

Appendix 1. List of species evaluated in seeding field trials in Brazil, in order of decreasing establishment percentage (Source: Souza (2023)).

Species	Family	Functional traits ^e										E% ^f SD	Biome ^g	Forest type ^g	
		GR	DS	SM ^a	SH ^b	SW ^c	GS ^d	ST	PC	EC	FC				
<i>Aspidosperma macrocarpon</i> Mart. & Zucc.	Apocynaceae	Sl	Wi	1.43	Ro	8.3	25.0	Or	Ep	Ph	Ph	No	40.35	CE	FS
<i>Cassia grandis</i> L. f.	Fabaceae	Fa	Se	0.53	Ov	16.2	34.0	Or	Ep	Ph	St	Yes	38.80	AM, CE, AF, PT	GF, UAF, SSF, DR
<i>Sapindus saponaria</i> L.	Sapindaceae	Sl	An	3.85	Ro	17.0	30.0	Or	Hy	Cr	St	No	35.06	AM, CE, AF, PT	GF, UAF, SSF, DR
<i>Magonia pubescens</i> A. St.-Hil.	Sapindaceae	Sl	Wi	2.22	Ro	9.6	27.5	Or	Hy	Ph	St	No	34.55	AM, CA, CE	FS, SSF
<i>Mabea fistulifera</i> Mart.	Euphorbiaceae	Fa	Se	0.09	Fl	6.5	25.5	Or	Ep	Ph	Ph	No	34.45	AM, CA, CE, AF	FS, GF, UAF, SDF, DR, AF
<i>Enterolobium gummiferum</i> (Mart.) J. F. Macbr.	Fabaceae	Sl	An	0.51	Fl	9.9	10.5	Or	Ep	Ph	St	Yes	33.78	AM, CE	FS
<i>Hymenaea stigonocarpa</i> Mart.	Fabaceae	Fa	An	4.00	Fl	11.8	34.5	Or	Ep	Ph	St	Yes	32.05	AM, CA, CE, PT	FS, SSF
<i>Hymenaea courbaril</i> L.	Fabaceae	Sl	An	5.07	Fl	11.4	36.0	Or	Ep	Ph	St	Yes	25.85	AM, CA, CE, AF, PT	FS, GF, UAF, DR
<i>Eugenia uniflora</i> L.	Myrtaceae	Sl	An	0.44	Fl	50.0	26.0	Re	Hy	Cr	St	No	25.80	CA, CE, AF, PA	FS, GF, SEF, SSF, DR, AF
<i>Qualea grandiflora</i> Mart.	Vochysiaceae	Sl	Wi	0.19	Ro	10.4	28.0	Re	Ep	Ph	Ph	No	24.22	AM, CA, CE, AF, PT	FS
<i>Tabebuia aurea</i> (Silva Manso) Benth. & Hook. f. ex S. Moore	Bignoniaceae	Sl	Wi	0.16	Ro	2.9	11.0	Or	Hy	Ph	St	No	21.56	AM, CA, CE, AF, PT	FS, SDF, DR
<i>Dipteryx alata</i> Vogel	Fabaceae	Fa	An	1.22	Fl	6.3	25.0	Or	Ep	Ph	St	Yes	21.32	CE	FS, GF, SSF
<i>Eugenia dysenterica</i> (Mart.) DC.	Myrtaceae	Sl	An	0.67	Fl	33.2	22.5	Re	Hy	Cr	St	No	21.30	CA, CE, AF	FS
<i>Enterolobium contortisiliquum</i> (Vell.) Morong	Fabaceae	Fa	An	0.19	Fl	5.8	32.0	Or	Ep	Ph	St	Yes	20.90	CA, CE, AF, PA, PT	FS, GF, SSF, DR
<i>Copaifera langsdorffii</i> Desf.	Fabaceae	Sl	An	0.47	Fl	8.1	36.0	Or	Ep	Ph	St	Yes	20.88	AM, CA, CE, AF	FS, GF, UAF, SSF, DR
<i>Handroanthus serratifolius</i> (Vahl) S. Grose	Bignoniaceae	Sl	Wi	0.04	Ro	5.7	19.0	Or	Hy	Ph	St	No	20.87	AM, CA, CE, AF, PT	UAF, SEF, DR, AF
