

Alianza
Alliance



Best bet forages species for different edapho-climatic conditions

Mauricio Sotelo, Juan Andrés Cardoso



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Animal productivity in tropical regions is far below than that in temperate regions. One of the reasons behind this, is lack of knowledge of adaptation ranges to different edapho-climatic conditions of different forage species. Forage refers to plant material that is used to feed livestock. We thereby define tropical forages as those often found in lower latitudes (tropics to subtropics) and low elevations (below to 1,850 meters above sea level). The definition of tropical forages is not a botanical one, but rather just a categorization of forages then are often found in warm temperatures (25 – 35 °C). To date, there is a great deal of the information regarding adaptation ranges of tropical forages. However, most of this information is misleading. This has cause a great deal of confusion and inadequate targeting of different species to different edapho-climatic conditions. Poor selection choice often results in low availability of nutritious feed to sustain animal production, and bad “propaganda” for a probably magnificent plant in their own right. Different species almost invariably cover a wide range of climatic conditions. Sometimes, soil properties—not climate—is the most limiting factor for differences in plant distribution. Here we attempted to create ten different scenarios that might apply to different climatic regions, and provide a list of recommended species or best-bets that might work. The list is mostly based form extensive literature search and the use of different selection tools (such as <http://tropicalforages.info>) and expertise.

Scenario 1

Parameters	Recommended species
Intended forage use: long term pasture (> 4 years)	<ul style="list-style-type: none">• <i>Aeschynomene falcata</i>:
Latitude x Altitude: tropics, 0 - 1000 m ASL	<ul style="list-style-type: none">• <i>Arachis paraguariensis</i>:
Rainfall (average annual): range (mm): 700	<ul style="list-style-type: none">• <i>Chamaecrista pilosa</i>:
Soil texture: medium (loam/clay loam)	<ul style="list-style-type: none">• <i>Chamaecrista rotundifolia</i>:
Soil fertility: low / medium	<ul style="list-style-type: none">• <i>Cynodon spp.</i>:
Soil pH: acidic (5.0- 6.5) / neutral	<ul style="list-style-type: none">• <i>Desmodium intortum</i>:
Soil drainage: well drained	<ul style="list-style-type: none">• <i>Leucaena diversifolia</i>:
Level of soil salinity: low / medium	<ul style="list-style-type: none">• <i>Leucaena leucocephala</i>:
Family: grass / legume	<ul style="list-style-type: none">• <i>Megathyrsus maximus</i>:
Life cycle: perennial	<ul style="list-style-type: none">• <i>Megathyrsus maximus x M. infestus</i>:
Defined dry season: Up to 6 months	<ul style="list-style-type: none">• <i>Panicum trichocladum</i>:
Inundation: < 1 week	<ul style="list-style-type: none">• <i>Paspalum notatum</i>:
Stem habit:	<ul style="list-style-type: none">• <i>Urochloa decumbens</i>:
<ul style="list-style-type: none">• erect/semi-erect• prostrate/procumbent• climbing/twining• stoloniferous• rhizomatous	
Grazing pressure: regular	
Shade environment: moderate (30-50% shade)	

Scenario 2

Parameters	Recommended species
Intended forage use: long term pasture (> 4 years)	<ul style="list-style-type: none">• <i>Aeschynomene falcata</i>
Latitude x Altitude:	<ul style="list-style-type: none">• <i>Aeschynomene villosa</i>
<ul style="list-style-type: none">• tropics, 0 - 1000 m ASL• tropics, 1000 - 2000 m ASL• tropics, 2000 - 2500 m ASL• tropics, 2500+ m ASL• subtropics, 0 - 1000 m ASL	<ul style="list-style-type: none">• <i>Arachis glabrata</i>• <i>Arachis paraguariensis</i>• <i>Arachis pintoii</i>• <i>Axonopus compressus</i>• <i>Axonopus fissifolius</i>

- subtropics, 1000 - 2000 m ASL
 - subtropics, 2000+ m ASL
- Rainfall (average annual): range (mm):** 900
Soil texture: light (sand/sandy loam)
Soil fertility: low
Soil pH: strongly acidic (< 5.0) / acidic (5.0- 6.5)
Level of soil salinity: low
Family: grass
Life cycle: annual
Stem habit:
- erect/semi-erect
 - prostrate/procumbent
 - climbing/twining
 - stoloniferous
- Grazing pressure:** light
Frost intensity: light / heavy

