

SELECTED TROPICAL PERENNIAL STAPLE CROPS

Eric Toensmeier

www.perennialsolutions.org

Climates: 1) humid lowlands, 2) subhumid lowlands (monsoon), 3) humid highlands, 4) subhumid highlands, 5a) arid and semi-arid highlands, 5b) arid and semi-arid lowlands

Yes (in bold italics) indicates arid (under 250mm of annual rainfall). *Indicates native to Mesoamerica. The data in the climate columns is not comprehensive – these species are worth trying in other regions, and many not work in all zones of the indicated climate types.

PUR STARCH: starch with under 5% oil or protein, like taro, cassava, yam, and banana.

Latin Name	Common Name	Origin	1	2	3	4	5a	5b	Form	Part Used
<i>*Agave americana</i>	maguey	Mesoamerica					Yes		Succulent	Roasted heart
<i>*Agave cantala</i>	cantalá	Mesoamerica					Yes		Succulent	Roasted heart
<i>*Agave murpheyi</i>	Hohokam agave	SW. N. America					Yes		Succulent	Roasted heart
<i>*Agave salmiana</i>	maguey	Americas					Yes	Yes	Succulent	Roasted heart
<i>*Agave tequilana</i>	tequila agave	Americas					Yes	Yes	Succulent	Roasted heart
<i>Artocarpus altilis</i>	breadfruit	New Guinea, Pacific	Yes						Tree	Fruit
<i>Artocarpus heterophylla</i>	jakfruit	India	Yes	Yes					Tree	Roasted heart
<i>Dioscorea bulbifera</i>	air potato	Asia, Africa, Australia	Yes	Yes	Yes	Yes			Vine	Aerial tuber
<i>Ensete ventricosum</i>	enset	Africa				Yes	Yes		Giant herb	Trunck starch
<i>Metroxylon sagu</i>	sago palm	New Guinea	Yes						Palm	Trunck starch
<i>Musa</i> spp.	banana, plantain	Asia, New Guinea	Yes						Giant herb	Fruit

Climates: 1) humid lowlands, 2) subhumid lowlands (monsoon), 3) humid highlands, 4) subhumid highlands, 5a) arid and semi-arid highlands, 5b) arid and semi-arid lowlands

Yes (in bold italics) indicates arid (under 250mm of annual rainfall). *Indicates native to Mesoamerica. The data in the climate columns is not comprehensive – these species are worth trying in other regions, and many not work in all zones of the indicated climate types.

BALANCED CARBOHYDRATES: starch or sugar with 5-15% protein and/or oil. Similar to maize, rice, wheat.

Latin Name	Common Name	Origin	1	2	3	4	5a	5b	Form	Part Used
<i>*Albizia saman</i>	Tree de lluvia	Americas	Yes	Yes				Yes	Tree	Woody pod
<i>Araucaria angustifolia</i>	pinheiro	S. America		Yes		Yes			Tree	Nut
<i>Araucaria araucana</i>	Monkey puzzle	Chile & Argentina			Yes	Yes			Tree	Nut
<i>Araucaria bidwillii</i>	bunya bunya	Australia	Yes	Yes	Yes	Yes			Tree	Nut
<i>Artocarpus camansi</i>	Breadnut	New Guinea, Pacific	Yes						Tree	Nut
<i>Artocarpus heterophyllus</i>	Jackfruit	India	Yes	Yes					Tree	Nut
<i>Bactris gasipaes</i>	Peach palm	Americas	Yes						Palm	Fruit
<i>Barringtonia edulis</i>	vutu kana	Fiji	Yes						Tree	Nut
<i>Barringtonia novae-hiberniae</i>	Cutnut	New Guinea, W. Pacific	Yes						Tree	Nut
<i>Barringtonia procera</i>	Cutnut	New Guinea, SW Pacific	Yes						Tree	Nut
<i>*Brosimum alicastrum</i>	Ramon	Mesoamerica	Yes	Yes					Tree	Nut
<i>*Brosimum utile</i>	Cow tree	Americas	Yes						Tree	Nut
<i>Ceratonia siliqua</i>	Carob	N. Africa, Mediterranean		Yes			Yes		Tree	Woody pod
<i>Cordeauxia edulis</i>	Yeheb	Somalia						Yes	Shrub	Nut
<i>*Distichlis palmeri</i>	Nipa	Mesoamerica	Yes	Yes					Grass	Grain
<i>Gleditsia triacanthos</i>	Honey locust	USA				Yes	Yes		Tree	Woody pod
<i>Gnetum gnemon</i>	jointfir, bago	Asia	Yes						Tree	Nut
<i>Inocarpus fagifer</i>	Tahitian chestnut	Oceania	Yes						Tree	Nut