<i>Kielmeyera coriacea</i> Mart. & Zucc.	Calophyllaceae	Sl	Wi	0.06	Ro	6.9	37.5	Or	Ep	Ph	Ph	No	18.98	AM, CE	FS
<i>Libidibia ferrea</i> (Mart. ex Tul.) L. P. Queiroz	Fabaceae	Sl	Wi	0.02	Fl	8.6	37.5	Or	Ep	Ph	Ph	Yes	16.89	CA, CE, AF	GF, SDF, SSF, DRF
<i>Ceiba speciosa</i> (A. St.-Hil.) Ravenna	Malvaceae	Sl	Wi	0.14	Ov	16.6	19.0	Or	Ep	Ph	Ph	No	16.58	AM, CA, CE, AF, PA, PT	SSF, DR
<i>Brosimum gaudichaudii</i> Trécul	Moraceae	Sl	An	0.02	Fl	45.8	35.0	Or	Hy	Cr	St	No	15.07	AM, CA, CE, AF	FS
<i>Peltophorum dubium</i> (Spreng.) Taub.	Fabaceae	Fa	Wi	0.05	Ov	13.3	33.0	Or	Ep	Ph	Ph	Yes	14.42	CA, CE, AF, PT	FS, GF, SDF, SSF, DRF, AF
<i>Vatairea macrocarpa</i> (Benth.) Ducke	Fabaceae	Sl	Wi	1.43	Ov	6.6	28.0	Or	Hy	Ph	St	Yes	14.16	AM, CA, CE	FS

Appendix 1. (continued)

Species	Family	Functional traits ^e											E% ^f SD	Biome ^g	Forest type ^g
		GR	DS	SM ^a	SH ^b	SW ^c	GS ^d	ST	PC	EC	FC				
<i>Senna alata</i> (L.) Roxb.	Fabaceae	Fa	Se	0.03	Ov	7.8	30.0	Or	Ep	Ph	Ph	No	12.90	AM, CA, CE, AF, PT	FS, UAF, SSF, DR, AF
<i>Cedrela fissilis</i> Vell.	Meliaceae	Sl	Wi	0.04	Ro	10.7	40.0	Or	Ep	Ph	Ph	No	12.66	AM, CA, CE, AF, PA, PT	FS, UAF, SDF, SEF, SSF, DRF
<i>Terminalia corrugata</i> (Ducke) Gere & Boatwr.	Combretaceae	Sl	Se	0.37	Fl	16.4	17.5	Or	Ep	Ph	Ph	Yes	11.64	AM, CA, CE	FS, DRF
<i>Plathymenia reticulata</i> Benth.	Fabaceae	Sl	Wi	0.10	Ov	9.1	17.5	Or	Ep	Ph	St	No	11.43	AM, CA, CE, AF	FS, GF, SSF, DRF
<i>Anadenanthera colubrina</i> (Vell.) Brenan	Fabaceae	Sl	Se	0.11	Ro	8.2	16.5	Or	Hy	Ph	St	No	11.28	CA, CE, AF	FS, SSF, DRF
<i>Parapiptadenia rigida</i> (Benth.) Brenan	Fabaceae	Sl	Se	0.03	Ro	9.9	21.5	Re	Ep	Ph	Ph	No	11.20	AF, PA	SDF, SSF, DRF
<i>Eriotheca pubescens</i> (Mart. & Zucc.) Schott & Endl.	Malvaceae	Sl	Wi	0.15	Fl	5.7	25.0	Or	Hy	Ph	St	No	11.19	CE	FS
<i>Senna multijuga</i> (Rich.) S. S. Irwin & Barneby	Fabaceae	Fa	Wi	0.02	Fl	–	25.0	Or	Ep	Ph	Ph	Yes	10.55	AM, CA, CE, AF	FS, GF, UAF, SSF, DRF
<i>Bowdichia virgilioides</i> Kunth	Fabaceae	Sl	Wi	0.03	Fl	7.5	17.5	Or	Ep	Ph	Ph	Yes	10.54	AM, CA, CE, AF, PT	FS, GF, SEF, SSF