- *Calopogonium mucunoides*
- *Centrosema molle*
- *Chamaecrista pilosa*
- *Chamaecrista rotundifolia*
- *Cynodon spp.*
- *Desmodium heterocarpon subsp. heterocarpon*
- *Desmodium heterocarpon subsp. ovalifolium*
- *Desmodium incanum*
- *Desmodium intortum:*
- *Desmodium uncinatum:*
- *Desmodium velutinum:*
- *Ischaemum ciliare:*
- *Ischaemum timorense:*
- *Leucaena diversifolia:*
- *Leucaena leucocephala:*
- *Leucaena spp. hybrids:*
- *Leucaena trichandra:*
- *Megathyrsus maximus:*
- *Megathyrsus maximus x M. infestus:*
- *Melinis minutiflora:*
- *Neonotonia wightii:*
- *Neustanthus phaseoloides:*
- *Panicum trichocladum:*
- *Paspalum atratum:*
- *Paspalum guenoarum:*
- *Paspalum notatum:*
- *Stenotaphrum spp.:*
- *Urochloa brizantha:*
- *Urochloa decumbens:*
- *Urochloa humidicola:*
- *Urochloa spp. hybrids:*
- *Vigna parkeri & V. hosei:*

Scenario 3

Parameters

Intended forage use:

- long term pasture (> 4 years)
- Ley or short term pasture (less than 4 years)
- cut & carry
- conservation (hay/haylage/silage/leaf meal)
- standover forage
- intercropping
- green manure
- ground cover (soil blanketing)
- agroforestry (upper or lower storey)
- land rehabilitation
- hedgerows
- living fence
- irrigated pasture
- browse
- wetland/ponded pasture

Latitude x Altitude:

- tropics, 1000 - 2000 m ASL
- subtropics, 0 - 1000 m ASL
- subtropics, 1000 - 2000 m ASL

Rainfall (average annual): range (mm): 1200

Soil texture: medium (loam/clay loam)

Soil fertility: medium

Soil pH: acidic (5.0- 6.5) / neutral

Recommended species

- *Desmanthus pernambucanus:*
- *Leucaena spp. hybrids:*
- *Paspalum notatum:*
- *Urochloa decumbens:*
- *Urochloa humidicola:*

Soil drainage:

- moderately drained (occasionally waterlogged)
- poorly drained (frequently waterlogged)

Level of soil salinity: medium / high

Family: grass / legume

Life cycle: perennial

Defined dry season: Up to 6 months

Inundation: < 1 month

Grazing pressure: regular

Shade environment: moderate (30-50% shade)

Scenario 4**Parameters**

Intended forage use: cut & carry

Latitude x Altitude:

- tropics, 0 - 1000 m ASL
- tropics, 1000 - 2000 m ASL

Rainfall (average annual): range (mm): 1200

Soil texture:

- light (sand/sandy loam)
- medium (loam/clay loam)

Soil pH: strongly acidic (< 5.0) / acidic (5.0- 6.5)

Family: grass / legume

Life cycle: perennial

Defined dry season: Up to 6 months

Inundation: < 1 week

Grazing pressure: heavy

Recommended species

- *Aeschynomene americana:*
 - *Aeschynomene villosa:*
 - *Albizia lebeck:*
 - *Alysicarpus rugosus:*
 - *Andropogon gayanus:*
 - *Arachis pintoi:*
 - *Cajanus cajan:*
 - *Calliandra calothyrsus:*
 - *Cenchrus ciliaris:*
 - *Cenchrus clandestinus:*
 - *Cenchrus purpureus & hybrids:*
 - *Centrosema macrocarpum:*
 - *Centrosema molle:*
 - *Centrosema pubescens:*
 - *Chamaecrista nictitans:*
 - *Chamaecrista pilosa:*
 - *Chamaecrista rotundifolia:*
 - *Chloris gayana:*
 - *Clitoria ternatea:*
 - *Cytisus proliferus:*
 - *Desmanthus leptophyllus:*
 - *Desmanthus pernambucanus:*
 - *Desmodium intortum:*
 - *Desmodium uncinatum:*
 - *Dichanthium annulatum:*
 - *Dichanthium aristatum:*
 - *Dichanthium caricosum:*
 - *Digitaria eriantha:*
 - *Digitaria milanjana:*
 - *Echinochloa polystachya:*
 - *Flemingia macrophylla:*
 - *Gliricidia sepium:*
 - *Hemarthria altissima:*
 - *Lablab purpureus:*
 - *Leucaena diversifolia:*
 - *Leucaena leucocephala:*
 - *Leucaena spp. hybrids:*
 - *Leucaena trichandra:*
 - *Macroptilium atropurpureum:*
 - *Macroptilium bracteatum:*
 - *Megathyrsus maximus:*
 - *Melinis minutiflora:*
 - *Neonotonia wightii:*
 - *Panicum coloratum:*
 - *Panicum trichocladum:*
 - *Paspalum atratum:*
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- *Paspalum guenoarum*:
- *Paspalum lepton*:
- *Sesbania sesban*:
- *Setaria sphacelata*:
- *Sorghum (perennial)*:
- *Stylosanthes guianensis* var. *guianensis*:
- *Stylosanthes hamata*:
- *Stylosanthes scabra*:
- *Stylosanthes seabrana*:
- *Tripsacum dactyloides*:
- *Urochloa arrecta* & *U. mutica*:
- *Urochloa brizantha*:
- *Urochloa decumbens*:
- *Urochloa humidicola*:
- *Urochloa mosambicensis*:
- *Urochloa oligotricha*:
- *Urochloa ruziziensis*:
- *Urochloa spp. hybrids*