<i>Nelumbo nucifera</i>	lotus	Asia, Australia, Middle East	Yes	Yes	Yes	Yes				Aquatic herb	Nut	
<i>Prosopis alba</i>	mesquite	Argentina							Yes	Tree	Woody pod	
<i>Prosopis chilensis</i>	mesquite	S. America							Yes	Tree	Woody pod	
* <i>Prosopis glandulosa</i>	mesquite	USA, Mesoamerica							Yes	Yes	Tree	Woody pod
* <i>Prosopis juliflora</i>	mesquite	Americas							Yes	Tree	Woody pod	
* <i>Prosopis pallida</i>	mesquite	Americas							Yes	Tree	Woody pod	
<i>Quercus ilex</i>	Holm oak	Mediterranean						Yes		Tree	Acorn	
* <i>Quercus insignis</i>	chicalaba	Mesoamerica						Yes		Tree	Acorn	
<i>Treculia africana</i>	African Breadnut	Africa	Yes							Tree	Nut	

Climates: 1) humid lowlands, 2) subhumid lowlands (monsoon), 3) humid highlands, 4) subhumid highlands, 5a) arid and semi-arid highlands, 5b) arid and semi-arid lowlands

Yes (in bold italics) indicates arid (under 250mm of annual rainfall). *Indicates native to Mesoamerica. The data in the climate columns is not comprehensive – these species are worth trying in other regions, and many not work in all zones of the indicated climate types.

PROTEIN: over 16% de protein, less than 15% oil. Like beans.

Latin Name	Common Name	Origin	1	2	3	4	5a	5b	Form	Part Used
<i>Acacia colei</i>	Edible acacia	Australia, Asia						Yes	Shrub	Bean
<i>Acacia cowleana</i>	Edible acacia	Australia						Yes	Shrub	Bean
<i>Acacia holosericea</i>	Edible acacia	Australia		Yes				Yes	Shrub	Bean
<i>Acacia murrayana</i>	Edible acacia	Australia					Yes		Shrub	Bean
<i>Acacia victoriae</i>	Edible acacia	Australia					Yes	Yes	Shrub	Bean
* <i>Brosimum alicastrum</i>	ramón	Mesoamerica	Yes	Yes					Tree	Tree milk
<i>Brosimum paranarioides</i>	leite de amapá	S. America	Yes						Tree	Tree milk
* <i>Brosimum utile</i>	Cow tree	Americas	Yes	Yes					Tree	Tree milk
<i>Cajanus cajan</i>	Perennial pieon pea	India	Yes	Yes	Yes	Yes	Yes	Yes	Shrub	Bean
<i>Canavalia gladiata</i>	Sword bean	Africa, Asia	Yes	Yes	Yes	Yes			Vine	Bean