<i>Astronium fraxinifolium</i> Schott	Anacardiaceae	Sl	Wi	0.03	Ro	10.7	24.0	Or	Ep	Ph	Ph	No	10.18	AM, CE, AF	FS, SSF, GF
<i>Dalbergia miscolobium</i> Benth.	Fabaceae	Sl	Wi	0.05	Ro	7.1	17.5	Re	Ep	Ph	St	No	10.10	CE	FS, GF, SDF, SSF
<i>Solanum lycocarpum</i> A. St.-Hil.	Solanaceae	Fa	An	0.01	Ro	8.3	14.0	Or	Ep	Ph	Ph	No	9.28	CE, AF	FS, GF, SDF, SSF, DRF
<i>Piptadenia gonoacantha</i> (Mart.) J. F. Macbr.	Fabaceae	Fa	Se	0.05	Ro	–	19.0	Or	Ep	Ph	Ph	No	9.14	CE, AF	FS, GF, SSF, DRF, SDF
<i>Enterolobium schomburgkii</i> (Benth.) Benth.	Fabaceae	Sl	Se	0.28	Ov	–	16.0	Or	Ep	Ph	St	Yes	8.97	AM, CE	FS, GF, UAM
<i>Astronium urundeuva</i> (M. Allemão) Engl.	Anacardiaceae	Sl	Wi	0.02	Fl	12.0	22.5	Or	Ep	Ph	Ph	Yes	8.63	CA, CE, AF, PA, PT	FS, SDF, SSF,
<i>Senna macranthera</i> (DC. ex Collad.) H.S. Irwin & Barneby	Fabaceae	Fa	An	0.03	Ov	–	15.5	Or	Ep	Ph	Ph	Yes	8.19	CA, CE, AF	FS, GF, SDF, SSF, DRF, AF
<i>Schizolobium parahyba</i> (Vell.) Blake	Fabaceae	Fa	Se	2.00	Fl	–	20.0	Or	Ep	Ph	Ph	Yes	8.03	AM, AF	SSF, DRF GF, UAF
<i>Stryphnodendron adstringens</i> (Mart.) Coville	Fabaceae	Sl	Se	0.11	Ov	7.4	17.5	Or	Ep	Ph	St	Yes	7.75	CA, CE	FS
<i>Tachigali vulgaris</i> L. G. Silva & H. C. Lima	Fabaceae	Sl	Wi	0.07	–	–	–	Or	Ep	Ph	Ph	Yes	7.52	AM, CA, CE	FS, SDF, SSF
<i>Platypodium elegans</i> Benth.	Fabaceae	Sl	Wi	1.08	Ro	11.1	37.5	Or	Hy	Cr	St	No	6.70	AM, CA, CE, AF	FS, GF, UAF, SDF, SSF, DRF
<i>Bauhinia forficata</i> Link	Fabaceae	Fa	Se	0.19	Ov	–	20.0	Or	Ep	Ph	Ph	No	6.11	AF, PA	GF, SSF, DRF, AF

Appendix 1. (continued)

Species	Family	Functional traits ^e											E% ^f SD	Biome ^g	Forest type ^g
		GR	DS	SM ^a	SH ^b	SW ^c	GS ^d	ST	PC	EC	FC				
<i>Senegalia polyphylla</i> (DC.) Britton & Rose	Fabaceae	Fa	Se	0.11	Ov	9.1	11.0	Or	Ep	Ph	St	No	5.75	AM, CA, CE, AF, PT	FS, GF, UAF, SSF, DRF
<i>Croton floribundus</i> Spreng.	Euphorbiaceae	Fa	Se	0.04	Ro	–	47.0	Or	Ep	Ph	Ph	No	5.54	AF	GF, SSF, DRF
<i>Caryocar brasiliense</i> Cambess.	Caryocaraceae	Sl	An	6.90	Fl	7.1	40.0	Re	Hy	Cr	St	Yes	5.10	AM, CA, CE, AF	FS
<i>Ormosia arborea</i> (Vell.) Harms	Fabaceae	Sl	An	1.33	Fl	–	55.5	Or	Hy	Ph	St	Yes	4.93	CE, AF	SSF, DRF
<i>Amburana cearensis</i> (Allemão) A. C. Sm.	Fabaceae	Sl	Wi	0.60	Ov	6.8	16.5	Or	Hy	Cr	St	Yes	4.86	CA, CE, AF, PT	FS, SDF, SSF
