

Table 1: Summary of the general habitat information for all the sampling localities as well as observed features of the maize fields and adjacent semi-natural marginal and rangeland vegetation. Biome and vegetation unit according to Mucina & Rutherford (2006)\*.

<b>(a) Grassland</b>		Amersfoort	Cala	Potchefstroom
Habitat information	Sampling date	12–13 Feb 2010	20–21 Mar 2012	25 Feb–2 Mar 2010
	Vegetation unit	Amersfoort Highveld Clay Grassland	Tsomo Grassland	Rand Highveld Grassland
	Altitude (m a.s.l.)	1689–1747	836–916	1407–1490
	MAP (mm)	694	609	654
	MAT (°C)	14	15.2	15.8
	MFD (<0°C)	42	28	28
	SMS (%)	74	76	76
Maize fields	Row width (cm)	90–100	100–150	150–200
	Farming type	Commercial	Commercial	Commercial
	Irrigation	No	No	No
	Fertilizer usage	Yes	Yes	Yes
	Herbicide usage	Yes	Yes	Yes
	Insecticide usage	Yes	No	Yes
Uncultivated habitats	Land uses	Grazing (cattle)	Grazing (cattle, horses, sheep) Wood collection	Grazing (cattle)
	Structural features of field boundary	Farm tracks, fences, electricity pylons	Farm tracks, fences	Farm tracks, fences
<b>(b) Savanna</b>		Jacobsdal	Jozini	Thohoyandou
Habitat information	Sampling date	24–25 Feb 2011	10–11 May 2010	3–5 Nov 2009
	Vegetation unit	Kimberly Thornveld	Western Maputaland Clay Bushveld	Makuleke Sandy Bushveld
	Altitude (m a.s.l.)	1144–1172	69–112	613–680
	MAP (mm)	407	597	489
	MAT (°C)	17.2	21.8	21.7
	MFD (<0°C)	33	0	1
Maize fields	SMS (%)	82	78	81
	Row width (cm)	75–100	80–100	90–100
	Farming type	Commercial	Subsistence	Subsistence
	Irrigation	Yes	Yes	Yes
	Fertilizer usage	Yes	Yes	Yes
	Herbicide usage	Yes	Yes	No
Uncultivated habitats	Insecticide usage	No	No	No
	Land uses	Grazing (cattle, sheep)	Grazing (cattle, goats) Wood collection	Grazing (cattle, donkeys) Wood collection
	Structural features of field boundary	Farm tracks, fences	Farm tracks, fences	Farm tracks, fences, water drainage canals

MAP = mean annual precipitation; MAT = mean annual temperature; MFD = mean frost days; SMS = Mean annual soil moisture stress

\* Mucina, L., Rutherford, M.C., 2006. The Vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19, Pretoria.

Table 2: List of plant traits, assigned categories and definitions as well as proposed ecological mechanisms of trait attributes for the species recorded in all localities across the maize field-field margin gradient.

Plant trait	Trait attribute categories	Ecological adaptation
Life form	<ol style="list-style-type: none"> <li>1. <b>Phanerophytes</b> (plants taller than 0.50 m and whose shoots do not die back periodically to that height)</li> <li>2. <b>Chamaephytes</b> (plants smaller than 0.50 m or that die back periodically to that height)</li> <li>3. <b>Hemicryptophytes</b> (periodic shoot reduction to a remnant shoot system so that buds in harsh season are close to soil surface, e.g. many grasses and rosette forbs)</li> <li>4. <b>Therophytes</b> (root and shoot system dies back after seed production and complete whole life cycle in one year)</li> <li>5. <b>Geophytes</b> (perennial plants, usually herbaceous, with renewal buds located on the plant below the soil surface, as on bulbs or rhizomes).</li> </ol>	Plant strategy in relation to climate and disturbance
Growth form	<ol style="list-style-type: none"> <li>1. <b>Rosette forbs</b> (herbaceous plants with leaves emanating basally and spreading obliquely or laterally from a central, lateral stem, close to or on the substrate, around a central axis from which a scape often emanates)</li> <li>2. <b>Erect forbs</b> (herbaceous vegetation with a typical upright growth habit).</li> <li>3. <b>Creepers</b> (typically low-growing plants that creep on the soil surface, often with stolons or rhizomes)</li> <li>4. <b>Tussocks</b> (many leaves from basal meristem forming prominent tufts)</li> <li>5. <b>Multi-stemmed woody</b> (shoots emanate close to substrate level from one to several main stems, at lateral to oblique angles)</li> <li>6. <b>Single-stemmed woody</b> (shoots spread centrally and laterally from a main stem)</li> </ol>	Plant strategy in relation to climate and disturbance
Clonality	<ol style="list-style-type: none"> <li>0. <b>Non-clonal</b></li> <li>1. <b>Clonal aboveground</b> (stolons, gemmiparous, other vegetative buds or plant fragments)</li> <li>2. <b>Clonal belowground</b> (rhizomes, tubers, bulbs, adventitious root buds on main or lateral roots)</li> <li>3. <b>Clonal above and belowground</b></li> </ol>	Resource exploitation
Primary dispersal mode	<ol style="list-style-type: none"> <li>1. <b>Self-dispersal</b> (the seed of fruit has no obvious aid for longer-distance transport and merely falls passively from the plant)</li> <li>2. <b>Wind dispersal</b> (includes minute dust-like seeds, seeds with pappus or other long hairs, ‘balloons’ or comas (trichomes at the end of a seed), flattened fruits or seeds with large ‘wings’, spores of ferns and related species and ‘tumbleweeds’ where the whole plant or infructescence with ripe seeds is rolled over the ground by wind force)</li> <li>3. <b>Endozoochory</b> (Internal animal transport via fleshy, often brightly coloured berries, arillate sees, drupes and big fruits that are evidently eaten by vertebrates such as birds or mammals and pass through the gut before the seed enter the soil elsewhere)</li> <li>4. <b>Exozoochory</b> (External animal transport via fruits or seeds that become attached it animal hairs, feathers, legs and bills, aided by appendages such as hooks, barbs, awns, burs or sticky substances)</li> <li>5. <b>Unspecified</b> (no obvious mode of dispersal, may disperse by means of several of the above mentioned mechanisms)</li> </ol>	Plant range size
Primary pollination vector	<ol style="list-style-type: none"> <li>1. <b>Abiotic</b> (wind)</li> <li>2. <b>Biotic</b> (animals such as insects, birds or mammals)</li> </ol>	Plant range size
Nitrogen-fixing ability	<ol style="list-style-type: none"> <li>0. <b>Absent</b> (no known N-fixing ability)</li> <li>1. <b>Present</b> (plants with known or suspected N-fixing ability due to the presence of root nodules, mostly members of the Fabaceae family)</li> </ol>	Habitat preference
Leaf periodicity	<ol style="list-style-type: none"> <li>0. <b>N/A</b> (herbaceous plants and grasses which die back completely or withdraw energy into remnant root and or shoot systems in harsh season)</li> <li>1. <b>Deciduous leaves</b></li> <li>2. <b>Evergreen leaves</b></li> </ol>	Conservation of nutrients in habitats with environmental stress
Spinescence	<ol style="list-style-type: none"> <li>0. <b>Absent</b> (no spines and/or thorns present)</li> <li>1. <b>Present</b> (spines and/or thorns present)</li> </ol>	Anti-herbivore defence, land use, disturbance such as periodic grazing, persistence after disturbance