Scenario 5

Parameters	Recommended species
<p>Intended forage use:</p> <ul style="list-style-type: none"> • long term pasture (> 4 years) • Ley or short term pasture (less than 4 years) • cut & carry • conservation (hay/haylage/silage/leaf meal) • standover forage • intercropping • green manure • ground cover (soil blanketing) • agroforestry (upper or lower storey) • land rehabilitation • hedgerows • living fence • irrigated pasture • browse • wetland/ponded pasture <p>Latitude x Altitude: tropics, 0 - 1000 m ASL</p> <p>Rainfall (average annual): range (mm): 2000</p> <p>Soil texture:</p> <ul style="list-style-type: none"> • light (sand/sandy loam) • medium (loam/clay loam) • heavy (heavy clay) <p>Soil fertility: low / medium</p> <p>Soil Ph: strongly acidic (< 5.0) / acidic (5.0- 6.5)</p> <p>Soil drainage: moderately drained (occasionally waterlogged)</p> <p>Life cycle: perennial</p> <p>Defined dry season: Up to 6 months</p> <p>Inundation: < 1 week</p> <p>Grazing pressure: regular</p>	<ul style="list-style-type: none"> • <i>Aeschynomene americana</i>: • <i>Aeschynomene falcata</i>: • <i>Aeschynomene villosa</i>: • <i>Albizia lebbek</i>: • <i>Alysicarpus monilifer</i>: • <i>Alysicarpus rugosus</i>: • <i>Andropogon gayanus</i>: • <i>Arachis glabrata</i>: • <i>Arachis pintoi</i>: • <i>Axonopus compressus</i>: • <i>Axonopus fissifolius</i>: • <i>Bothriochloa bladhii</i> subsp. <i>glabra</i>: • <i>Bothriochloa insculpta</i>: • <i>Bothriochloa pertusa</i>: • <i>Cajanus cajan</i>: • <i>Calliandra calothyrsus</i>: • <i>Calopogonium caeruleum</i>: • <i>Calopogonium mucunoides</i>: • <i>Cenchrus purpureus</i> & <i>hybrids</i>: • <i>Centrosema acutifolium</i>: • <i>Centrosema molle</i>: • <i>Centrosema pubescens</i>: • <i>Chamaecrista nictitans</i>: • <i>Chloris gayana</i>: • <i>Clitoria ternatea</i>: • <i>Codariocalyx gyroides</i>: • <i>Cynodon dactylon</i>: • <i>Cynodon spp.</i>: • <i>Desmanthus leptophyllus</i>: • <i>Desmanthus pernambucanus</i>: • <i>Desmodium cinereum</i>: • <i>Desmodium heterocarpon</i> subsp. <i>heterocarpon</i>: • <i>Desmodium heterocarpon</i> subsp. <i>ovalifolium</i>: • <i>Desmodium heterophyllum</i>: • <i>Desmodium incanum</i>: • <i>Desmodium intortum</i>: • <i>Desmodium uncinatum</i>:

- *Dichanthium annulatum*:
- *Dichanthium caricosum*:
- *Digitaria eriantha*:
- *Digitaria milanjana*:
- *Echinochloa polystachya*:
- *Erythrina poeppigiana*:
- *Flemingia macrophylla*:
- *Gliricidia sepium*:
- *Ischaemum ciliare*:
- *Lablab purpureus*:
- *Leucaena diversifolia*:
- *Leucaena leucocephala*:
- *Leucaena spp. hybrids*:
- *Leucaena trichandra*:
- *Macroptilium atropurpureum*:
- *Macroptilium gracile*:
- *Megathyrsus maximus*:
- *Megathyrsus maximus x M. infestus*:
- *Melinis minutiflora*:
- *Neustanthus phaseoloides*:
- *Panicum trichocladum*:
- *Paspalum atratum*:
- *Paspalum dilatatum*:
- *Paspalum guenoarum*:
- *Paspalum notatum*:
- *Paspalum plicatulum*:
- *Sesbania grandiflora*:
- *Sesbania sesban*:
- *Setaria sphacelata*:
- *Sorghum (perennial)*:
- *Stenotaphrum spp.*:
- *Stylosanthes hamata*:
- *Tripsacum andersonii*:
- *Tripsacum dactyloides*:
- *Urochloa arrecta & U. mutica*:
- *Urochloa brizantha*:
- *Urochloa decumbens*:
- *Urochloa humidicola*:
- *Urochloa oligotricha*:
- *Urochloa ruziziensis*:
- *Urochloa spp. hybrids*:
- *Vigna parkeri & V. hosei*:

Scenario 6

Parameters	Recommended species
Intended forage use: <ul style="list-style-type: none"> • long term pasture (> 4 years) • Ley or short term pasture (less than 4 years) • cut & carry • conservation (hay/haylage/silage/leaf meal) • standover forage • intercropping • green manure • ground cover (soil blanketing) • agroforestry (upper or lower storey) • land rehabilitation • hedgerows • living fence 	<ul style="list-style-type: none"> • <i>Acroceras macrum</i>: • <i>Cenchrus clandestinus</i>: • <i>Cenchrus purpureus & hybrids</i>: • <i>Cynodon spp.</i>: • <i>Desmodium intortum</i>: • <i>Digitaria eriantha</i>: • <i>Digitaria milanjana</i>: • <i>Panicum trichocladum</i>: • <i>Paspalum notatum</i>: • <i>Sorghum (perennial)</i>: • <i>Vigna parkeri & V. hosei</i>:

- irrigated pasture
- browse
- wetland/ponded pasture

Latitude x Altitude:

- tropics, 2000 - 2500 m ASL
- subtropics, 1000 - 2000 m ASL

Rainfall (average annual): range (mm): 3000

Soil texture: medium (loam/clay loam)

Soil fertility: high

Soil pH: acidic (5.0- 6.5) / neutral

Soil drainage:

moderately drained (occasionally waterlogged)

Level of soil salinity

Family: grass / legume

Life cycle: perennial

Inundation: < 1 week

Grazing pressure: regular

Frost intensity: light

Scenario 7

Parameters

Intended forage use:

- long term pasture (> 4 years)
- Ley or short term pasture (less than 4 years)
- cut & carry
- conservation (hay/haylage/silage/leaf meal)
- standover forage
- intercropping
- green manure
- ground cover (soil blanketing)
- agroforestry (upper or lower storey)
- land rehabilitation
- hedgerows
- living fence
- irrigated pasture
- browse
- wetland/ponded pasture

Latitude x Altitude: tropics, 0 - 1000 m ASL

Rainfall (average annual): range (mm): 2000

Soil texture:

- light (sand/sandy loam)
- medium (loam/clay loam)

Soil fertility: low

Soil pH: strongly acidic (< 5.0)

Soil drainage: moderately drained (occasionally waterlogged)

Family: grass / legume

Life cycle: perennial

Defined dry season: Up to 6 months

Recommended species

- *Arachis pintoi*:
- *Axonopus compressus*
- *Calopogonium caeruleum*:
- *Calopogonium mucunoides*:
- *Codariocalyx gyroides*:
- *Desmodium heterocarpon* subsp. *heterocarpon*:
- *Desmodium heterocarpon* subsp. *ovalifolium*:
- *Flemingia macrophylla*:
- *Ischaemum ciliare*:
- *Melinis minutiflora*:
- *Urochloa brizantha*:
- *Urochloa decumbens*:
- *Urochloa humidicola*:
- *Urochloa* spp. hybrids:

Scenario 8

Parameters

Intended forage use:

- long term pasture (> 4 years)
- Ley or short term pasture (less than 4 years)
- cut & carry
- conservation (hay/haylage/silage/leaf meal)
- standover forage
- intercropping

Recommended species

- *Cenchrus clandestinus*:
- *Trifolium* spp. African perennial:

- green manure
- ground cover (soil blanketing)
- agroforestry (upper or lower storey)
- land rehabilitation
- hedgerows
- living fence
- irrigated pasture
- browse
- wetland/ponded pasture

Latitude x Altitude: tropics, 2000 - 2500 m ASL

Rainfall (average annual): range (mm): 2200

Soil texture: medium (loam/clay loam)

Soil fertility: low / medium

Soil pH: strongly acidic (< 5.0) / acidic (5.0- 6.5) / neutral

Soil drainage:

- well drained
- moderately drained (occasionally waterlogged)

Family: grass / legume

Life cycle: perennial

Defined dry season: Up to 6 months

Inundation: < 1 week

Scenario 9

Parameters	Recommended species
<p>Intended forage use:</p> <ul style="list-style-type: none"> • long term pasture (> 4 years) • Ley or short term pasture (less than 4 years) • cut & carry • conservation (hay/haylage/silage/leaf meal) • standover forage • intercropping • green manure • ground cover (soil blanketing) • agroforestry (upper or lower storey) • land rehabilitation • hedgerows • living fence • irrigated pasture • browse • wetland/ponded pasture <p>Latitude x Altitude:</p> <ul style="list-style-type: none"> • tropics, 0 - 1000 m ASL • tropics, 1000 - 2000 m ASL • tropics, 2000 - 2500 m ASL • tropics, 2500+ m ASL • subtropics, 0 - 1000 m ASL • subtropics, 1000 - 2000 m ASL • subtropics, 2000+ m ASL • Rainfall (average annual): range (mm) <p>Soil texture:</p> <ul style="list-style-type: none"> • light (sand/sandy loam) • medium (loam/clay loam) • heavy (heavy clay) <p>Soil fertility: low / medium / high</p> <p>Soil pH:</p> <ul style="list-style-type: none"> • strongly acidic (< 5.0) • acidic (5.0- 6.5) • neutral • alkaline (> 7.5) 	<ul style="list-style-type: none"> • <i>Acroceras macrum</i>: • <i>Aeschynomene americana</i>: • <i>Aeschynomene falcata</i>: • <i>Aeschynomene histrix</i>: • <i>Aeschynomene villosa</i>: • <i>Albizia lebbbeck</i>: • <i>Alysicarpus monilifer</i>: • <i>Alysicarpus rugosus</i>: • <i>Andropogon gayanus</i>: • <i>Arachis glabrata</i>: • <i>Arachis paraguariensis</i>: • <i>Arachis pintoi</i>: • <i>Axonopus compressus</i>: • <i>Axonopus fissifolius</i>: • <i>Bothriochloa bladhii</i> subsp. <i>glabra</i>: • <i>Bothriochloa insculpta</i>: • <i>Bothriochloa ischaemum</i>: • <i>Bothriochloa pertusa</i>: • <i>Cajanus cajan</i>: • <i>Calopogonium caeruleum</i>: • <i>Calopogonium mucunoides</i>: • <i>Cenchrus ciliaris</i>: • <i>Cenchrus clandestinus</i>: • <i>Cenchrus purpureus</i> & hybrids: • <i>Centrosema acutifolium</i>: • <i>Centrosema brasilianum</i>: • <i>Centrosema macrocarpum</i>: • <i>Centrosema molle</i>: • <i>Centrosema pubescens</i>: • <i>Centrosema rotundifolium</i>: • <i>Chamaecrista nictitans</i>: • <i>Chamaecrista pilosa</i>: • <i>Chamaecrista rotundifolia</i>: • <i>Chloris gayana</i>: • <i>Clitoria ternatea</i>:

Soil drainage:

- well drained
- moderately drained (occasionally waterlogged)
- poorly drained (frequently waterlogged)

Level of soil salinity: low / medium / high

Family: grass / legume / other

Life cycle: annual / perennial

Defined dry season:

- Up to 6 months
- Greater than 6 months

Inundation: < 1 week / < 1 month / > 1 month

Stem habit:

- erect/semi-erect
- prostrate/procumbent
- climbing/twining
- stoloniferous
- rhizomatous

Grazing pressure: light / regular / heavy

Shade environment:

- moderate (30-50% shade)
- dense (>50% shade)