<i>Myroxylon peruiferum</i> L. f.	Fabaceae	Sl	Wi	0.44	Ov	–	12.5	Or	Hy	Cr	St	No	4.71	CE, AF	GF, SDF, SSF, DRF, AF
<i>Solanum granuloseprosum</i> Dunal	Solanaceae	Fa	An	0.01	–	–	–	Or	Ep	Ph	Ph	Yes	4.70	CE, AF PA	FS, GF, SDF, SSF, DRF, AF
<i>Schinus terebinthifolia</i> Raddi	Anacardiaceae	Fa	An	0.01	Fl	12.6	40.0	Or	Ep	Ph	Ph	No	4.33	CA, CE, AF, PA	FS, GF, SSF, DRF, AF
<i>Eremanthus glomerulatus</i> Less.	Asteraceae	Fa	Wi	0.01	–	–	–	Or	–	–	–	Yes	4.12	CE	FS
<i>Allophylus edulis</i> (A. St.-Hil. et al.) Hieron. ex Niederl.	Sapindaceae	Fa	An	0.03	Fl	–	26.5	Re	Ep	Ph	Ph	No	4.03	AM, CA, CE, AF, PA, PT	FS, GF, UAF, SSF, SDF, DRF, AF
<i>Dimorphandra mollis</i> Benth.	Fabaceae	Sl	An	0.17	Ov	4.6	22.5	Or	Ep	Ph	Ph	Yes	4.03	AM, CE, PT	FS, GF, SSF
<i>Pterogyne nitens</i> Tul.	Fabaceae	Sl	Wi	0.09	Ro	–	38.0	Or	Ep	Ph	Ph	Yes	3.68	CA, CE, AF	SDF, SSF
<i>Terminalia argentea</i> Mart.	Combretaceae	Fa	Wi	0.36	Ro	9.1	37.5	Or	Hy	Ph	St	No	3.41	AM, CA, CE, AF	FS, GF, SSF
<i>Hancornia speciosa</i> Gomes	Apocynaceae	Sl	An	0.14	Fl	18.5	26.5	Re	Ep	Ph	Ph	No	2.74	AM, CA, CE, AF	FS UAF, SDF, S
<i>Guazuma ulmifolia</i> Lam.	Malvaceae	Fa	An	0.01	Fl	8.8	30.0	Or	Ep	Ph	Ph	Yes	2.72	AM, CA, CE, AF, PA, PT	FS, UAF, SDF, SSF, DRF, AF
<i>Trema micrantha</i> (L.) Blume	Cannabaceae	Fa	An	<0.01	Fl	–	96.0 0	Or	Ep	Ph	Ph	Yes	2.25	AM, CA, CE, AF, PA, PT	GF, SSF, DRF
<i>Cybistax antisiphilitica</i> (Mart.) Mart.	Bignoniaceae	Sl	Wi	0.04	Ro	11.5	35.0	Or	Ep	Ph	St	No	2.10	AM, CA, CE, AF, PA, PT	GF, UAFt, SSF, DRF, AF
<i>Schinopsis brasiliensis</i> Engl.	Anacardiaceae	Sl	Wi	0.15	Ov	10.3	38.0	Re	Ep	Ph	Ph	No	1.98	CA, CE	FS
<i>Mimosa bimucronata</i> (DC.) Kuntze	Fabaceae	Fa	Se	0.01	Ov	–	32.0	Or	Ep	Ph	Ph	Yes	1.87	CA, CE, AF, PA, PT	FS, SSF, DRF
<i>Curatella americana</i> L.	Dilleniaceae	Fa	An	0.02	Fl	13.6	31.0	Or	–	–	–	Yes	1.40	AM, CA, CE, AF	FS, GF
<i>Croton urucurana</i> Baill.	Euphorbiaceae	Fa	Se	0.01	Ro	–	30.0	Or	Ep	Ph	Ph	No	0.81	AM, CE, AF	GF, SSF, DRF
<i>Colubrina glandulosa</i> Perkins	Rhamnaceae	Fa	Se	0.02	Fl	15.9	37.0	Or	Ep	Ph	Ph	Yes	0.67	AM, CE, AF	FS, GF, UAF, SSF, DRF