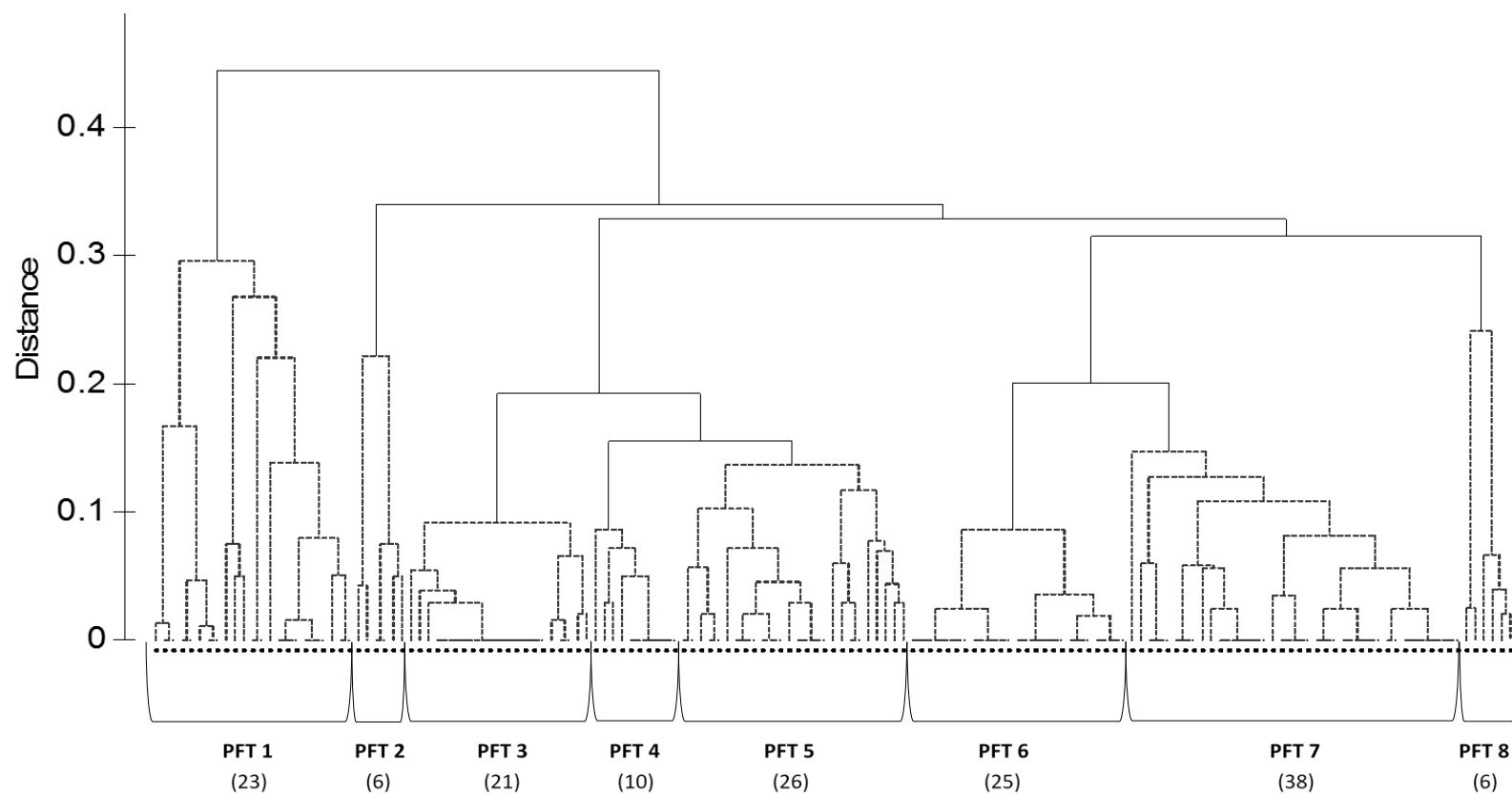


Fig. 1: Cluster analysis (UPGMA) based on Gower distance measure proposing eight major plant functional types (PFTs) from the functional trait composition of species recorded in maize fields and rangeland. Dashed lines in the dendrogram indicate branching with no remaining significant structure, as determined by SIMPROF analysis. Values in parenthesis indicate the number of species representative of each group.

## Appendix A

Table 3: List of the plant species present in 10% or more of the plots in at least one of the distance classes (maize field, marginal vegetation or rangeland), with corresponding plant functional type (PFT) as determined by cluster analysis as well as their functional traits. x indicates presence in grassland and/or savanna habitats.

PFT	Species	Life form	Growth form	Clonality	Dispersal mode	Pollination vector	N-fixing ability	Leaf periodicity	Spinescence	Grassland	Savanna
1	<i>Acalypha glabrata</i>	Phanerophyte	Single-stemmed woody	Non-clonal	Self-dispersal	Biotic	Absent	Evergreen	Absent		x
1	<i>Azelia quanzensis</i>	Phanerophyte	Single-stemmed woody	Non-clonal	Endozoochory	Biotic	Absent	Deciduous	Absent		x
1	<i>Artabotrys brachypetalus</i>	Phanerophyte	Multi-stemmed woody	Non-clonal	Endozoochory	Biotic	Absent	Deciduous	Absent		x
1	<i>Asparagus cooperi</i>	Phanerophyte	Multi-stemmed woody	Non-clonal	Endozoochory	Biotic	Absent	Deciduous	Present		x
1	<i>Bauhinia galpinii</i>	Phanerophyte	Multi-stemmed woody	Clonal belowground	Endozoochory	Biotic	Absent	Evergreen	Absent		x
1	<i>Cissus rotundifolia</i>	Phanerophyte	Multi-stemmed woody	Clonal aboveground	Endozoochory	Biotic	Absent	Evergreen	Absent		x
1	<i>Coddia rudis</i>	Phanerophyte	Multi-stemmed woody	Non-clonal	Endozoochory	Biotic	Absent	Deciduous	Absent		x
1	<i>Dichrostachys cinerea</i>	Phanerophyte	Multi-stemmed woody	Non-clonal	Endozoochory	Biotic	Present	Deciduous	Present		x
1	<i>Diospyros lycioides</i>	Phanerophyte	Multi-stemmed woody	Clonal belowground	Endozoochory	Biotic	Absent	Deciduous	Absent	x	x