<i>*Cercidium microphyllum</i>	Paloverde	Mesoamerica							Yes	Tree	Bean
<i>Erythrina edulis</i>	Chachafruto	Andes				Yes				Tree	Bean
<i>Lablab purpureus</i>	Lablab bean	Africa	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Vine	Bean
<i>Manilkara huberi</i>	Tree de vaca	S. America	Yes							Tree	Tree milk
<i>*Parkinsonia aculeata</i>	Espinillo	America tropical							Yes	Tree	Bean
<i>*Phaseolus coccineus</i>	Runner bean	Mesoamerica			Yes	Yes				Vine	Bean
<i>*Phaseolus coccineus</i>	Piloy	Mesoamerica				Yes				Vine	Bean
<i>ssp. polyanthus</i>											
<i>*Phaseolus lunatus</i>	Lima bean	America tropical		Yes		Yes	Yes	Yes	Yes	Vine	Bean
<i>Psophocarpus tetragonobolus</i>	Winged bean	New Guinea to India	Yes		Yes					Vine	Bean
<i>Sphenostylis stenocarpa</i>	African yambean	Africa	Yes	Yes	Yes	Yes				Vine	Bean

Climates: 1) humid lowlands, 2) subhumid lowlands (monsoon), 3) humid highlands, 4) subhumid highlands, 5a) arid and semi-arid highlands, 5b) arid and semi-arid lowlands

Yes (in bold italics) indicates arid (under 250mm of annual rainfall). *Indicates native to Mesoamerica. The data in the climate columns is not comprehensive – these species are worth trying in other regions, and many not work in all zones of the indicated climate types.

PROTEIN-OIL: Over 16% protein *and* over 16% fat. Equivalent to soybean.

Latin Name	Common Name	Origin	1	2	3	4	5a	5b	Form	Part Used
<i>Adansonia digitata</i>	baobab	Africa	Yes	Yes				Yes	Tree	Seed
<i>Anacardium occidentale</i>	Cashew	Brazil		Yes			Yes		Tree	Nut
<i>Blighia sapida</i>	Akee	Africa	Yes						Tree	Fruit
<i>*Carya illinoensis</i>	Pecan	USA, Mesoamerica			Yes	Yes			Tree	Nut
<i>*Carya ovata</i>	Shagbark hickory	USA, Mesoamerica			Yes	Yes			Tree	Nut
<i>Caryodendron orinocense</i>	Inche	S. America	Yes						Tree	Nut
<i>*Chrysobalanus icaco</i>	Cocoplum	America tropical	Yes	Yes					Shrub	Nut

<i>Citrullus colocynthus</i>	Colocynth	Africa to India					Yes	Vine	Seed
* <i>Cucurbita digitata</i>	calabacilla	USA, Mesoamerica					Yes	Vine	Seed
* <i>Cucurbita ficifolia</i>	chilacayote	Mesoamerica		Yes	Yes			Vine	Seed
<i>Cucurbita foetidissima</i>	Buffalo gourd	USA					Yes	Vine	Seed
* <i>Jatropha curcas</i>	Edible jatropha	America tropical	Yes	Yes	Yes		Yes	Shrub	Nut
<i>Juglans neotropica</i>	Andean walnut	South America		Yes	Yes			Tree	Nut
* <i>Juglans olanchana</i>	Nogal	America tropical	Yes	Yes				Tree	Nut
<i>Lecythis corrugata</i>	guacharaco	Amazonia	Yes					Tree	Nut
<i>Lecythis minor</i>	coco de mono	S. America	Yes					Tree	Nut
<i>Lecythis pisonis</i>	sapucaia	Amazonia	Yes					Tree	Nut
<i>Lecythis zabucajo</i>	Monkey pot	S. America	Yes					Tree	Nut
<i>Pachira glabra</i>	Pachira nut	Tropics worldwide	Yes	Yes				Tree	Nut
* <i>Pinus cembroides</i>	Pinyon	Mesoamerica					Yes Yes	Tree	Nut
<i>Pinus monophylla</i>	Pinyon	USA					Yes	Tree	Nut
<i>Pinus pinea</i>	Pinyon	Mediterranean					Yes	Tree	Nut
<i>Pistacia vera</i>	pistachio	Asia			Yes		Yes	Tree	Nut
<i>Plukenetia conophorum</i>	conophor	Africa	Yes					Vine	Nut
<i>Plukenetia volubilis</i>	sacha inchi	S. America	Yes					Vine	Nut
<i>Prunus amygdalus</i>	Almond	Mediterranean				Yes		Tree	Nut
<i>Prunus armeniaca</i>	Alpricot	Eurasia				Yes		Tree	Nut
<i>Psophocarpus tetragonobolus</i>	Winged bean	New Guinea to India	Yes	Yes	Yes	Yes		Vine	Bean
<i>Ricinodendron heudelotii</i>	Djansang	Africa	Yes					Tree	Nut
<i>Salvadora persica</i>	Salvadora	Africa to Pakistan					Yes	Tree	Nut
<i>Schinziophyton rautanenii</i>	Mongongo	Africa to India					Yes	Tree	Nut
<i>Sclerocarya birreya</i>	Marula	Africa					Yes	Tree	Nut