<i>Genipa americana</i> L.	Rubiaceae	Sl	An	0.08	Ov	42.4	51.5	Or	Ep	Ph	Ph	No	0.26	AM, CA, CE, AF, PT	FS, GF, UAF, SDF, SSF, SEF, DRF

Appendix 1. (continued)

Species	Family	Functional traits ^e											E% ^f SD	Biome ^g	Forest type ^g
		GR	DS	SM ^a	SH ^b	SW ^c	GS ^d	ST	PC	EC	FC				
<i>Cordia trichotoma</i> (Vell.) Arráb. ex. Steud.	Boraginaceae	Sl	Wi	0.05	Fl	51.7	72.0	Re	Ep	Ph	Ph	No	0.23	CA, CE, AF, PA	FS, SDF, SSF, DRF
<i>Lafoensia pacari</i> A. St.-Hil.	Lythraceae	Sl	Wi	0.03	Ro	17.5	34.5	Or	Ep	Ph	Ph	No	0.22	CE	FS, GF
<i>Citharexylum myrianthum</i> Cham.	Verbenaceae	Fa	An	0.06	Ov	14.2	45.0	Or	Ep	Ph	Ph	No	0.18	CA, CE, AF, PA	GF, SSF, DRF, AF
<i>Heliocarpus popayanensis</i> Kunth	Malvaceae	Fa	Wi	<0.01	Ro	–	35.0	Re	Ep	Ph	Ph	Yes	0.17	AM, CE, AF	DRF
<i>Annona crassiflora</i> Mart.	Annonaceae	Sl	An	0.50	Fl	7.1	–	Or	Hy	Cr	St	No	0.07	AM, CE, PT	FS
<i>Cecropia pachystachya</i> Trécul	Urticaceae	Fa	An	<0.01	Fl	–	32.5	Or	Ep	Ph	Ph	No	0.00	AM, CA, CE, AF, PA, PT	FS, GF, SSF, DRF, AF
<i>Handroanthus chrysotrichus</i> (Mart. ex DC.) Mattos	Bignoniaceae	Sl	Wi	0.02	Ro	–	39.0	Or	Ep	Ph	St	No	0.00	CE, AF, PA	FS, DRF
<i>Luehea divaricata</i> Mart. & Zucc.	Malvaceae	Fa	Wi	0.06	Ov	15.6	20.5	Or	Ep	Ph	Ph	No	0.00	CA, CE, AF, PA, PT	FS, GF, SDF, SSF
<i>Tachigali aurea</i> Tull	Fabaceae	Sl	Wi	0.09	–	–	28.0	Or	Ep	Ph	Ph	Yes	0.00	CE	FS, GF
<i>Zanthoxylum rhoifolium</i> Lam.	Rutaceae	Sl	An	0.02	Fl	11.2	80.0	Or	Ep	Ph	Ph	Yes	0.00	AM, CA, CE, AF, PA, PT	FS, GF, UAF, SSF, SDF, DRF

^a Mass of one seed (g). ^b Variance of three seed dimensions (length, width, and thickness) after each value was divided by the largest: flat ≤ 0.09 , oval = 0.09 to 0.20, and round ≥ 0.20 . ^c Amount of water in the seed (%). ^d Median of minimum and maximum germination days (days). ^e Functional traits were obtained from the literature (Carvalho 2003, 2006, 2008; Ressel et al. 2004; Mori et al. 2012; Frigieri et al. 2016; Souza-Júnior and Brancalion 2016; Zambrano 2017; Consolaro et al. 2019; Ribeiro et al. 2022). **Functional traits:** *Growth rate* (GR): Fa (fast) or Sl (slow); *Seed dispersal syndrome* (DS): An (animal-dispersed), Se (self-dispersed), or Wi (wind-dispersed); *Seed mass* (SM), g; *Seed shape* (SH): Fl (flat), Ov (oval), or Ro (round); *Seed water content* (SW), %; *Germination speed* (GS), days; *Seed storage class* (ST): Or (orthodox) or Re (recalcitrant); *Position of cotyledons* (PC): Ep (epigeal) or Hy (hypogeal); *Exposition of cotyledons* (EC): Ph (phanerocotylar, expanded and exposed during germination) or Cr (cryptocotylar, not expanded during germination); *Function of cotyledons* (FC): Ph (photosynthetic) or St (storage); *Seed dormancy* (SD): Yes or No; **E%:** percent establishment; **Biome:** (AM) Amazon, (CA) Caatinga, (CE) Cerrado, (AF) Atlantic Forest, (PA) Pampa, or (PT) Pantanal; **Forest type:** (FS) Forested Savanna, (GF) Gallery Forest, (UAF) Upland Amazon Forest, (SSF) Seasonal Semideciduous Forest, (DRF) Dense Rainforest, (SDF) Seasonal Deciduous Forest, (AF) Araucaria Forest, or (SEF) Seasonal Evergreen Forest. ^f Percentage of established seedlings in the field, in relation to the number of seed sown. ^g JBRJ (2024), available at <https://floradobrasil.jbrj.gov.br> (last accessed 27 Jan. 2025).

Notes: Tree nomenclature follows that of Reflora Project, Rio de Janeiro Botanical Garden (<https://floradobrasil.jbrj.gov.br>, last accessed 27 Jan. 2025). Additional species not listed by Souza (2023) but reported by Caminhos da Semente (<https://www.caminhosdasemente.org.br/especies>) as having between 20% and 60% field establishment rate include taxa from several Families: Anacardiaceae: *Anacardium occidentale* L.; Bignoniaceae: *Handroanthus ochraceus* (Cham.) Mattos; Bixaceae: *Bixa orellana* L.; Boraginaceae: *Cordia alliodora* (Ruiz & Pav.) Cham.; Fabaceae: *Dipteryx odorata* (Aubl.) Willd., *Hymenaea martiana* Hayne, *Machaerium pedicellatum* Vogel, *Piptadenia macradenia* Benth, *Schizolobium parahyba* var. *amazonicum* (Huber ex Ducke) Barneby, *Tachigali subvelutina* (Benth.) Oliveira Filho; Loganiaceae: *Strychnos pseudoquina* A. St.-Hil.; Malpighiaceae: *Byrsonima coccolobifolia* Kunth; Malvaceae: *Eriotheca gracilipes* (K.Schum.) A.Robyns, *Pseudobombax grandiflorum* (Cav.) A. Robyns, *Sterculia striata* A. St.-Hil. & Naud., *Sterculia apetala* (Jacq.) H. Karst.