1	<i>Ehretia amoena</i>	Phanerophyte	Single-stemmed woody	Non-clonal	Endozoochory	Biotic	Absent	Evergreen	Absent		x
1	<i>Lycium cinereum</i>	Phanerophyte	Multi-stemmed woody	Non-clonal	Endozoochory	Biotic	Absent	Deciduous	Present		x
1	<i>Ochna inermis</i>	Phanerophyte	Single-stemmed woody	Non-clonal	Endozoochory	Biotic	Absent	Deciduous	Absent		x
1	<i>Parinari curatellifolia</i>	Phanerophyte	Single-stemmed woody	Non-clonal	Endozoochory	Biotic	Absent	Evergreen	Absent		x
1	<i>Peltophorum africanum</i>	Phanerophyte	Single-stemmed woody	Non-clonal	Wind dispersal	Biotic	Present	Deciduous	Absent		x
1	<i>Phyllanthus reticulatus</i>	Phanerophyte	Multi-stemmed woody	Non-clonal	Endozoochory	Biotic	Absent	Deciduous	Absent		x
1	<i>Sarcostemma viminale</i>	Phanerophyte	Multi-stemmed woody	Non-clonal	Wind dispersal	Biotic	Absent	Evergreen	Absent		x
1	<i>Senna petersiana</i>	Phanerophyte	Single-stemmed woody	Non-clonal	Wind dispersal	Biotic	Present	Deciduous	Absent		x
1	<i>Tabernaemontana elegans</i>	Phanerophyte	Single-stemmed woody	Non-clonal	Endozoochory	Biotic	Absent	Deciduous	Absent		x
1	<i>Vachellia gerrardii</i>	Phanerophyte	Single-stemmed woody	Non-clonal	Endozoochory	Biotic	Present	Deciduous	Present		x
1	<i>Vachellia karroo</i>	Phanerophyte	Single-stemmed woody	Non-clonal	Endozoochory	Biotic	Present	Deciduous	Present	x	x
1	<i>Vachellia nilotica</i>	Phanerophyte	Single-stemmed woody	Non-clonal	Endozoochory	Biotic	Present	Evergreen	Present		x
1	<i>Vachellia tortilis</i>	Phanerophyte	Single-stemmed woody	Non-clonal	Endozoochory	Biotic	Present	Evergreen	Present	x	x
1	<i>Ziziph mucronata</i>	Phanerophyte	Single-stemmed woody	Non-clonal	Endozoochory	Biotic	Absent	Deciduous	Present		x
2	<i>Argyrolobium pauciflorum</i>	Hemicryptophyte	Erect forb	Non-clonal	Wind dispersal	Biotic	Present	N/A	Absent	x	
2	<i>Crotalaria sphaerocarpa</i>	Therophyte	Erect forb	Non-clonal	Self-dispersal	Biotic	Present	N/A	Absent	x	x
2	<i>Indigofera schimperii</i>	Chamaephyte	Erect forb	Non-clonal	Self-dispersal	Biotic	Present	N/A	Absent		x
2	<i>Lotononis eriantha</i>	Hemicryptophyte	Creepers	Clonal aboveground	Self-dispersal	Biotic	Present	N/A	Absent	x	x

Table 3 cont.