<i>Telfairia pedata</i>	Usyter nut	Africa	Yes	Yes					Vine	Seed
<i>Terminalia catappa</i>	Tropica almond	Pacific islands		Yes				Yes	Tree	Nut
<i>Terminalia kaernbachii</i>	Okari nut	New Guinea	Yes						Tree	Nut
<i>Treculia africana</i>	African breadnut	Africa	Yes						Tree	Nut
<i>Tylosema esculentum</i>	Marama bean	Africa						Yes	Vine	Bean

Climates: 1) humid lowlands, 2) subhumid lowlands (monsoon), 3) humid highlands, 4) subhumid highlands, 5a) arid and semi-arid highlands, 5b) arid and semi-arid lowlands

Yes (in bold italics) indicates arid (under 250mm of annual rainfall). *Indicates native to Mesoamerica. The data in the climate columns is not comprehensive – these species are worth trying in other regions, and many not work in all zones of the indicated climate types.

OIL: Over 16% oil, under 15% protein. Like coconut or olive oil. Those which say “nut” or “fruit” have that part edible, “expressed oil” means the oil is edible but not the fruit, seed, or nut from which it is pressed. Oil can also be pressed from the edible oils nuts and fruits.

Latin Name	Common Name	Origin	1	2	3	4	5a	5b	Form	Part Used
<i>*Acrocomia aculeata</i>	Macauba palm	America tropical	Yes	Yes					Palm	Expressed oil
<i>Argania spinosa</i>	Argania	Morocco						Yes	Tree	Expressed oil
<i>Astrocaryum vulgare</i>	Tucuma palm	S. America	Yes	Yes					Palm	Expressed oil
<i>*Attalea funifera</i>	Piassava palm	America tropical	Yes	Yes					Palm	Expressed oil
<i>Attalea speciosa</i>	Babassu palm	S. America	Yes	Yes					Palm	Expressed oil
<i>Bactris gasipaes</i>	Peach palm	America tropical	Yes						Palm	Expressed oil
<i>Canarium ovatum</i>	Pili Nut	Philippines	Yes						Tree	Nut
<i>*Carya illinoensis</i>	Pecan	USA, Mesoamerica			Yes	Yes			Tree	Nut
<i>*Carya ovata</i>	shagbark hickory	USA, Mesoamerica			Yes	Yes			Tree	Nut
<i>Caryocar brasiliense</i>	Pequi	S. America		Yes				Yes	Tree	Fruit and nut
<i>Caryocar nuciferum</i>	Sourai nut	S. America	Yes						Tree	Fruit and nut