Frost intensity: light / heavy

- *Codariocalyx gyroides*:
 - *Cratylia argentea*:
 - *Cynodon dactylon*:
 - *Cynodon spp.*:
 - *Desmanthus bicornutus*:
 - *Desmanthus glandulosus*:
 - *Desmanthus leptophyllus*:
 - *Desmanthus pernambucanus*:
 - *Desmanthus pubescens*:
 - *Desmanthus virgatus*:
 - *Desmodium heterocarpon subsp. heterocarpon*:
 - *Desmodium incanum*:
 - *Desmodium intortum*:
 - *Desmodium uncinatum*:
 - *Desmodium velutinum*:
 - *Dichanthium annulatum*:
 - *Dichanthium aristatum*:
 - *Dichanthium caricosum*:
 - *Dichanthium sericeum*:
 - *Digitaria didactyla & D. swazilandensis*:
 - *Digitaria eriantha*:
 - *Digitaria milanjiana*:
 - *Erythrina poeppigiana*:
 - *Flemingia macrophylla*:
 - *Gliricidia sepium*:
 - *Hemarthria altissima*:
 - *Ischaemum ciliare*:
 - *Ischaemum timorense*:
 - *Lablab purpureus*:
 - *Leucaena diversifolia*:
 - *Leucaena leucocephala*:
 - *Leucaena spp. hybrids*:
 - *Leucaena trichandra*:
 - *Listia bainesii*:
 - *Macroptilium atropurpureum*:
 - *Macroptilium bracteatum*:
 - *Macroptilium gracile*:
 - *Megathyrsus maximus*:
 - *Megathyrsus maximus x M. infestus*:
 - *Melinis minutiflora*:
 - *Neonotonia wightii*:
 - *Neustanthus phaseoloides*:
 - *Panicum coloratum*:
 - *Panicum trichocladum*:
 - *Paspalum atratum*:
 - *Paspalum dilatatum*:
 - *Paspalum guenoarum*:
 - *Paspalum lepton*:
 - *Paspalum notatum*:
 - *Paspalum plicatulum*:
 - *Sesbania grandiflora*:
 - *Sesbania sesban*:
 - *Setaria incrassata*:
 - *Setaria sphacelata*:
 - *Sorghum (perennial)*:
 - *Stenotaphrum spp.*:
 - *Stylosanthes capitata*:
 - *Stylosanthes guianensis var. guianensis*:
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- *Stylosanthes guianensis* var. *intermedia*:
- *Stylosanthes hamata*:
- *Stylosanthes macrocephala*:
- *Stylosanthes scabra*:
- *Stylosanthes seabrana*:
- *Teramnus labialis*:
- *Trifolium* spp. African perennial:
- *Tripsacum andersonii*:
- *Tripsacum dactyloides*:
- *Urochloa brizantha*:
- *Urochloa decumbens*:
- *Urochloa humidicola*:
- *Urochloa mosambicensis*:
- *Urochloa oligotricha*:
- *Urochloa ruziziensis*:
- *Urochloa* spp. hybrids:
- *Urochloa subquadripara*:
- *Vigna oblongifolia*:
- *Vigna parkeri* & *V. hosei*:

Scenario 10

Parameters

Intended forage use: long term pasture (> 4 years)

Latitude x Altitude: tropics, 0 - 1000 m ASL

Recommended species

- *Aeschynomene falcata*:
- *Andropogon gayanus*:
- *Bothriochloa bladhii* subsp. *glabra*:
- *Bothriochloa pertusa*:
- *Cenchrus ciliaris*:
- *Cenchrus pennisetiformis*:
- *Cenchrus purpureus* & hybrids:
- *Cenchrus setigerus*:
- *Centrosema pascuorum*:
- *Chamaecrista pilosa*:
- *Chamaecrista rotundifolia*:
- *Chloris gayana*:
- *Clitoria ternatea*:
- *Cynodon* spp.:
- *Digitaria eriantha*:
- *Digitaria milanjana*:
- *Leucaena diversifolia*:
- *Leucaena leucocephala*:
- *Macroptilium atropurpureum*:
- *Macroptilium bracteatum*:
- *Macroptilium lathyroides*:
- *Macrotyloma daltonii*:
- *Megathyrsus maximus*:
- *Megathyrsus maximus* x *M. infestus*:
- *Opuntia ficus-indica*:
- *Panicum coloratum*:
- *Sorghum* (perennial):
- *Stylosanthes capitata*:
- *Stylosanthes hamata*:
- *Stylosanthes humilis*:
- *Stylosanthes macrocephala*:
- *Stylosanthes scabra*:
- *Stylosanthes seabrana*:
- *Urochloa mosambicensis*:
- *Urochloa oligotricha*: