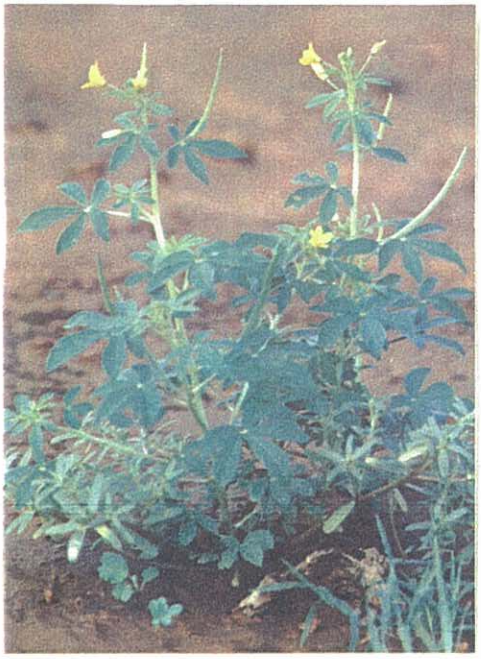
IMPORTANT PASTURE SPECIES OF THE VICTORIA RIVER DISTRICT

By: H.J. Vallance, M.D. Cobiac, R.T. Andison, and T.G.H. Stockwell



Department of
Primary Industry
and Fisheries

Northern Territory of Australia

Department of

PRIMARY INDUSTRY AND FISHERIES

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SUSTAINABLE AGRICULTURE

THE DEPARTMENT OF PRIMARY INDUSTRY AND FISHERIES IS COMMITTED TO THE PRINCIPLES AND PRACTICES OF SUSTAINABLE AGRICULTURE

Definition:

Sustainable agriculture is the use of practices and systems which maintain or enhance:

- the economic viability of agricultural production;
- the natural resource base; and
- other ecosystems which are influenced by agricultural activities.

Principles:

1. Agricultural productivity is sustained or enhanced over the long term.
2. Adverse impacts on the natural resource base of agricultural and associated ecosystems are ameliorated, minimised or avoided.
3. Harmful residues resulting from the use of chemicals for agriculture are minimised.
4. The nett social benefit (in both dollar and non-dollar terms) derived from agriculture is maximised.
5. Agriculture systems are sufficiently flexible to manage risks associated with the vagaries of climate and markets.

SUSTAINABLE AGRICULTURE IN THE NORTHERN TERRITORY

IMPORTANT PASTURE SPECIES OF THE VICTORIA RIVER DISTRICT

By: H.J.Vallance, M.D.Cobiac, R.T.Andison and T.G.H.Stockwell

Information compiled by Officers of the
Department of Primary Industry and Fisheries,
Katherine.

CONTENTS

1. About This Publication

Observation, identification and nutrient analysis of plant species from Victoria River Research Station, Kidman Springs has been carried out since the 1960's. Dried specimens of the major species along with land system maps were distributed to all V.R.D. lesees during the early 1970's by Brian Hill and the staff of Kidman Springs. Some of these herbariums remain in use in the V.R.D.

This publication aims to collate some 25 years of observation and data collection to add to the references already available. Nutritional information that does not have an indicated reference source, is unpublished data from Kidman Springs.

The loose leaf **format** is designed to enable updating as more information becomes available.

Plant **collection** and **illustration** was done by Heather Vallance, who was Assistant Manager of Kidman Springs in 1990/91. She collected plants and prepared the illustrations. Her dedication is shown by the completion of the work after leaving the N.T. to continue study in scientific illustration.

Photographs were taken by Mike Cobiac, who is now working in the Rangeland Management team.

Much of the **nutritional information** provided came from the work of Brian Hill while Manager of Kidman Springs, and other staff over the years.

The nutritional and digestibility analyses were carried out by Doug Wilson, Dean Newman and staff of the Alice Springs nutrition laboratory and the staff of the chemistry laboratory in Darwin.

Clyde Dunlop and the staff of the N.T. herbarium, CCNT, provided much of the species identification.

Mike Lazarides of the Australian National Herbarium provided guidance in the use of scientific names.

Other contributors who spent many long hours to get this publication out in its present form were:

Jeremy Bright: Technician, 1990-91
Dave Epworth: Animal Production Officer, 1989-90
Rohan Sullivan: Manager, Kidman Springs, 1988 - today

2. About Victoria River Research Station

Location

Kidman Springs covers an area of approximately 350km^2. It is located 300km south-west of Katherine in the region's major beef production area - the Victoria River District. Kidman Springs provides the land and infrastructure to carry out animal production and rangeland management research for the beef industry of the region, the semi-arid tropics of the Northern Territory and northern Australia. It is one of the few such stations in the tropics world-wide.

About the station

The station presently carries about 1,300 head of cattle. The major herd is predominantly Droughtmaster (*i.e.* 5/8 *Bos indicus*). There is a smaller herd of about 100 predominantly Brahman breeders.

The station is an integral link in the Katherine Region's research and extension effort and is run by a manager and four staff.

The station was established from an existing stock reserve and was granted as a land claim in March 1993.

Kidman Springs was established in the early 60's, originally to carry out selection work with the "*Territory Shorthorn*". With the introduction of *Bos indicus* cattle, the beef depression of the 70's, the Brucellosis and Tuberculosis Eradication Campaign and changing markets, the directions of research changed to concentrate on aspects of herd management and animal nutrition. All of the work carried out at Kidman has the aim of improving the sustainability of beef production in the northern half of the Northern Territory.

During the 80's the major research effort aimed to develop management packages for the district, the emphasis being on weaning practices. Low reproductive rates and high mortality rates in breeders are recognised as the traditional constraints to productivity in the district and north Australia generally. The need to vaccinate against the disease, botulism, was also clearly demonstrated at the research station. Various alternative fence designs and other items of station infrastructure were also evaluated during this period.

Present research

Since 1990 the station has run the breeder herd under "*The Best Bet Management System*", a management package developed from a decade of research at Kidman and other sites in the region. To the practices of conservative stocking rates, weaning, vaccinating for the major diseases and using tropically adapted breeds, a supplementation program for breeders was added. The result over three years has been a substantial increase in herd productivity resulting in a large increase in turn off rates and thus profitability. We believe this to be an excellent model for production in the region.

Management of the pasture resource has always been an important component of the management packages being developed at Kidman Springs. Indeed Kidman is the only area in the northern pastoral zone of the N.T. where long term monitoring of the pasture resource has been undertaken. Current programs include studies of the use and role of fire in the pastoral zone, the effect of shrub densities on pasture production and the regeneration of scalded areas.

The station is now a major site for the North Australian Program 2, a research program funded by the Meat Research Corporation with the Northern Territory government. This

program aims to develop management packages for the sustainable management of pastures for beef production.

Kidman Springs also supplies cattle to other research stations and research projects elsewhere in the north, as well as stock for sentinel bleeding studies (to detect the entry of viruses into the NT from the north *e.g.* Bluetongue) both at Kidman Springs and other locations. Other organisations such as the Conservation Commission, the N.T University and the CSIRO also co-operate in the research effort on the station.

3. About the Victoria River District

Size

The Victoria River District contains 37 stations, occupying 116 930 km^2 of Pastoral lease land and running a total of approximately 320 000 head of cattle at the time of publication.

Climate and Vegetation

The District is defined as being predominantly semi-arid, lying between latitudes 15° and 19° S., longitudes 129° and 132° E., having a warm dry monsoonal climate characterised by a rainy season of 4-5 months and a dry period of virtual drought for the rest of the year.

Rainfall is highest in the north with an average of 890-1020mm (35-40"), declining rapidly to an average 390mm (15") and below in the southernmost areas. Although rainfall occurs mostly in summer, the southern area can receive winter rain from the south or west.

The length of the useful growing period for natural pastures ranges from about 9 weeks in the driest localities up to 5 months in the wetter areas. Although pasture growth in the north is vigorous and rapid, the nutritional value of pastures growing there (*e.g.* Kangaroo Grass (*Themeda triandra*) and *Sorghum* spp.) declines rapidly with maturity. Although rainfall declines with an increase in latitude, the nutritional value of the pastures generally improve.

For a comprehensive description of the Land Systems of the area, its climate, soils and vegetation, reference should be made to C.S.I.R.O. (1970) Land Research Series No. 28. or Conservation Commission land unit survey maps.

Land Systems and Vegetation

The land systems of the district vary from saline estuarine plains around the Joseph Bonaparte Gulf in the north to desert scrubland in the south.

In the higher rainfall area of the north, the country is rugged and hilly broken by valleys of tropical tall grass and bluegrass plains. Soils of the tall grass plains vary from leached sandy to leached loamy soils and carry the tussocky tall perennial grasses, Kangaroo grass (*Themeda triandra*), perennial sorghum (*Sorghum plumosum*), Golden Beard grass (*Chrysopogon fallax*), White grass (*Sehima nervosum*) and Black Spear grass (*Heteropogon contortus*). The upper story is mainly Eucalyptus box or bloodwood community, averaging 10-13m in height. The Blue grass plains of perennial *Dicanthium* spp and Golden Beard grass consist of flat to gently undulating country with cracking clay soils developed on basalt or alluvium. Upper story on these plains are scattered Rosewood and Nutwood (*Terminalia* spp).

In the central section, the hilly country persists with larger areas of less rugged and more undulating country than in the northern portion. Tall perennial grasses dominate the lower country of loamy soils with some areas of Mitchell grass (*Astrebla* spp) on the basalt soils. Smaller pockets of erodible calcareous soils carry arid short grass species mainly Limestone grass (*Enneapogon* spp), and Kerosene and Wire grasses (*Aristida* spp). The hilly country supports poor quality soft spinifex (*Plectrachne pungens*) and a low woodland of Snappy gum (*Eucalyptus brevifolia*).

The southern low rainfall area is mainly open undulating country or soft spinifex plains on sandy or gravelly soils. This is broken by plains of cracking clay soils carrying the more productive Mitchell grass species and constitutes some of the best grazing land of the area. (Robertson, 1983)

4. How to Use This Publication

The book is broken into four sections.

Pasture grasses
Herbs and Forbs
Browse Species
Index

The Species are arranged in alphabetical order on scientific names with misapplied or invalid names in brackets following the valid name. Valid names are according to Lazarides and Hince (1993) or Lazarides (pers. comm.).

The inclusion of an **index** on the green pages, at the back of the book allows easy access to most species. The **glossary** on yellow pages explains some of the terms used.

For any **further information**: useful texts, pamphlets and Agnotes have been listed in the references section on page 95. Each reference has a corresponding number which can be found in the plant description.

What the measurements mean

Plants are a better predictor of rangeland condition, than of stock condition. Stock condition is associated more with particular circumstances (*e.g.* poor seasons, time of year or the animals physiological state), rather than with the particular plant species being grazed. A low nutrient content in one plant grazed can be compensated for by higher levels of other plants in the diet.

The nutritional information has been displayed as wet season and dry season information. For the purpose of this publication, wet season refers to the months of December to March inclusive as well as any data entries described as fresh green growth. The dry season refers to the months April to November or any data entries that are described as dry feed. The nutritive value of a plant is greatest when it is green and actively growing and it declines rapidly after the plants reach maturity.

Crude Protein (CP) - *Protein* is the major nutrient limiting animal production during the dry season. *Crude protein* is an **estimate** of the *true protein* and is determined by multiplying the nitrogen content of the plant by 6.25. Native pasture species generally have *crude protein* levels between 7 - 12% during the growing season. This value drops to 1 - 4% during the dry season. If there is inadequate *protein* in the diet, animals will lose weight, even if feed is abundant

Phosphorus (P) - The *phosphorus* content of pasture depends very much on the *phosphorus* content of the soil. Soils in the VRD are typically low in *phosphorus* therefore making native pasture low in *phosphorus* for most of the year. *Phosphorus* limits animal production in the wet season when *crude protein* and *energy* are sufficient.

Digestibility - *Digestibility* is a measure that estimates a plant's ability to supply *energy*. Plant species will vary in *digestibility*, however the biggest difference will occur from the wet season to the dry season. As plants get older and dry out the *digestibility* decreases. *High digestibility* plants generally have values of 60 - 70%. *Low digestibility* plants can have values of 25 - 40%. This means that the plant will take a long time to digest, the animal can't eat as much because the rumen does not empty as quickly, overall nutrition declines and growth is either slowed or becomes negative.

Energy - *Energy* is the most important item in an animal's diet. *Energy* requirements of animals are affected by many different factors such as age, species, activity of the animal, level of production and temperature. The amount of *energy* available to the animal from a food source is affected by its *digestibility*. Even though *total (or gross) energy* is similar in all feedstuffs, the *digestibility* of the feed will vary the amount of *energy* that the animal can obtain. *Energy* requirements can be estimated from *digestibility* by using the following general formula.

Metabolisable Energy (ME MJ/kg) = 0.15 x Digestibility (DMD %)

(Source: S.C.A., 1990)

Daily Animal Requirements - for maintenance (to stay at the same weight)

	Dry Female (350kg)		Wet Female (350kg)		Steer (300kg)	
	intake per animal	intake per kg of DM	intake per animal	intake per kg of DM	intake per animal	intake kg of DM
Dry Matter	5.8 kg		8.6 kg		4.5 kg	
Crude Protein	340 gms	5.9%	790 gms	9.2%	350 gms	7.8%
Phosphorus	9 gms	0.16%	20 gms	0.23%	8 gms	0.17%
Metabolisable Energy (ME)	43.1 MJ	7.53 MJ	74.1 MJ	8.62 MJ	38.6 MJ	4.0 MJ

(Source: QDPI, 1982)

e.g. estimating energy from Dry Matter Digestibility

Metabolisable Energy (ME MJ/kg) = 0.15 x Digestibility (DMD %)

A 350kg **dry cow** requires 7.53 MJ of *energy*/kg of dry matter. If she is grazing dry Limestone grass pasture at the end of the dry season with *digestibility* of 46%;

ME = 0.15 x 46%
ME = 6.93 MJ/kg
Deficient, loses weight

Whereas, if the same cow was grazing green Limestone grass in the early wet season with Digestibility of 60%;

ME = 0.15 x 60%
ME = 9 MJ/kg
Sufficient, production

By using this formula you can see what production can be expected from the pastures at various times of the year.

NOTE: In this example, the animals daily requirement for *crude protein* of 5.9% is met in the wet season but not in the dry, hence the value of protein supplementation in the dry season.

The *phosphorus* requirement is not met at any time of the year hence the value of feeding P in the wet season.

Palatability - *Palatability* is a subjective rating. It depends on what is available to the animal. An "*unpalatable*" species in one situation may be a preferred species in another, if there is nothing better for the stock to graze. *Palatability* is the most important determinant of feed value no matter what the situation. If a plant has a good nutritive value (*i.e.* high *digestibility*, high *protein*, and high *phosphorus*) but is not eaten by stock, then its' feed value is **zero**.

Glossary of Terms Used

Alluvial - sandy or Silty soils deposited by rivers or floods.

Alternate - leaves, arranged singly at different heights on the stem and on opposite sides of the stem.

Annual - a plant that grows from seed and completes its life cycle within one year or season.

Apex - The tip or point, *e.g.* of a leaf or fruit.

Awn - a fine, hair-like protrusion from part of the grass spikelet.

Biennial - living for two years only.

Bipinnate - a pinnate leaf - twice pinnately divided, the first divisions themselves divided - producing a feather-like leaf form.

Bract - a specialized leaf or leaf like structure usually situated at the base of a flower.

Browse - tender shoots or twigs of shrubs and trees, as food for cattle.

Calcareous - soils containing limestone (*calcium carbonate*).

Decreasers - plants which tend to disappear from the pasture under heavy grazing. They are usually the more palatable species.

Digestibility - the proportion of plant material which can be digested by stock when grazed.

Digitate - branching from the same point.

Floral Axis - flowering stem.

Floret - the smallest unit of an inflorescence.

Forb - a flowering plant whose stem above ground does not become woody and persistent.

Glume - boat shaped bracts that form the base of a spikelet.

Habit - the general appearance or growth form of a plant.

Increasers - plants which increase under heavy grazing. They are usually the more unpalatable pasture species and therefore survive better than palatable species.

Inflorescence - flowerhead.

Invader - weed species that 'invade ' disturbed or overgrazed pasture. They are usually unpalatable, prickly or toxic.

Lateral - situated at or directed to the side.

Leaf Sheath - the lower portion of a grass leaf, which more or less encircles the grass stem.

Leaflet - one of a number of small 'leaves' that make up one whole leaf.

Lemma - the lower bract forming the base of a floret.

Ovoid - oval in a silhouette, but solid, as an egg.

Palatability - the degree of acceptability to the grazing animal.

Perennial - living for more than two years.

Petiole - stalk of a leaf.

Pinnate - arranged with the divisions of a feather (*i.e.* several leaflets on the main leaf stem).

Pioneer - plant which colonises bare areas.

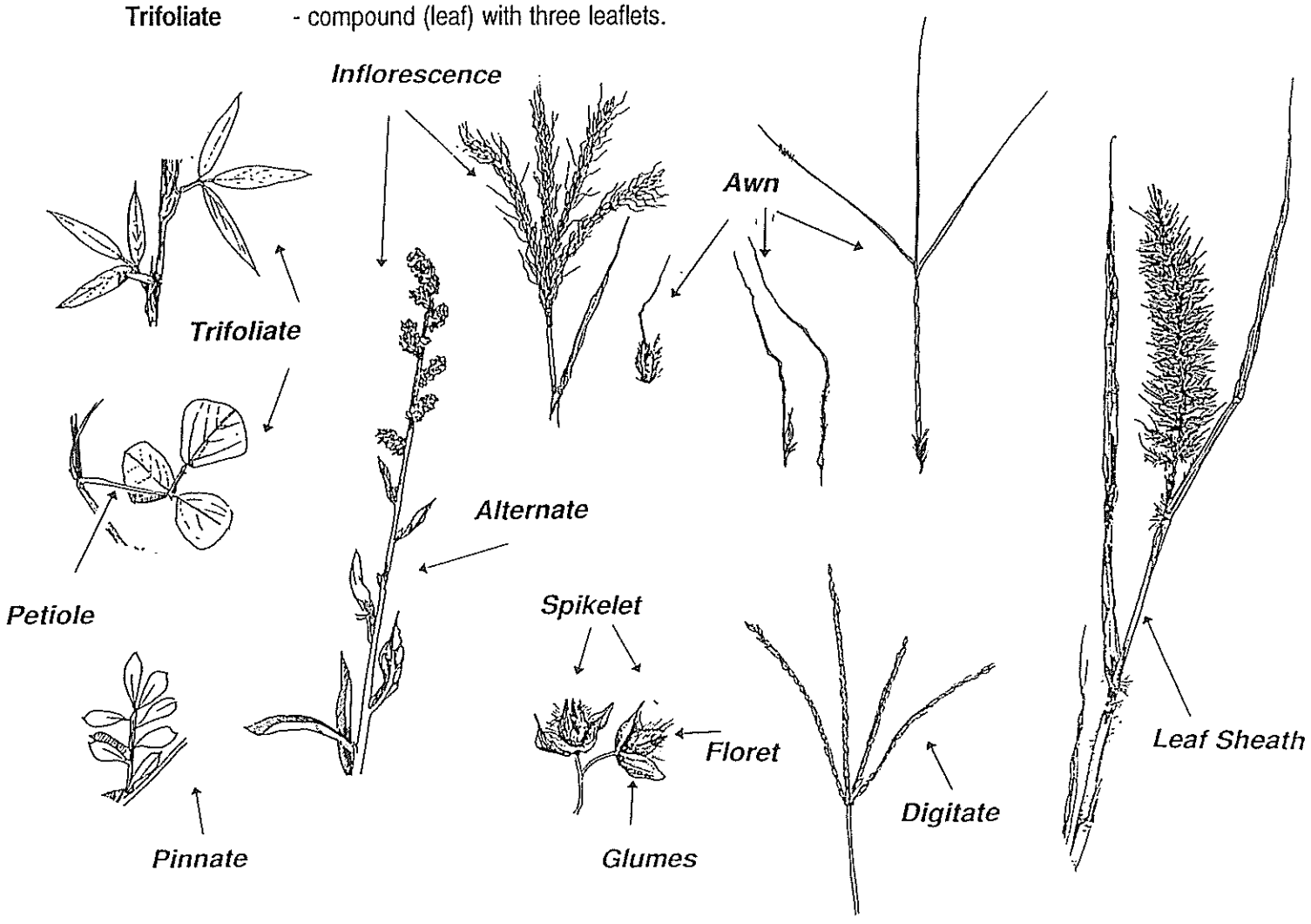
Prostrate - lying flat on the ground.

Rhizome - underground creeping stem, growing horizontally, and shooting at intervals.

Spikelet - the unit of a grass inflorescence, comprising two to many florets.

Terminal - end, or at tip of branch.

Trifoliate - compound (leaf) with three leaflets.



PART 1

Grass Species

Aristida contorta

Wiregrass

Kerosene Grass, White Spear Grass

Botanical name: *Aristida contorta* - Bunched Kerosene Grass
Aristida holathera (formerly *Aristida browniana*) - Erect Kerosene Grass

Description:
Erect or semi-erect annuals or short-lived perennials with wiry stems, generally not taller than 50cm. Leaf blades tightly rolled and curl upon drying. The Kerosene grasses are characterised by spear-like seeds with three spreading awns. The 3-awn generally has a twisted column above the sharp pointed seed.

A. contorta has reddish-purple floral parts on the upper half of the plant, whereas the inflorescence of *A. holathera* is straw coloured.

Habitats and Distribution:
Occur generally on red soil country but will grow over a range of types except for the heavy cracking clays. Bunched Kerosene Grass is an occupant of the lower rainfall districts of the VRD, gradually giving way to Erect Kerosene Grass in the north.

Grazing Value and Management:
Some grazing value when green but negligible after that, particularly if growing in sandy soil. The dry feed value is better if growing on higher quality soils. Increaser species, the Aristidas are indicators of declining rangeland condition if their densities increase on good pasture lands. They are a normal component of rocky slopes and shallow soils.

Nutritional Information:
Only of marginal value when green and declining rapidly after the rains cease. Standing dry feed will remain ungrazed late into the dry.

	Wet Season	Dry Season
Digestibility %	40.0	35.0
Crude Protein %	3.9	3.6
Phosphorus %	0.05	0.04

Further Information: 4, 20, 26, 32, 41

Aristida latifolia

Feathertop Wiregrass

White Spear Grass

Botanical name: *Aristida latifolia*

Colour Plate: Page 49

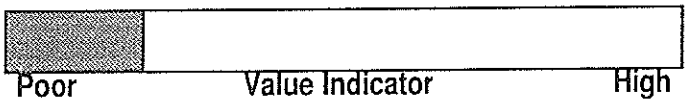
Description:
A tussocky perennial with slender, erect stems 60-80cm tall. Leaf sheaths are tight, covering most of the stem, and the long narrow leaf blades curl and twist into a tangled mass around the tussock as they dry. The seed head is long (45cm), narrow and branched with the characteristic three twisted awns on the seeds giving a feathery nature to the head, hence the name.

A similar species, *Aristida inaequiglumis*, occurs on red soil. It is distinguishable from *A. latifolia* by the untwisted awns on the seed.

Habitats and Distribution:
Commonly occurs with Mitchell grasses and Golden Beard Grass, on cracking clay black soil plains, to which it is generally confined.

Grazing Value and Management:
Not a particularly coarse grass, it is however generally ignored by grazing stock for more palatable species *e.g.* the Mitchell grasses (*Astrebla* spp.). During wetter than average years, it can increase and dominate a pasture, but has a low drought tolerance which checks its spread during below average seasons.

An important rangeland condition indicator, increasing densities of Feathertop Wiregrass (except in the wet years) suggests declining pasture quality. It is an increaser species.



Nutritional Information:
Neither nutritious nor digestible, Feathertop Wiregrass is significant to the pastoral industry as an indicator of the condition of black soil plains, rather than a source of fodder.

	Wet Season	Dry Season
Digestibility %	45.0	35.0
Crude Protein %	7.1	3.4
Phosphorus %	0.09	0.05

Further Information: 2, 4, 16, 20, 32

Astrebla elymoides

Weeping Mitchell Grass

Hoop Mitchell Grass, Slender Mitchell Grass

Botanical name: *Astrebla elymoides*

Colour Plate: Page 46

Description:
An erect tussocky perennial grass, up to 1.0m tall with a thick, hairless butt. Stems slender and often branched. Leaves 25cm long and quite narrow (3mm), curling and rolling as they dry. The long flowering stems are slender and droop toward the ground. Flower spikelets are very narrow and loosely overlap on the floral stalk.

Habitats and Distribution:
Found on black cracking clay soils and is often associated with other Mitchell grasses, bluegrasses (*Dichanthium* spp.) and Red Flinders Grass (*Iseilema vaginiflorum*). May be the dominant species in Mitchell grass communities.

Grazing Value and Management:
A hardy grower, it is especially palatable when young and actively growing. Produces new growth from most stem joints after rains. Considered of slightly lower grazing value than Barley Mitchell Grass (*A. pectinata*), it is a useful pasture species. Like the other *Astrebla* species, Weeping Mitchell Grass is a decreaser species under grazing.

Nutritional Information:
This species has moderate digestibility and nutritional value. While nutritive values decline as the dry season progresses, Mitchell grass retains a modest nutritional content and can provide a valuable source of dry season grazing.

	Wet Season	Dry Season
Digestibility %		56.0
Crude Protein %		3.9
Phosphorus %		0.06 n=1

Further Information: 20, 27, 32, 39

Astrebla pectinata

Barley Mitchell Grass

Botanical name: *Astrebla pectinata*

Colour Plate: Page 46

Description:
A compact, tussock forming perennial up to 1.0m tall. Erect branched stems arise from short rhizomes (underground stems). Long (20cm plus), flat, hairless leaf blades 6mm wide, have sharp edges and end in a tapering fine point. Leaves may curl with age. Small flowers closely overlapping on stalk which may not be completely emerged from the flag leaf.

Habitats and Distribution:
Inhabits black cracking clay river floodplains along major watercourses, and is often associated with other perennials, *e.g.* Curly Bluegrass (*Dichanthium fecundum*), Golden Beard Grass (*Chrysopogon fallax*) and other Mitchell Grass species.

Grazing Value and Management:
Of moderate palatability during the wet season, its high vegetative production enables quality grazing over an extended period. A useful fodder source until it matures when both nutritional value and palatability decline. While Barley Mitchell Grass is very tolerant of drought and heavy grazing, it is still a decreaser species under grazing.

Nutritional Information:
Nutritive value is good during the growing period, but this declines rapidly during the early dry as the plant stores nutrients in its perennial base for use next wet. Stock will have a good protein intake on Mitchell grass pastures due to their relatively high crude protein content and palatability.

	Wet Season	Dry Season
Digestibility %	51.0	41.0
Crude Protein %	9.1	4.0
Phosphorus %	0.15 n=2	0.06

Further Information: 20, 27, 32, 39, 41

Astrebla squarrosa

Bull Mitchell Grass

Botanical name: *Astrebla squarrosa*

Description:
A leafy, dense perennial with short rhizomes and erect, coarse stems up to 1.5m tall. Leaves long (to 40cm and 5mm wide) and finely pointed, with approximately 10 bristly, overlapping flower spikelets.

Habitats and Distribution:
Found on lighter/grey types of cracking clay soils, including floodouts and grey clays of the Sturt Plateau. Does not generally dominate a pasture, but occurs as a minor element of Mitchell Grass communities.

Grazing Value and Management:
Palatability is generally not as high as the other Mitchell Grass species which gives it some resistance to grazing, however it is a decreaser species, particularly in northern pasture systems.

Nutritional Information:
Limited data suggests nutritional value of Bull Mitchell Grass is slightly inferior to the other Mitchell grasses.

Ref. (Wet Season): D.Wilson, pers. comm.	Wet Season	Dry Season
Digestibility %	50.0	39.0
Crude Protein %	10.0	4.5
Phosphorus %	0.15	0.09 n=3

Further Information: 20, 27, 32

Bracharia miliiformis

Bracharia pubigera

Summer Grasses

Armgrasses

Botanical name: *Brachiaria miliiformis* - Armgrass Millet, Green Summer Grass
Brachiaria subquadripara (formerly *B.piligera*) - Hairy Armgrass
Brachiaria pubigera - Armgrass

Colour Plate: Page 50

Description:
Low to semi-erect annuals which root at the lower nodes. Leaf sheaths are loose with leaf blades being 5-10mm wide and up to 10cm long with thickened edges. Seed heads usually consist of alternate, sparse floral branchlets along a central axis.

Habitats and Distribution:
Preferring sandy soils, they are commonly found in heavily used and more fertile areas, cultivated lands, and where competition from perennial grasses has been reduced.

Grazing Value and Management:
Of moderate palatability and producing only modest bulk, Armgrasses are readily eaten by stock. However, its annual nature restricts its usefulness as a pasture to the growing season and they have little standing feed value. An increaser species.

Nutritional Information:

Ref (Wet Season): 28 (Dry): D.Wilson, pers comm	Wet Season	Dry Season
Digestibility %	57.0	40.0
Crude Protein %	12.5	1.9
Phosphorus %	0.21	0.08

Further Information: 4, 20, 32

Brachyachne convergens

Native Couch

False Couch, Kimberley Couch, Spider Grass

Botanical name: *Brachyachne convergens*

Colour Plate: Page 51

Description:
A weakly rooted, tufted annual with sprawling or upright stems to 30cm tall. Leaf sheaths often tinged with purple and overlap on stem. Leaf blades are short (5-7cm), flat and standing erect. Seed head is a terminal cluster of 3-5 floral branchlets, with two overlapping rows of flower spikelets on the underside. Often purplish when young, spikelets turn a pale straw colour as the plant matures.

It is similar in appearance to perennial lawn couch.

Habitats and Distribution:
Most common on heavy loam and clay soils, Native Couch will be found on other soil types if moisture is abundant. Along with Flinders grasses (*Iseilema* spp.) it will form the major component of annual grass pastures, and to a lesser extent, part of perennial Mitchell grass communities. Is commonly associated with Weeping Mitchell Grass (*Astrebla elymoides*).

Grazing Value and Management:
A useful pasture species with moderate palatability. Its production and proliferation are very seasonally dependant, increasing with rainfall. When in abundance, it is an important pasture component. Rapidly produces new green growth after first rains, providing early feed.

Caution: Native Couch produces a toxin (hydrocyanic, or prussic acid) which has been known to cause livestock mortalities. It is only toxic in the initial growth stage and not a problem unless very high amounts are consumed. Poisoning in horses has been suspected in recent years. It is unlikely to be a problem at all in mixed pastures.

While nutritious, an increasing incidence may indicate declining rangeland condition: the drought and grazing tolerance of rangelands decline as the annual content of a pasture increases.

Nutritional Information:
The nutritive value of this species is relatively high for a native grass, enhanced by its digestibility. Not as nutritious as the Flinders grasses, but remains a moderately useful feed after drying off.

	Wet Season	Dry Season
Digestibility %	62.0	47.0
Crude Protein %	11.9	5.1
Phosphorus %	0.13	0.08

Further Information: 2, 4, 10, 17, 20, 32

Cenchrus ciliaris

Gayndah Buffel Grass

Botanical name: *Cenchrus ciliaris* cv Gayndah

Colour Plate: Page 48

Description:
A perennial grass with thin, jointed stems arising from a dense knotty tussock. Forms a deep root system. Varying plant habit from short and stout (0.5m) to tall (1.5m). Dull green leaves are long and thin (25cm by 4-8mm). The 7cm long seed head has fluffy appearance due to long hairs arising from the flower spikelet base. Seeds are enclosed in a cluster of pale bristles, straw coloured to reddish tinge.

Habitats and Distribution:
Widely introduced as a pasture grass from Africa and Asia and now naturalised, it grows on alkaline (calcareous) soils of coarse texture, or sandy-loamy soils in all rainfall zones of the VRD. May expand into lighter clays in drier areas. Not recognised as being tolerant of waterlogging, however has performed well in the CCNT ponding for soil reclamation trials in the VRD.

Grazing Value and Management:
Gayndah Buffel is a palatable and digestible grass with a high dry matter production. Once established, it can withstand relatively heavy persistent grazing, and its tolerance of fire means it will re-shoot after burning. As well it responds rapidly to rain. Some evidence exists of possible oxalate toxicity problems if horses graze pure green stands, but this is unknown (and not expected) on N.T. pastures. Requires phosphorus application for establishment and maintenance.

Nutritional Information:
Not the most nutritious of the available improved pastures, but it is superior to many native grasses.

	Wet Season	Dry Season
Digestibility %	58.0	45.0
Crude Protein %	9.6	5.5
Phosphorus %	0.14	0.07

Other Cultivars of Use:

West Australian - short, erect habit, green in colour with intensely purple seed colour.

USA - medium height and semi prostrate habit, green in colour with reddish purple seed colour.

Biloela - tall, erect habit, bluish green in colour with straw coloured seeds. Favours heavy soil and is tolerant of waterlogging.

Further Information: 4, 5, 10, 20, 30, 32, 37

Cenchrus setiger

Birdwood Grass

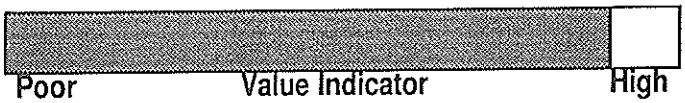
Botanical name: *Cenchrus setiger*

Colour Plate: Page 48

Description:
A slender tussocky perennial (often finely hairy) with a short rhizome. Stems erect or upright to approximately 1.0m. Loose, ridged leaf sheaths and long (to 30cm), narrow (4-8mm) leaves usually flat or folded. Flower spike cylindrical, dense and purple upon maturity. Floral axis zig-zagged, and seeds are in cup shaped burr clusters.

Habitats and Distribution:
Introduced species from Africa and India and is now considered naturalised, it is related to Buffel Grass (*C. ciliaris*). It prefers well drained, light textured and sandy soil types, but will grow over a wide range of soils. Birdwood Grass establishes well on low rainfall grazing land. It is common on sandy levee soils of the southern V.R.D.

Grazing Value and Management:
Responds quickly to light rains, providing early green shoots. Palatable and persistent, it is a valuable improved pasture in lower rainfall districts.



Nutritional Information:
Nutritional content is high while the plant is green and growing, but this declines markedly during the dry season.

	Wet Season	Dry Season
Digestibility %	57.0	51.0
Crude Protein %	10.7	7.3
Phosphorus %	0.14	0.09

Further Information: 4, 20, 32

Chloris barbata

Chloris lobata

Wild Rhodes Grass

Purpletop Rhodes Grass

Botanical name: *Chloris barbata* (*Chloris inflata*)

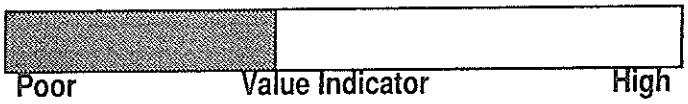
Colour Plate: Page 49

Description:
A sturdy perennial up to 1.0m tall. with spreading stems which often root from the lower nodes. Flat leaf blades, 10-20cm long and 5mm wide, tapering to a fine point. Seed head is a cluster of floral spikes, terminal on the flowering stem (similar to Native Couch (*Brachyachne convergens*) but spikes longer and more numerous on Chloris). Seed head is purplish with a finely hairy appearance.

Habitats and Distribution:
Introduced, Purpletop Chloris commonly grows on lands that have been disturbed *e.g.* cultivated land and roadsides.

Another species, *C. lobata* also occurs in the VRD but is of no pastoral significance.

Grazing Value and Management:
Moderate grazing value when green, but as a tall mature plant, it is seldom eaten by stock.



Nutritional Information:
Little available.

Reference: 28	Wet Season	Dry Season
Digestibility %	50.0	
Crude Protein %	8.6	
Phosphorus %	0.31	

Further Information: 4, 21, 32

Golden Beard Grass

Ribbon Grass, Weeping Grass

Botanical name: *Chrysopogon fallax*

Colour Plate: Page 47

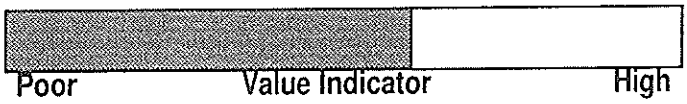
Description:
A deep-rooted, long living perennial, tussock grass, to 1.5m. Butt densely covered with soft hairs. Named for the way resembles an old mans' beard. Turns a distinctive gold colour during the dry. Heavily grazed tussocks appear like tufts of hair with the occasional bright green shoot appearing. Even, open seed head on a long stem with well developed grainy spears.

Habitats and Distribution:
Wide range of habitats from creek flats to laterite ridges. Commonly found on the margins of Mitchell grass areas, in association with the blue grasses (*Dichanthium* spp. and *Bothriochloa* spp.) and Silky Browntop (*Eulalia aurea*) on grey clays, and with White Oat grass (*Sehima nervosum*) on the red loams.

More common in the mid to north areas of the VRD and the Sturt Plateau in the rainfall zone of 400 - 1000 mm.

Grazing Value and Management:
Prolific root system gives this species good grazing and drought tolerance. Is commonly the last desirable perennial to disappear in heavily grazed areas but it does decrease with heavy grazing.

Responds to a rest from grazing particularly early in the wet season. Palatability varies between locations but is reasonably palatable in the early wet especially following a burn.



Nutritional Information:
Similar to other tussock perennials. Declines in quality especially from flowering on. Nutrients are moved back into root system at the end of the wet.

	Wet Season	Dry Season
Digestibility %	48.0	44.0
Crude Protein %	8.4	4.3
Phosphorus %	0.12	0.06

Further Information: 2, 4, 15, 20, 24, 32

Cymbopogon bombycinus

Cymbopogon procerus

Lemon Grass

Botanical name: *Cymbopogon bombycinus* - Silky Oilgrass/Citronella Grass
Cymbopogon procerus - Scentgrass/Lemon Grass

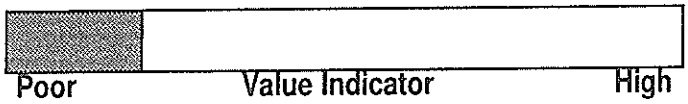
Description:
Strongly aromatic perennials, the leaves having a strong citrus scent when crushed.