<i>Caryocar villosum</i>	Piquia	S. America	Yes					Tree	Fruit and nut
<i>Cocos nucifera</i>	Coconut	Asia	Yes	Yes				Palm	Nut
<i>Dacryodes edulis</i>	Safou	Africa	Yes	Yes				Tree	Fruit
<i>Elaeis guineensis</i>	African oil palm	Africa	Yes					Palm	Expressed oil
<i>Elaeis oleifera</i>	American oil palm	America tropical	Yes					Palm	Expressed oil
<i>Gevuina avellana</i>	Chilean hazel	Chile			Yes	Yes		Shrub	Nut
<i>*Gossypium spp.</i>	Perennial cotton	Tropics worldwide	Yes	Yes			Yes	Shrub	Expressed oil
<i>*Gustavia superba</i>	membrillo	America tropical	Yes					Tree	Fruit
<i>Irvingia gabonensis</i>	Dika nut	Africa	Yes					Tree	Nut
<i>Iryanthera laevis</i>	Cumala	S. America	Yes					Tree	Fruit
<i>Jubaea chilensis</i>	Chilean wine palm	Chile			Yes	Yes		Palm	Nut
<i>Leopoldinia piassaba</i>	Piassava palm	S. America	Yes					Palm	Expressed oil
<i>Macadamia hildebrandii</i>	Celebes nut	Sulawesi	Yes					Tree	Nut
<i>Macadamia integrifolia</i>	Macadamia	Australia		Yes	Yes	Yes		Tree	Nut
<i>Macadamia terniflora</i>	macadamia	Australia		Yes	Yes	Yes		Tree	Nut
<i>Madhuca longifolia</i>	Butter tree	India					Yes	Tree	Nut
<i>Mauritia flexuosa</i>	Buriti palm	S. America	Yes					Palm	Fruit
<i>Moringa oleifera</i>	Moringa	India	Yes	Yes			Yes	Tree	Expressed oil
<i>Moringa peregrina</i>	Ben tree	Middle East, Africa					Yes	Tree	Expressed oil
<i>Moringa stenopetala</i>	African moringa	Africa	Yes	Yes		Yes	Yes	Tree	Expressed oil
<i>Oenocarpus bataua</i>	Pataua palm	S. America	Yes					Palm	Fruit
<i>Oenocarpus distichus</i>	Bacaba palm	S. America	Yes	Yes				Palm	Expressed oil
<i>Olea europea</i>	Olive	Mediterranean			Yes	Yes	Yes	Tree	Fruit
<i>Pandanus conoideus</i>	Marita	New Guinea,			Yes	Yes		Tree	Fruit

<i>Pandanus julianettii</i>	Karaka	Moluccas New Guinea			Yes	Yes			Tree	Nut
<i>Parajubaea coccooides</i>	Quito palm	Andes				Yes	Yes		Palm	Nut
<i>*Persea americana</i>	Avocado	Mesoamerica	Yes	Yes	Yes	Yes			Tree	Fruit
<i>Sapium sebiferum</i>	Tallow tree	China			Yes	Yes	Yes		Tree	Expressed oil
<i>Syagrus coronata</i>	Ouricury palm	Brazil	Yes	Yes					Palm	Nut
<i>Theobroma cacao</i>	Cacao	America tropical	Yes						Tree	Expressed oil
<i>Theobroma grandiflorum</i>	Cupuacu	America tropical	Yes						Tree	Expressed oil
<i>Vitellaria paradoxa</i>	Shea	Africa		Yes				Yes	Tree	Nut

Climates: 1) humid lowlands, 2) subhumid lowlands (monsoon), 3) humid highlands, 4) subhumid highlands, 5a) arid and semi-arid highlands, 5b) arid and semi-arid lowlands

Yes (in bold italics) indicates arid (under 250mm of annual rainfall). *Indicates native to Mesoamerica. The data in the climate columns is not comprehensive – these species are worth trying in other regions, and many not work in all zones of the indicated climate types.

SUGAR: Sugar sources.

Latin Name	Common Name	Origin	1	2	3	4	5a	5b	Form	Part Used
<i>Arenga pinnata</i>	Sugar palm	Asia	Yes	Yes					Palm	Sap
<i>Borassus flabellifer</i>		Asia	Yes	Yes					Palm	Sap
<i>Nypa fruticans</i>		Asia	Yes						Palm	Sap
<i>Phoenix dactylifera</i>	Date	Middle East						Yes	Palm	Fruit
<i>Saccharum officinarum</i>	Sugar cane	Asia	Yes	Yes	Yes				Giant grass	Extracted sap