PFT	Species	Life form	Growth form	Clonality	Dispersal mode	Pollination vector	N-fixing ability	Leaf periodicity	Spinescence	Grassland	Savanna
2	<i>Rhynchosia totta</i>	Hemicryptophyte	Creeper	Clonal belowground	Self-dispersal	Biotic	Present	N/A	Absent	x	x
2	<i>Tephrosia capensis</i>	Hemicryptophyte	Erect forb	Non-clonal	Wind dispersal	Biotic	Present	N/A	Absent	x	
3	<i>Abildgaardia ovata</i>	Hemicryptophyte	Tussock	Clonal belowground	Wind dispersal	Abiotic	Absent	N/A	Absent	x	
3	<i>Brachiaria serrata</i>	Hemicryptophyte	Tussock	Clonal belowground	Wind dispersal	Abiotic	Absent	N/A	Absent	x	x
3	<i>Cyperus albostriatus</i>	Hemicryptophyte	Tussock	Clonal belowground	Wind dispersal	Abiotic	Absent	N/A	Absent		x
3	<i>Cyperus esculentus</i>	Geophyte	Tussock	Clonal belowground	Wind dispersal	Abiotic	Absent	N/A	Absent	x	x
3	<i>Cyperus rotundus</i>	Hemicryptophyte	Tussock	Clonal belowground	Wind dispersal	Abiotic	Absent	N/A	Absent	x	x
3	<i>Digitaria eriantha</i>	Hemicryptophyte	Tussock	Clonal above & belowground	Wind dispersal	Abiotic	Absent	N/A	Absent	x	x
3	<i>Eragrostis lehmanniana</i>	Hemicryptophyte	Tussock	Clonal belowground	Unspecified	Abiotic	Absent	N/A	Absent	x	x
3	<i>Heteropogon contortus</i>	Hemicryptophyte	Tussock	Clonal belowground	Exozoochory	Abiotic	Absent	N/A	Absent	x	x
3	<i>Hypparrhenia filipendula</i>	Hemicryptophyte	Tussock	Clonal belowground	Wind dispersal	Abiotic	Absent	N/A	Absent	x	x
3	<i>Hypparrhenia hirta</i>	Hemicryptophyte	Tussock	Clonal belowground	Wind dispersal	Abiotic	Absent	N/A	Absent	x	
3	<i>Kyllinga erecta</i>	Hemicryptophyte	Tussock	Clonal belowground	Wind dispersal	Abiotic	Absent	N/A	Absent	x	
3	<i>Panicum coloratum</i>	Hemicryptophyte	Tussock	Clonal belowground	Unspecified	Abiotic	Absent	N/A	Absent	x	x
3	<i>Panicum maximum</i>	Hemicryptophyte	Tussock	Clonal aboveground	Unspecified	Abiotic	Absent	N/A	Absent		x
3	<i>Panicum schinzii</i>	Therophyte	Tussock	Clonal aboveground	Unspecified	Abiotic	Absent	N/A	Absent	x	x
3	<i>Setaria nigrirostris</i>	Hemicryptophyte	Tussock	Clonal belowground	Wind dispersal	Abiotic	Absent	N/A	Absent	x	x
3	<i>Setaria sphacelata</i>	Hemicryptophyte	Tussock	Clonal belowground	Wind dispersal	Abiotic	Absent	N/A	Absent	x	x
3	<i>Sporobolus africanus</i>	Hemicryptophyte	Tussock	Clonal belowground	Wind dispersal	Abiotic	Absent	N/A	Absent	x	x
3	<i>Sporobolus fimbriatus</i>	Hemicryptophyte	Tussock	Clonal belowground	Wind dispersal	Abiotic	Absent	N/A	Absent	x	x
3	<i>Themeda triandra</i>	Hemicryptophyte	Tussock	Clonal belowground	Wind dispersal	Abiotic	Absent	N/A	Absent	x	x
3	<i>Trachypogon spicatus</i>	Hemicryptophyte	Tussock	Clonal belowground	Wind dispersal	Abiotic	Absent	N/A	Absent	x	
3	<i>Urochloa mosambicensis</i>	Hemicryptophyte	Tussock	Clonal aboveground	Wind dispersal	Abiotic	Absent	N/A	Absent		x
4	<i>Acanthospermum hispidum</i>	Therophyte	Creeper	Clonal aboveground	Exozoochory	Biotic	Absent	N/A	Absent		x
4	<i>Barleria elegans</i>	Chamaephyte	Erect forb	Clonal aboveground	Self-dispersal	Biotic	Absent	N/A	Absent		x
4	<i>Centella asiatica</i>	Hemicryptophyte	Creeper	Clonal above & belowground	Wind dispersal	Biotic	Absent	N/A	Absent	x	
4	<i>Centella glabrata</i>	Hemicryptophyte	Creeper	Clonal aboveground	Self-dispersal	Biotic	Absent	N/A	Absent	x	x

Table 3 cont.

PFT	Species	Life form	Growth form	Clonality	Dispersal mode	Pollination vector	N-fixing ability	Leaf periodicity	Spinescence	Grassland	Savanna
4	<i>Chenopodium carinatum</i>	Therophyte	Creeper	Clonal aboveground	Self-dispersal	Biotic	Absent	N/A	Absent	x	x
4	<i>Commelina africana</i>	Hemicryptophyte	Erect forb	Clonal aboveground	Self-dispersal	Biotic	Absent	N/A	Absent	x	x
4	<i>Commelina benghalensis</i>	Therophyte	Creeper	Clonal aboveground	Self-dispersal	Biotic	Absent	N/A	Absent	x	x
4	<i>Conyza podocephala</i>	Hemicryptophyte	Creeper	Clonal aboveground	Wind dispersal	Biotic	Absent	N/A	Absent	x	
4	<i>Corchorus trilocularis</i>	Hemicryptophyte	Erect forb	Clonal aboveground	Self-dispersal	Biotic	Absent	N/A	Absent		x
4	<i>Cynodon dactylon</i>	Hemicryptophyte	Creeper	Clonal above & belowground	Self-dispersal	Abiotic	Absent	N/A	Absent	x	x
4	<i>Cynodon hirsutus</i>	Hemicryptophyte	Creeper	Clonal aboveground	Self-dispersal	Abiotic	Absent	N/A	Absent		x
4	<i>Euphorbia inaequilatera</i>	Hemicryptophyte	Creeper	Clonal aboveground	Self-dispersal	Biotic	Absent	N/A	Absent	x	x
4	<i>Galenia pubescens</i>	Hemicryptophyte	Creeper	Clonal aboveground	Self-dispersal	Biotic	Absent	N/A	Absent		x
4	<i>Geranium multisectum</i>	Hemicryptophyte	Erect forb	Clonal aboveground	Self-dispersal	Biotic	Absent	N/A	Absent	x	
4	<i>Helichrysum rugulosum</i>	Hemicryptophyte	Erect forb	Clonal belowground	Wind dispersal	Biotic	Absent	N/A	Absent	x	
4	<i>Hermannia depressa</i>	Hemicryptophyte	Creeper	Clonal above & belowground	Self-dispersal	Biotic	Absent	N/A	Absent	x	
4	<i>Hermannia transvaalensis</i>	Hemicryptophyte	Creeper	Clonal belowground	Self-dispersal	Biotic	Absent	N/A	Absent	x	
4	<i>Ipomoea purpurea</i>	Therophyte	Creeper	Clonal aboveground	Wind dispersal	Biotic	Absent	N/A	Absent	x	x
4	<i>Ipomoea sinensis</i>	Therophyte	Creeper	Clonal aboveground	Wind dispersal	Biotic	Absent	N/A	Absent		x
4	<i>Monopsis decipiens</i>	Hemicryptophyte	Erect forb	Clonal aboveground	Self-dispersal	Biotic	Absent	N/A	Absent	x	
4	<i>Phyllanthus incurvus</i>	Hemicryptophyte	Erect forb	Clonal belowground	Endozoochory	Biotic	Absent	N/A	Absent		x
4	<i>Portulaca oleracea</i>	Therophyte	Creeper	Clonal aboveground	Self-dispersal	Biotic	Absent	N/A	Absent	x	x
4	<i>Ruellia cordata</i>	Hemicryptophyte	Erect forb	Clonal above & belowground	Self-dispersal	Biotic	Absent	N/A	Absent		x
4	<i>Senecio ruwenzoriensis</i>	Hemicryptophyte	Rosette forb	Clonal belowground	Wind dispersal	Biotic	Absent	N/A	Absent	x	
4	<i>Tribulus terrestris</i>	Therophyte	Creeper	Clonal aboveground	Exozoochory	Biotic	Absent	N/A	Absent	x	x
4	<i>Vernonia natalensis</i>	Hemicryptophyte	Erect forb	Clonal belowground	Wind dispersal	Biotic	Absent	N/A	Absent	x	
5	<i>Cheilanthes involuta</i>	Geophyte	Rosette forb	Clonal belowground	Self-dispersal	Abiotic	Absent	N/A	Absent		x
5	<i>Hypoxis rigidula</i>	Geophyte	Rosette forb	Clonal belowground	Self-dispersal	Biotic	Absent	N/A	Absent	x	
5	<i>Ipomoea crassipes</i>	Geophyte	Creeper	Clonal belowground	Self-dispersal	Biotic	Absent	N/A	Absent	x	x
5	<i>Ledebouria ovatifolia</i>	Geophyte	Rosette forb	Clonal belowground	Self-dispersal	Biotic	Absent	N/A	Absent	x	
5	<i>Ledebouria revoluta</i>	Geophyte	Rosette forb	Clonal belowground	Self-dispersal	Biotic	Absent	N/A	Absent	x	

## Appendix A

Table3 cont.

PFT	Species	Life form	Growth form	Clonality	Dispersal mode	Pollination vector	N-fixing ability	Leaf periodicity	Spinescence	Grassland	Savanna
5	<i>Oxalis corniculata</i>	Therophyte	Rosette forb	Clonal aboveground	Self-dispersal	Biotic	Absent	N/A	Absent	x	x
5	<i>Oxalis depressa</i>	Geophyte	Rosette forb	Clonal belowground	Self-dispersal	Biotic	Absent	N/A	Absent	x	
5	<i>Oxalis latifolia</i>	Geophyte	Rosette forb	Clonal belowground	Self-dispersal	Biotic	Absent	N/A	Absent	x	x
5	<i>Oxalis obliquifolia</i>	Geophyte	Rosette forb	Clonal belowground	Self-dispersal	Biotic	Absent	N/A	Absent	x	x
5	<i>Sansevieria hyacinthoides</i>	Geophyte	Erect forb	Clonal belowground	Self-dispersal	Biotic	Absent	N/A	Absent		x
6	<i>Aristida adscensionis</i>	Therophyte	Tussock	Non-clonal	Exozoochory	Abiotic	Absent	N/A	Absent		x
6	<i>Aristida congesta</i>	Therophyte	Tussock	Non-clonal	Exozoochory	Abiotic	Absent	N/A	Absent	x	x
6	<i>Cenchrus ciliaris</i>	Hemicryptophyte	Tussock	Non-clonal	Wind dispersal	Abiotic	Absent	N/A	Absent		x
6	<i>Chloris virgata</i>	Therophyte	Tussock	Non-clonal	Wind dispersal	Abiotic	Absent	N/A	Absent	x	x
6	<i>Cymbopogon excavatus</i>	Hemicryptophyte	Tussock	Non-clonal	Wind dispersal	Abiotic	Absent	N/A	Absent	x	x
6	<i>Dichanthium annulatum</i>	Hemicryptophyte	Tussock	Non-clonal	Wind dispersal	Abiotic	Absent	N/A	Absent		x
6	<i>Digitaria sanguinalis</i>	Therophyte	Tussock	Non-clonal	Wind dispersal	Abiotic	Absent	N/A	Absent	x	x
6	<i>Digitaria ternata</i>	Therophyte	Tussock	Non-clonal	Wind dispersal	Abiotic	Absent	N/A	Absent	x	x
6	<i>Eleusine coracana</i>	Therophyte	Tussock	Non-clonal	Unspecified	Abiotic	Absent	N/A	Absent	x	x
6	<i>Elionurus muticus</i>	Hemicryptophyte	Tussock	Non-clonal	Wind dispersal	Abiotic	Absent	N/A	Absent	x	
6	<i>Enneapogon desvauxii</i>	Therophyte	Tussock	Non-clonal	Wind dispersal	Abiotic	Absent	N/A	Absent		x
6	<i>Eragrostis chloromelas</i>	Hemicryptophyte	Tussock	Non-clonal	Unspecified	Abiotic	Absent	N/A	Absent	x	x
6	<i>Eragrostis curvula</i>	Hemicryptophyte	Tussock	Non-clonal	Unspecified	Abiotic	Absent	N/A	Absent	x	x
6	<i>Eragrostis obtusa</i>	Hemicryptophyte	Tussock	Non-clonal	Unspecified	Abiotic	Absent	N/A	Absent	x	x
6	<i>Eragrostis plana</i>	Hemicryptophyte	Tussock	Non-clonal	Unspecified	Abiotic	Absent	N/A	Absent	x	
6	<i>Eragrostis pseud-obtusa</i>	Hemicryptophyte	Tussock	Non-clonal	Unspecified	Abiotic	Absent	N/A	Absent	x	x
6	<i>Eragrostis racemosa</i>	Hemicryptophyte	Tussock	Non-clonal	Unspecified	Abiotic	Absent	N/A	Absent	x	
6	<i>Eragrostis superba</i>	Hemicryptophyte	Tussock	Non-clonal	Wind dispersal	Abiotic	Absent	N/A	Absent		x
6	<i>Melinis repens</i>	Therophyte	Tussock	Non-clonal	Wind dispersal	Abiotic	Absent	N/A	Absent	x	x
6	<i>Microchloa kunthii</i>	Hemicryptophyte	Tussock	Non-clonal	Wind dispersal	Abiotic	Absent	N/A	Absent	x	
6	<i>Setaria verticillata</i>	Therophyte	Tussock	Non-clonal	Exozoochory	Abiotic	Absent	N/A	Absent	x	x
6	<i>Sorghum bicolor</i>	Therophyte	Tussock	Non-clonal	Unspecified	Abiotic	Absent	N/A	Absent	x	x

Table 3 cont.

PFT	Species	Life form	Growth form	Clonality	Dispersal mode	Pollination vector	N-fixing ability	Leaf periodicity	Spinescence	Grassland	Savanna
6	<i>Tragus berteronianus</i>	Therophyte	Tussock	Non-clonal	Exozoochory	Abiotic	Absent	N/A	Absent		x
6	<i>Tristachya leucothrix</i>	Hemicryptophyte	Tussock	Non-clonal	Wind dispersal	Abiotic	Absent	N/A	Absent	x	
6	<i>Urochloa panicoides</i>	Therophyte	Tussock	Non-clonal	Unspecified	Abiotic	Absent	N/A	Absent	x	x
7	<i>Abutilon mauritianum</i>	Chamaephyte	Erect forb	Non-clonal	Wind dispersal	Biotic	Absent	N/A	Absent		x
7	<i>Achyranthes aspera</i>	Chamaephyte	Creepers	Non-clonal	Exozoochory	Biotic	Absent	N/A	Absent		x
7	<i>Ageratum conyzoides</i>	Therophyte	Erect forb	Non-clonal	Exozoochory	Biotic	Absent	N/A	Absent		x
7	<i>Amaranthus hybridus</i>	Therophyte	Erect forb	Non-clonal	Endozoochor	Biotic	Absent	N/A	Absent	x	x
7	<i>Amaranthus viridis</i>	Therophyte	Erect forb	Non-clonal	Endozoochor	Biotic	Absent	N/A	Absent	x	x
7	<i>Anthospermum rigidum</i>	Chamaephyte	Erect forb	Non-clonal	Self-dispersal	Biotic	Absent	N/A	Absent	x	
7	<i>Aster squamatus</i>	Hemicryptophyte	Erect forb	Non-clonal	Wind dispersal	Biotic	Absent	N/A	Absent	x	
7	<i>Bidens pilosa</i>	Therophyte	Erect forb	Non-clonal	Exozoochory	Biotic	Absent	N/A	Absent	x	x
7	<i>Cleome monophylla</i>	Therophyte	Erect forb	Non-clonal	Wind dispersal	Biotic	Absent	N/A	Absent	x	x
7	<i>Conyza bonariensis</i>	Therophyte	Erect forb	Non-clonal	Wind dispersal	Biotic	Absent	N/A	Absent	x	x
7	<i>Crabbea acaulis</i>	Hemicryptophyte	Rosette forb	Non-clonal	Exozoochory	Biotic	Absent	N/A	Absent	x	x
7	<i>Datura stramonium</i>	Therophyte	Erect forb	Non-clonal	Exozoochory	Biotic	Absent	N/A	Absent	x	x
7	<i>Euphorbia heterophylla</i>	Therophyte	Erect forb	Non-clonal	Self-dispersal	Biotic	Absent	N/A	Absent		x
7	<i>Felicia muricata</i>	Chamaephyte	Erect forb	Non-clonal	Wind dispersal	Biotic	Absent	N/A	Absent	x	x
7	<i>Gerbera piloselloides</i>	Hemicryptophyte	Rosette forb	Non-clonal	Wind dispersal	Biotic	Absent	N/A	Absent	x	
7	<i>Helichrysum nudifolium</i>	Hemicryptophyte	Erect forb	Non-clonal	Wind dispersal	Biotic	Absent	N/A	Absent	x	
7	<i>Hermannia parviflora</i>	Hemicryptophyte	Erect forb	Non-clonal	Self-dispersal	Biotic	Absent	N/A	Absent	x	
7	<i>Hibiscus trionum</i>	Therophyte	Erect forb	Non-clonal	Wind dispersal	Biotic	Absent	N/A	Absent	x	x
7	<i>Justicia flava</i>	Chamaephyte	Erect forb	Non-clonal	Self-dispersal	Biotic	Absent	N/A	Absent		x
7	<i>Kyphocarpa angustifolia</i>	Therophyte	Erect forb	Non-clonal	Wind dispersal	Biotic	Absent	N/A	Absent		x
7	<i>Lactuca inermis</i>	Hemicryptophyte	Rosette forb	Non-clonal	Wind dispersal	Biotic	Absent	N/A	Absent	x	x
7	<i>Lantana rugosa</i>	Chamaephyte	Erect forb	Non-clonal	Endozoochory	Biotic	Absent	N/A	Absent		x
7	<i>Lobelia flaccida</i>	Therophyte	Erect forb	Non-clonal	Self-dispersal	Biotic	Absent	N/A	Absent	x	
7	<i>Melhania forbesii</i>	Chamaephyte	Erect forb	Non-clonal	Wind dispersal	Biotic	Absent	N/A	Absent		x



Table 3 cont.

