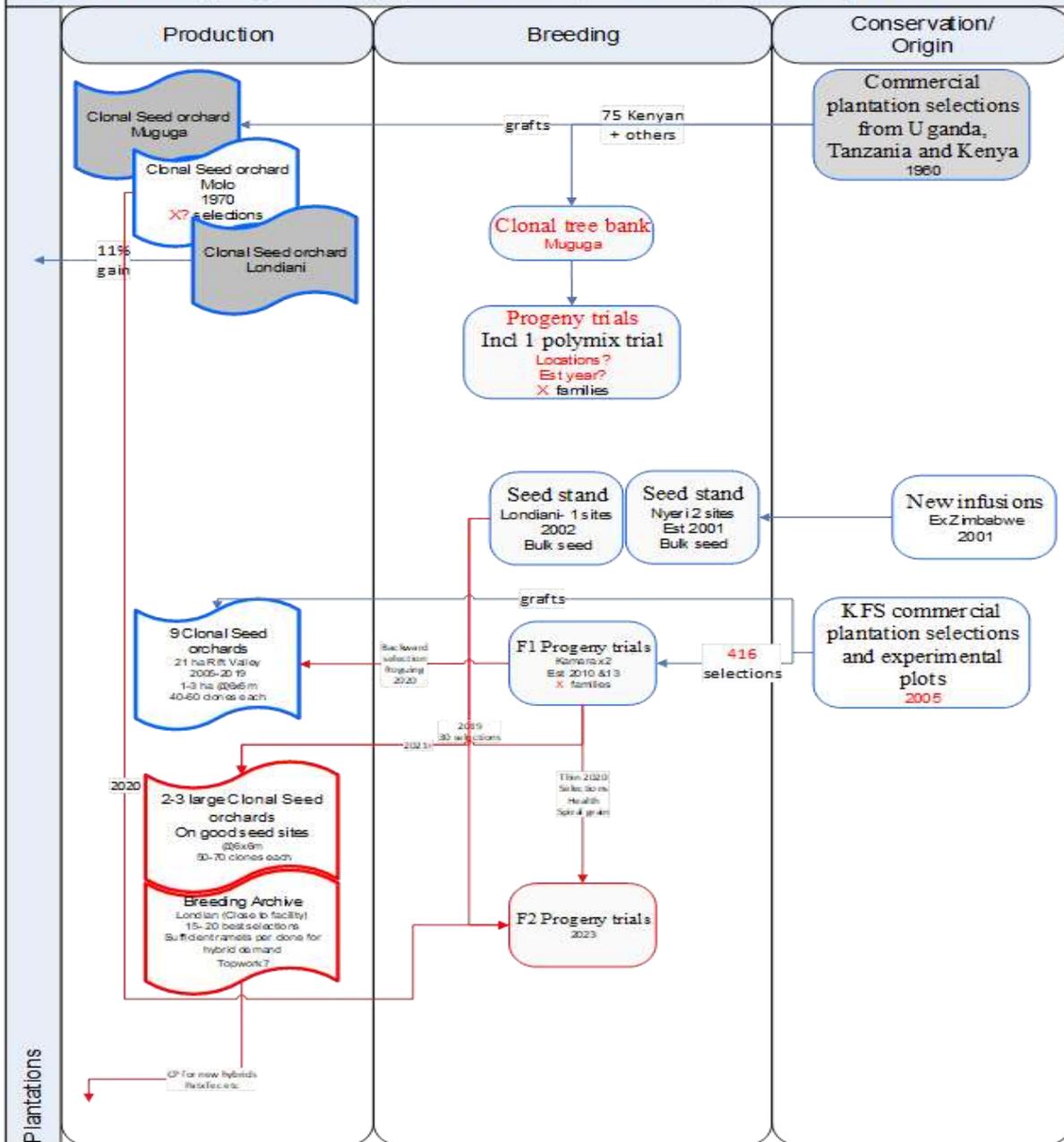
- *Cupressus lusitanica*,
- *Pinus patula*,
- *Eucalyptus grandis*,
- *Eucalyptus camaldulensis*,
- *Eucalyptus urophylla*,
- *Grevillea robusta*,
- *Melia volkensii*,
- *Casuarina equisetifolia* and
- *Casuarina junghuhniana*

E. grandis: Products: Transmission poles and sawn timber; improved productivity (splitting; growth; health & form)



111 families of various provenances imported from Australia through Camcore were established in 2019, as new infusions to broaden the genetic base.

P. patula: Timber (spiral grain issues), pulp & veneer. Growth, P&D tolerance, form, branching habit



Breeding program started in early 90s

Selections in East Africa

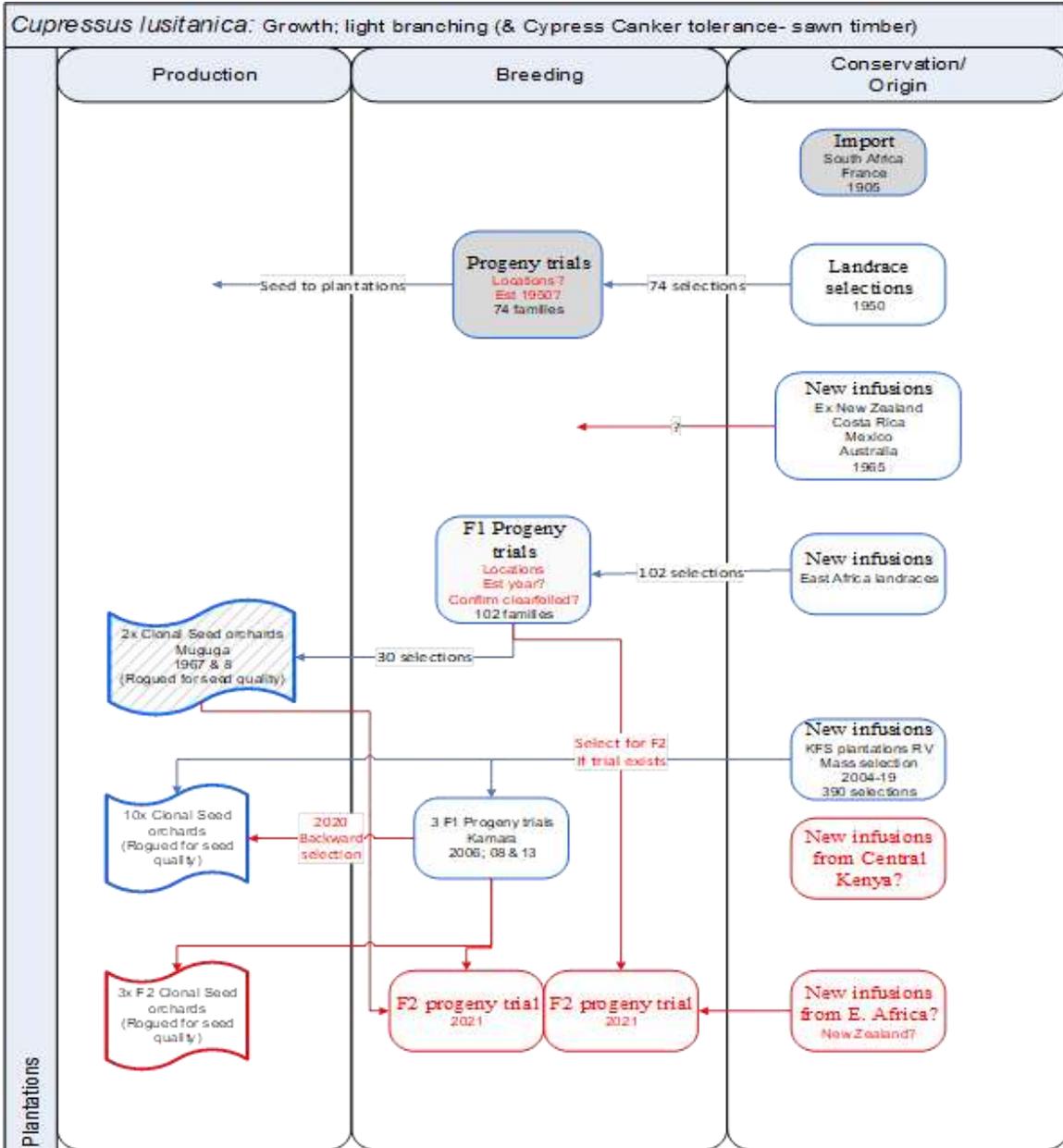
F1 progeny trials

Clonal seed orchard in Muguga, Londiani

New infusions to broaden genetic base (Zimbabwe-2001)

Genetic gains of 10%, 5%, and 11% increase in height, diameter at breast height and volume production per hectare





C. lusitanica introduced from South Africa and France in 1905.

Breeding began in 1950s

Several selections (78)

New infusions in 1965

Selection from EA land races (102)

F1 progeny trials

30 elite individuals selected

Clonal seed orchards

Genetic gain estimations is at 7%, 6% and 12% for height, diameter and volume/ha

Findings

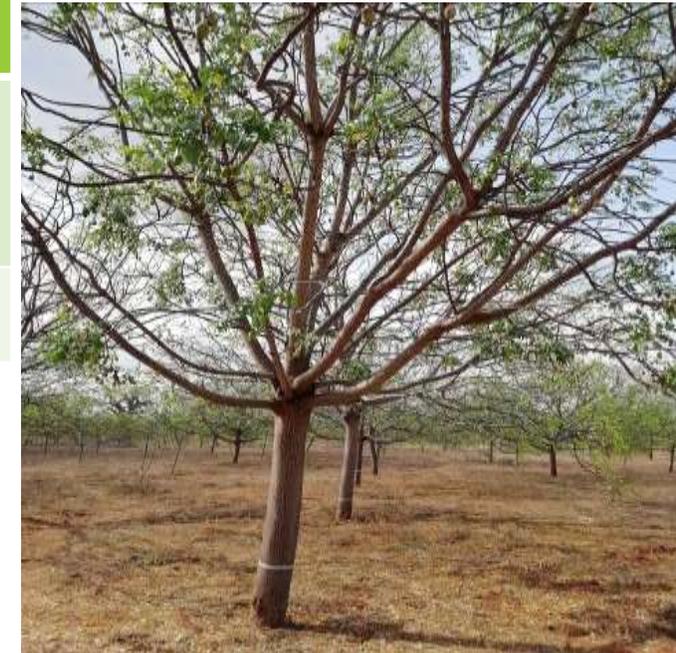
- KEFRI has established seed sources of various categories
 - Clonal Seed Orchards (CSO),
 - Seedling Seed orchards (SSO),
 - Established Seed Stands (ESS) and
 - Selected Seed Stands (SSS)
- Periodic evaluation of these seed sources is of great importance as it advises on the production potential, ensures the integrity of these seed sources and informs the breeding programme

Seed sources in Central Highlands Eco-region Research Programme

No.	Species	Seed sources(no.)	Area (Ha)	Status
1	<i>Cupressus lusitanica</i>	8	11.2	Seed orchards, some in seed production
2	<i>Eucalyptus grandis</i>	3	5	Seed orchard, old with little seed production
3	<i>Eucalyptus urophylla</i>	6	6	Seed stand, some in seed production
4	<i>Grevillea robusta</i>	6	7	Young seed orchards
5	<i>Pinus patula</i>	4	40	Selected seed sources
	Total	23	69.2	

Seed sources in Drylands Eco-region Research Programme

No.	Species	Seed sources (no.)	Area (Ha)	Status
1	<i>Melia volkensii</i>	2	22	Seed orchard, moderate seed production
	Total	2	22	



Seed sources in Cost Eco-region Research Programme

No.	Species	Seed sources (no.)	Area (Ha)	Status
1	<i>Casuarina equisetifolia</i>	3	4.3	Seed stand, no seed production
2	<i>Eucalyptus camaldulensis</i>	3	4.2	Seed stand, no seed production
3	<i>Melia volkensis</i>	1	1	Seed orchard, not yet seeding (low)
	Total	7	9.5	

Seed sources in Rift Valley and Lake Basin Eco-region Research Programmes

No.	Species	Seed sources (no.)	Area (Ha)	Status
1	<i>Cupressus lusitanica</i>	14	28.3	Seed orchards, some in seed production
2	<i>Pinus patula</i>	12	22.5	Seed orchards, some in seed production
3	<i>Eucalyptus grandis</i>	13	31.5	Seed orchards, good seed production
4	<i>Eucalyptus camaldulensis</i>	3	3.5	Seed stand, moderate seed production
5	<i>Grevillea robusta</i>	5	16.5	Seed orchards, no seed production

Other institutions dealing with propagation materials

Institution

1. Tree Biotechnology Programme Trust(TBPT)
2. Better Globe Forestry
3. KOMAZA
4. AGRIFOR Seeds and Seedlings
5. Aberdare Technologies
6. James Finlay
7. Unilever
8. Williamson Tea
9. African Forest
10. Kakuzi

Recommendations

- Establish new seed sources especially *Pinus patula*, *Casuarina jughuniana*, *Casuarina* and *Eucalyptus urophylla* to increase seed production
- There is need to identify suitable sites for establishing *Grevillea robusta* and *C. equisetifolia*
- Need for management protocols for all seed sources including isolation distance
- Establish fewer and larger seed orchards in good seed production areas since they are more economical and easier to manage
- **Access of propagation materials from private companies**

THANK YOU