PFT	Species	Life form	Growth form	Clonality	Dispersal mode	Pollination vector	N-fixing ability	Leaf periodicity	Spinescence	Grassland	Savanna
7	<i>Parthenium hysterophorus</i>	Therophyte	Erect forb	Non-clonal	Self-dispersal	Biotic	Absent	N/A	Absent	x	x
7	<i>Pentzia incana</i>	Chamaephyte	Erect forb	Non-clonal	Wind dispersal	Biotic	Absent	N/A	Absent		x
7	<i>Pupalia lappacea</i>	Therophyte	Erect forb	Non-clonal	Exozoochory	Biotic	Absent	N/A	Absent		x
7	<i>Richardia brasiliensis</i>	Hemicryptophyte	Creeper	Non-clonal	Self-dispersal	Biotic	Absent	N/A	Absent	x	x
7	<i>Schkuhria pinnata</i>	Therophyte	Erect forb	Non-clonal	Wind dispersal	Biotic	Absent	N/A	Absent	x	x
7	<i>Selago densiflora</i>	Chamaephyte	Erect forb	Non-clonal	Self-dispersal	Biotic	Absent	N/A	Absent	x	x
7	<i>Sida alba</i>	Therophyte	Erect forb	Non-clonal	Self-dispersal	Biotic	Absent	N/A	Absent	x	x
7	<i>Sida rhombifolia</i>	Therophyte	Erect forb	Non-clonal	Self-dispersal	Biotic	Absent	N/A	Absent		x
7	<i>Solanum nigrum</i>	Therophyte	Erect forb	Non-clonal	Endozoochory	Biotic	Absent	N/A	Absent		x
7	<i>Sonchus nanus</i>	Hemicryptophyte	Rosette forb	Non-clonal	Wind dispersal	Biotic	Absent	N/A	Absent	x	
7	<i>Sonchus oleraceus</i>	Therophyte	Erect forb	Non-clonal	Wind dispersal	Biotic	Absent	N/A	Absent	x	x
7	<i>Tagetes minuta</i>	Therophyte	Erect forb	Non-clonal	Wind dispersal	Biotic	Absent	N/A	Absent	x	x
7	<i>Wahlenbergia stellarioides</i>	Therophyte	Erect forb	Non-clonal	Self-dispersal	Biotic	Absent	N/A	Absent	x	x
7	<i>Xanthium strumarium</i>	Therophyte	Erect forb	Non-clonal	Exozoochory	Biotic	Absent	N/A	Absent	x	x
8	<i>Argemone ochroleuca</i>	Therophyte	Erect forb	Non-clonal	Exozoochory	Biotic	Absent	N/A	Present		x
8	<i>Berkheya pinnatifida</i>	Hemicryptophyte	Erect forb	Non-clonal	Exozoochory	Biotic	Absent	N/A	Present	x	x
8	<i>Berkheya setifera</i>	Hemicryptophyte	Erect forb	Non-clonal	Wind dispersal	Biotic	Absent	N/A	Present	x	
8	<i>Blepharis integrifolia</i>	Hemicryptophyte	Creeper	Non-clonal	Exozoochory	Biotic	Absent	N/A	Present	x	x
8	<i>Mestoklema arboriforme</i>	Chamaephyte	Erect forb	Clonal belowground	Wind dispersal	Biotic	Absent	N/A	Present		x
8	<i>Solanum panduriforme</i>	Hemicryptophyte	Erect forb	Clonal belowground	Wind dispersal	Biotic	Absent	N/A	Present	x	x

Table 4: Summary of the characteristics associated with the 8 plant functional types (PFTs) identified by means of cluster analysis. Bold text indicates the most prominent trait attributes within each functional type. Values in parenthesis indicate the number of species representing each trait attribute.

PFT	Tot. no. spp.	Life form	Growth form	Clonality	Dispersal mode	Pollination vector	N-fixing ability	Leaf periodicity	Spinescence
1	23	<b>Phanerophytes (23)</b>	<b>Single-stemmed woodies (13)</b> Multi-stemmed woodies (10)	<b>Non-clonal (20)</b> Clonal belowground (2) Clonal aboveground (1)	<b>Endozoochory (19)</b> Wind dispersal (3) Self-dispersal (1)	<b>Biotic (23)</b>	<b>Absent (16)</b> Present (7)	<b>Deciduous (15)</b> Evergreen (8)	<b>Absent (15)</b> Present (8)
2	6	<b>Hemicryptophytes (4)</b> Chamaephytes (1) Therophytes (1)	<b>Erect forbs (4)</b> Creepers (2)	<b>Non-clonal (4)</b> Clonal aboveground (1) Clonal belowground (1)	<b>Self-dispersal (4)</b> Wind dispersal (2)	Biotic (6)	Present (6)	N/A	Absent (6)
3	21	<b>Hemicryptophytes (20)</b> Therophytes (1)	Tussocks (21)	<b>Clonal belowground (17)</b> Clonal aboveground (3) Clonal above and belowground (1)	<b>Wind dispersal (16)</b> Unspecified dispersal (4) Exozoochory (1)	Abiotic (21)	Absent (21)	N/A	Absent (21)
4	10	<b>Geophytes (9)</b> Therophytes (1)	<b>Rosette forbs (8)</b> Erect forbs (1) Creepers (1)	<b>Clonal belowground (9)</b> Clonal aboveground (1)	Self-dispersal (10)	<b>Biotic (9)</b> Abiotic (1)	Absent (10)	N/A	Absent (10)
5	26	<b>Hemicryptophytes (18)</b> Therophytes (7) Chamaephytes (1)	<b>Creepers (16)</b> Erect forbs (9) Rosette forbs (1)	<b>Clonal aboveground (17)</b> Clonal belowground (5) Clonal above and belowground (4)	<b>Self-dispersal (16)</b> Wind dispersal (7) Exozoochory (2) Endozoochory (1)	<b>Biotic (24)</b> Abiotic (2)	Absent (26)	N/A	Absent (26)
6	25	<b>Hemicryptophytes (13)</b> Therophytes (12)	Tussocks (25)	Non-clonal (25)	<b>Wind dispersal (12)</b> Unspecified dispersal (9) Exozoochory (4)	Abiotic (25)	Absent (25)	N/A	Absent (25)
7	38	<b>Therophytes (20)</b> Chamaephytes (9) Hemicryptophytes (8)	<b>Erect forbs (32)</b> Rosette forbs (4) Creepers (2)	Non-clonal (38)	<b>Wind dispersal (16)</b> Self-dispersal (11) Exozoochory (7) Endozoochory (4)	Biotic (38)	Absent (38)	N/A	Absent (38)
8	6	<b>Hemicryptophytes (4)</b> Chamaephytes (1) Therophytes (1)	<b>Erect forbs (5)</b> Creepers (1)	<b>Non-clonal (4)</b> Clonal belowground (2)	<b>Wind dispersal (3)</b> Exozoochory (3)	Biotic (6)	Absent (6)	N/A	Present (6)