Silky oilgrass grows to 1.0m tall. Leaf sheaths taper toward their apex; leaf blades flat or folded. Old basal leaves and sheaths coil and tangle around the plant. Reddish leafy seedhead with many white silky hairs.

Lemon Grass produces sturdy erect stems 2-3m tall. Blue-green leaf blades are broad, flat and distinctly lined.

Habitats and Distribution:
Silky Oilgrass generally grows in the richer soil areas of Soft Spinifex lands.
Lemon Grass prefers rocky slopes and other shallow, well drained areas.

Grazing Value and Management:
Palatability is moderate when green, but soon becomes coarse and poor quality feed as the season dries off. The Lemon Grasses are increaser species. They are not significant species.



Nutritional Information:
Nutritive value is restricted to the early growth stages.

Reference: 28	Wet Season	Dry Season
Digestibility %		
Crude Protein %	1.9	
Phosphorus %	0.02	

Further Information: 20, 32

Dactyloctenium aegyptium

Dactyloctenium radulans

Button Grass

Botanical name: *Dactyloctenium aegyptium* - Coast Button Grass
Dactyloctenium radulans - Button Grass

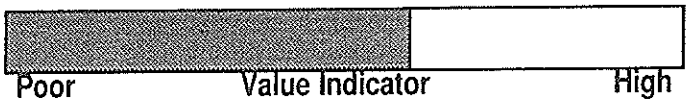
Colour Plate: Page 50

Description:
A prostrate, tufted annual with slender stems weakly ascending to 25cm high. The smooth leaf sheath is loose and the flat leaf blades have long fine hairs and a slightly undulating margin. The seed head of Button Grass consists of numerous short (2-8mm) finger-like spikes each ending in a point, clustered in a star shaped arrangement. One species has much longer spikes.

Habitats and Distribution:
D. aegyptium is an introduced species.

Button grasses occur in flat to undulating country on calcareous or alluvial soils of a medium to fine texture (loamy to clay), though less on the heavy clays. Common on roadsides, around yards, and along stock routes, where grazing has been heavy and fertility is higher than normal.

Grazing Value and Management:
Considered excellent grazing but producing little bulk, its value is restricted to the period of growth.



Nutritional Information:

Ref. Dry: D.Wilson, pers. comm.	Wet Season	Dry Season
Digestibility %	55.0	39.0
Crude Protein %	15.4	3.1
Phosphorus %	0.35	0.04

Further Information: 4, 20, 32, 41

Dichanthium fecundum

Dichanthium sericeum

Bluegrass

Botanical name: *Dichanthium fecundum* - Curly Bluegrass
Dichanthium sericeum ssp *sericeum* - Queensland Bluegrass
Dichanthium annulatum - Annual Bluegrass

Colour Plate: Page 47

Description:
Tufted perennials to 1.0m high.

Curly Bluegrass has slender branched stems, faintly lined leaf sheaths, and long narrow leaf blades. Flowers are small on closely spaced floral stems along a central axis.

Queensland Bluegrass is a sturdier stemmed plant with wider, rough leaves. Inflorescence consists of approximately 7 silky haired floral stalks clustered together at the end of a flowering stem.

Habitats and Distribution:
Most common on black soils and grey clays, however Curly Bluegrass will be found on lighter textured soil types. Grows in deep soils in high rainfall areas.

Grazing Value and Management:
Very palatable and high yielding, the Bluegrasses are considered excellent grazing species, and are as such, decreaser species if overgrazed.

Nutritional Information:
Value is highest after early rains. Queensland Bluegrass in particular is a very nutritious native pasture grass, however like so many of the perennial grasses, it makes poor standing dry feed as the plant stores mobile nutrients in its butt.

	Wet Season	Dry Season
Digestibility %	50.0	42.0
Crude Protein %	7.4	4.2
Phosphorus %	0.13	0.07

Annual Bluegrass

	Wet Season	Dry Season
Digestibility %	56.0	45.0
Crude Protein %	7.0	5.7
Phosphorus %	0.14	0.08

Further Information: 2, 32

Digitaria bicornis

Digitaria ciliaris

Digit Grass

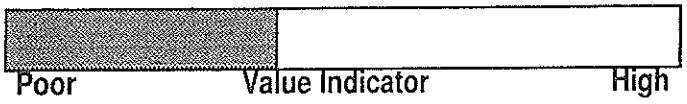
Botanical name: *Digitaria bicornis* - Finger Grass, Hairy Finger Grass
Digitaria ciliaris - Summer Grass

Colour Plate: Page 51

Description:
Annual, tufted species from 0.2-1.0m high. Leaf blades are flat and 2-10mm wide. The leaf blades of Summer grass may be hairy on the lower surface. These two species closely resemble each other and can be confused at different times. The main flowering period is from April to June, but Finger grass can flower from February to July.

Habitats and Distribution:
Widespread on sandy or clay soils often as a coloniser of bare soils. Summer grass is often found on alluvial soils.

Grazing Value and Management:
Being annuals the nutritional value declines rapidly in the dry season. They are usually low in dry matter and of little grazing value.



Nutritional Information:

Ref.: D.Wilson, pers. comm.	Wet Season	Dry Season
Digestibility %	71.0	32.0
Crude Protein %	13.8	2.2
Phosphorus %	0.35	0.02

Further Information: 4, 32, 48

Echinochloa colona

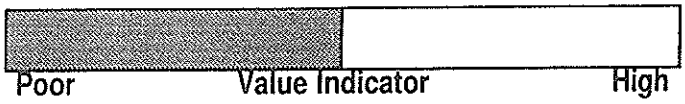
Awnless Barnyard Grass

Botanical name: *Echinochloa colona*

Description:
A prostrate annual forming a clump and producing semi-erect stems to 60cm tall, which may root at the lower nodes. Flat leaf blades 3-8mm wide and up to 15cm long. Seed heads are a series of spreading floral branchlets with a purplish appearance along a central axis, to give an overall pyramid shape. Floral spikelets are usually arranged in four irregular rows on the branchlet.

Habitats and Distribution:
Introduced and now a naturalised species, Awnless Barnyard Grass is an inhabitant of creek banks, waterholes, gilgais and cracking clay soils.

Grazing Value and Management:
Palatable to stock, it is heavily grazed when green.



Nutritional Information:
Little available.

Reference: 28	Wet Season	Dry Season
Digestibility %	43.0	
Crude Protein %	7.4	
Phosphorus %	0.13	

Further Information: 4, 20, 21, 32

Enneapogon purpurascens

Enneapogon polyphyllus

Limestone Grass

Nineawn

Botanical name: *Enneapogon polyphyllus*
Enneapogon purpurascens (*Enneapogon glaber*)

Colour Plate: Page 51

Description:
Tufted annuals or short-lived perennials to 0.4m tall. Often have gland-tipped hairs on foliage. Leaf blades narrow (2-3mm) and to 15cm long. Inflorescence is narrow floral spikelets from a central axis, often tinged with purple,and terminal on the flowering stem.

All Enneapogon species have nine awns on the lemma (small floral leaf around flower) from which they derive their minor common name.

Habitats and Distribution:
As their common name suggests, Enneapogon species are found on soils of limestone origin (calcareous), in dry to medium rainfall districts. Occur on very shallow rocky soils in higher rainfall localities. *E. polyphyllus* is often associated with Golden Beard Grass (*Chrysopogon fallax*) and Soft Spinifex (*Plectrachne pungens*).

Grazing Value and Management:
Useful pasture grasses freely grazed by cattle. If dominant, they can provide high quality feed for a short period. Shoot readily after any measurable rains. A productive species, but must be stocked lightly. It will disappear with heavy grazing. Limestone grass pastures are often the first to show signs of overgrazing.

Nutritional Information:
Particularly nutritious during early growth, livestock may achieve significant liveweight gains if grazing Limestone Grass pastures at low stocking rates.

	Wet Season	Dry Season
Digestibility %	60.0	46.0
Crude Protein %	10.4	5.7
Phosphorus %	0.12	0.08

Further Information: 20, 32, 41

Eragrostis basedowii

Eragrostis tenellula

Lovegrass

Botanical name: *Eragrostis basedowii* - Clustered Lovegrass
Eragrostis tenellula - Delicate Lovegrass

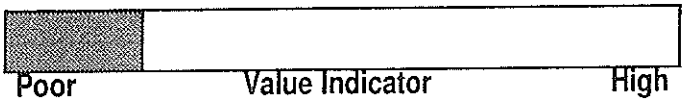
Description:
Many species of Lovegrasses occur in the VRD, with varying habits and location. All Eragrostis species have a similar inflorescence:- the spikelets are flattened in two overlapping rows.

Clustered Lovegrass is a slender annual or short lived perennial with a leafy base and spreading semi-erect stems which rarely exceed 25cm in height. Purplish leaf sheaths enclose fine, flat leaf blades up to 15cm long. The narrow seed head has small floral spikelets on short stalks, or from the central stem itself near the tip.

Delicate Lovegrass is a tufted perennial 50-80cm high with coarse stems. Leaf sheaths and long leaf blades are distinctly lined. Inflorescence is open, delicate (hence common name), and many branched, often being over half the height of the plant. The floral spikelets are fine and very small. Drooping flowering stems give the plant a weeping appearance.

Habitats and Distribution:
E. basedowii is a widespread species on sandy to loamy soils in medium to high rainfall zones, while *E. tenellula* prefers heavier soil types around wet areas.

Grazing Value and Management:
While some lovegrasses are grazed, the characteristics of poor palatability particularly when dry, and low bulk production give the Lovegrasses a minimal grazing value. They may be increaser species.



Nutritional Information:

	Wet Season	Dry Season
Digestibility %	42.0	41.0
Crude Protein %	4.5	4.3
Phosphorus %	0.07 n=1	0.08 n=4

Further Information: 2, 4, 20, 32

(x 2)

Eriachne glauca

(x 10)

(x 1·5)

Eriachne ciliata

Kerosene Grass
Wiregrass

Botanical name: *Eriachne* spp.

Colour Plate: Page 51

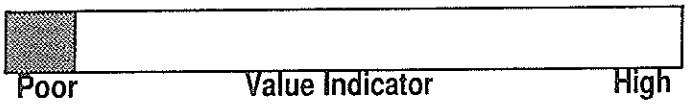
Description:
Mostly perennial, the Wiregrasses vary in height from 40-80cm tall and often with a purplish tinge to the erect stems. Leaf blades are rough, particularly the edges. The inflorescence form varies within the genus and some are illustrated here.

Habitats and Distribution:
E. ciliata (Slender Wiregrass) is widespread in drier regions, preferring red sandy soils.

E. obtusa (Northern Wiregrass) occurs in dry regions often with Golden Beard Grass (*Chrysopogon fallax*), and Soft spinifex (*Plectrachne pungens*).

E. festucacea and *E. glauca* both prefer wetter locations on heavy soil types in higher rainfall districts.

Grazing Value and Management:
Fairly unpalatable, the Wiregrasses may provide some green pick early in the season, but are generally ignored by stock. In areas of heavy grazing utilisation, they may behave as increaser species.



Nutritional Information:
Low value sources of nutrition.

	Wet Season	Dry Season
Digestibility %	33.0	
Crude Protein %	4.5	
Phosphorus %	0.06 n=1	

Further Information: 4, 20, 32

Eulalia aurea

Silky Browntop

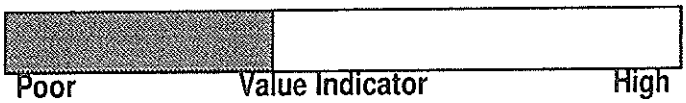
Botanical name: *Eulalia aurea* (formerly *E. fulva*)

Colour Plate: Page 47

Description:
A long-lived, tussock forming, rhizomatous perennial up to 1.5m high, often with short hairs on its base. Flat leaf blades gradually tapering to a fine point. Foliage appears a distinctive red-brown during the dry. Seed heads are on erect stems and are clusters of floral bearing stalks of differing lengths. Flower spikelets with a brown awn and contain brown silky hairs, giving the common name.

Habitats and Distribution:
Favours deep soils in wetter areas *e.g.* along watercourse banks, and black soil depressions in districts receiving a moderate amount of rainfall. Found commonly on grey clay soils in the Northern V.R.D. and Sturt Plateau, growing in association with Golden Beard Grass and Bluegrasses.

Grazing Value and Management:
Drought resistant, it is of moderate palatability when green and quite unpalatable and low in nutritional value when dry. Cattle will graze the short green pick early in the wet season, particularly following a burn.



Nutritional Information:
Little available.

Reference: 28	Wet Season	Dry Season
Digestibility %	36.0	
Crude Protein %	4.4	
Phosphorus %	0.08	

Further Information: 20, 26, 32

Heteropogon contortus

Black Speargrass

Bunch Speargrass

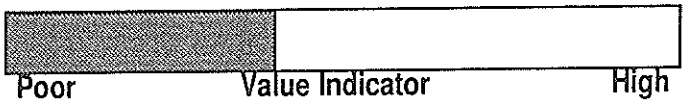
Botanical name: *Heteropogon contortus*

Colour Plate: Page 49

Description:
A perennial tufted grass with stems up to 1.0m tall. Leaf sheaths smooth and longitudinally ridged; leaf blades flat or folded. Seed head is a single stalk along which floral spikelets are arranged. The 10cm long, dark brown awns on upper spikelets curl and bunch together as they mature. Dry foliage has an obvious reddish tint.

Habitats and Distribution:
Occurring on various soil types, particularly red lateritic sands and brown sand-loam soils. Often associated with Curly Bluegrass (*Dichanthium fecundum*) and Golden Beard Grass (*Chrysopogon fallax*). It is an invasive species under certain conditions. It is a prolific seeder and has the ability to colonise bare ground.

Grazing Value and Management:
Vigorous and moderately palatable when young, it can be a source of useful fodder early in the season, but this declines rapidly at the end of the wet season. Not at all palatable or nutritious when mature, Black Speargrass will appear almost ungrazed late into the dry. Fire should be used to remove old standing dry matter.



Nutritional Information:
Only moderate during the growing season, it becomes a very poor nutritional source during the dry.

	Wet Season	Dry Season
Digestibility %	48.0	35.0
Crude Protein %	7.2	3.0
Phosphorus %	0.11	0.04

Further Information: 2, 4, 20, 32

Iseilema vaginiflorum

Iseilema fragile

Flinders Grass

Botanical name: *Iseilema fragile* - Bull Flinders Grass
I. macratherum - Flinders Grass
I. vaginiflorum - Red Flinders Grass
I. ciliatum - Big Seeded Flinders Grass

Colour Plate: Page 50

Description:
Several species occur in the VRD. All are similar in appearance. Flinders grasses are erect (though taller plants tend to lodge), leafy, tufted annuals with a general red to purple appearance when dry. Leaf sheaths are smooth and ridged lengthwise, and leaf blades are long (to 20cm), flat, 5mm wide and smooth. Seed heads leafy and partly enclosed by the main flag leaf.

I. macratherum has a distinct scent when green.

I. vaginiflorum is the most purple-tinged species.

Habitats and Distribution:
Widely distributed, Flinders grasses commonly grow on the heavy cracking clays of the black soil plains, and on medium textured red earths. Often associated with the Mitchell grasses (*Astrebla* spp.) and bluegrasses (*Dichanthium* spp.).

Grazing Value and Management:
Production is very seasonal. May dominate a pasture one year and form only a minor component the next. Above average years will favour an increase in Flinders grass densities. A slow responder to the first rains (up to a month), they do not provide the very early green pick. A valuable pasture grass during the growing season, however it dries off rapidly as the season ends and is of very little residual feed value as the dry season progresses. May behave as an increaser, as heavy grazing will reduce competition from perennials, but this may not benefit pasture (low dry season grazing).

Nutritional Information:
Higher in crude protein, phosphorus, and digestibility than perennials during the early growing season, Flinders grasses are important pasture components although only for a short time of the year.

	Wet Season	Dry Season
Digestibility %	48.0	40.0
Crude Protein %	6.6	3.2
Phosphorus %	0.11	0.10

Further Information: 4, 14, 20, 32

Mnesithea formosa

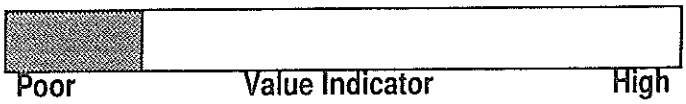
Rottboelia

Botanical name: *Mnesithea formosa* (*Rottboelia formosa*)

Description:
A slender annual up to 0.4m high. Leaf blades are flat and narrow up to 12cm long and 1-3mm wide.

Habitats and Distribution:
It is only a minor species in pastures on sandy or light soils in medium and high rainfall areas.

Grazing Value and Management:
Rottboelia is a moderately palatable species, but produces low bulk. Its lack of resistance to grazing pressure reduces its pastoral significance. It is not common enough to be an important pasture component.



Nutritional Information:
None available.

Further Information: 20, 32, 48

Ophiuros exaltatus

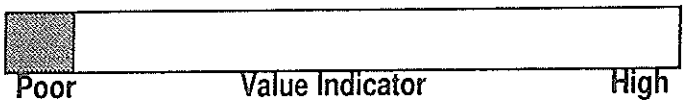
Canegrass

Botanical name: *Ophiuros exaltatus*

Description:
An erect, sturdy stemmed plant to 2.5m tall. Stems are hairless and often branching. Broad (2cm) and long (to 40cm) leaf blades have rough edges. Floral spikelets are along digitate stalks grouped on a tall flowering stem.

Habitats and Distribution:
An inhabitant of wet areas it will commonly be found in low areas of black soil and along watercourse banks. It is more common in the Northern V.R.D.

Grazing Value and Management:
An unpalatable species, it is generally not grazed by stock.



Nutritional Information:

Ref.: D.Wilson, pers.comm.	Wet Season	Dry Season
Digestibility %	54.0	33.0
Crude Protein %	6.2	1.9
Phosphorus %	0.11	0.02

Further Information: 32

Panicum decompositum

Native Millet

Botanical name: *Panicum decompositum*

Colour Plate: Page 46

Description:
An erect, coarse, tussock forming perennial 50cm, sometimes to 1.0m tall. Numerous soft, hollow stems with broad, papery basal leaves appearing shiny and whitish. Stems mostly covered by leaf sheaths. Leaf blades often over 10mm. wide with rough edges, a tapering point and standing erect. The flowering head is as wide as is long, branched and very open. The few small flowers occur in pairs on long branchlets.

Habitats and Distribution:
Widespread but often dominant, Native Millet occurs on clay soils and floodplains, often associated with the Mitchell grasses (*Astrebla* spp.), Golden Beard Grass (*Chrysopogon fallax*), and the Bluegrasses (*Dichanthium* spp.).

Grazing Value and Management:
Palatability seems to vary with soil type, but it is generally considered a good source of fodder. A decreaser species, it may be rapidly grazed out, particularly on the lighter soils of its habitat.

Nutritional Information:

	Wet Season	Dry Season
Digestibility %	47.0	40.0
Crude Protein %	6.9	3.2
Phosphorus %	0.12 n=3	0.06 n=5

Further Information: 2, 20, 32

Paspalidium rarum

Rare Paspalidium

Botanical name: *Paspalidium rarum*

Description:
A slender, tufted annual or short lived perennial 20-30cm tall. Stems gradually ascend and may root at lower nodes. Leaves are soft, lined and hairless to 10cm long. The single seed head is elongated, narrow and spike-like with a small bristle at the base of each flower.

Habitats and Distribution:
Preferring alluvial and good pasture lands, it does grow over a wide range from spinifex lands to black soil plains.

Grazing Value and Management:
A very palatable species, it is selectively grazed by stock and thus is prone to being quickly eaten out. A useful plant in native pasture communities.

Nutritional Information:
None available.

Further Information: 20, 32

Perotis rara

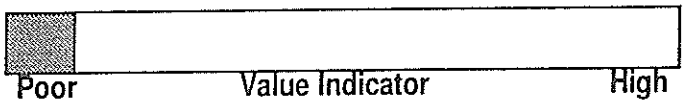
Comet Grass

Botanical name: *Perotis rara*

Description:
A slender annual or short lived perennial to 30cm tall. The leaf sheath is short, loose and bearded at the opening; the leaf blade being short (4cm) and smooth. Seed head is a long stalk with the floral spikelets occurring singly with a long awn (3-5cm), and point abruptly downwards along the stem.

Habitats and Distribution:
Most commonly found on sandy soil types, particularly in the Northern V.R.D.

Grazing Value and Management:
Of little value as a grazing species.



Nutritional Information:
None available.

Further Information: 20, 32

Pletrachne pungens

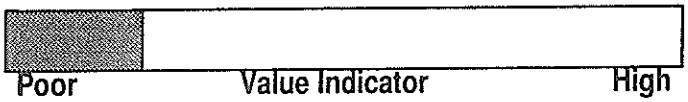
Soft Spinifex

Botanical name: *Plectrachne pungens*

Description:
A tussock forming perennial up to 1.2m tall. Foliage is slender and rolled and somewhat sticky to touch. Leaf sheaths are often bearded at their opening, with the leaf blades up to 25cm long and curling with age. Has an open, feathery seed head and the floral spikelets are awned (12-16mm).

Habitats and Distribution:
Tends to grow on ridges and slopes, and low producing soils. An occupant of the low rainfall areas of the V.R.D. Sometimes associated with Golden Beard Grass (*Chrysopogon fallax*).

Grazing Value and Management:
Drought resistant but relatively unpalatable, it is not often utilised by grazing livestock except in times of pasture shortage, when it may be a useful reserve. It is unlikely to be eaten unless it has fresh short shoots or has been burnt, and cattle are supplemented. Is said to be highly inflammable.



Nutritional Information:
Low in nutritional value.

	Wet Season	Dry Season
Digestibility %		32.0
Crude Protein %	9.1	4.8
Phosphorus %	0.13 n=5	0.05 n=4

Further Information: 20, 32

Sehima nervosum

Whitegrass

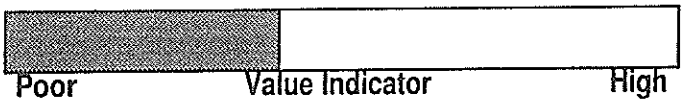
White Oat Grass

Botanical name: *Sehima nervosum*

Description:
An erect tufted perennial with slender stems to 1.0m tall. Smooth leaf sheaths and long (30cm) tapering blades covered with a blue-green coating which rubs off. Foliage dries to a whitish colour. Flowering head is a solitary long narrow spike with awned florets.

Habitats and Distribution:
Widespread but rarely dominant, it occurs as a component of perennial grass communities along with Golden Beard Grass (*Chrysopogon fallax*), Kangaroo Grass (*Themeda triandra*), and Curly Bluegrass (*Dichanthium fecundum*). Mostly found on red soil areas of the Northern and Central V.R.D. and Sturt Plateau, as well as on some semi-desert areas in the Southern V.R.D.

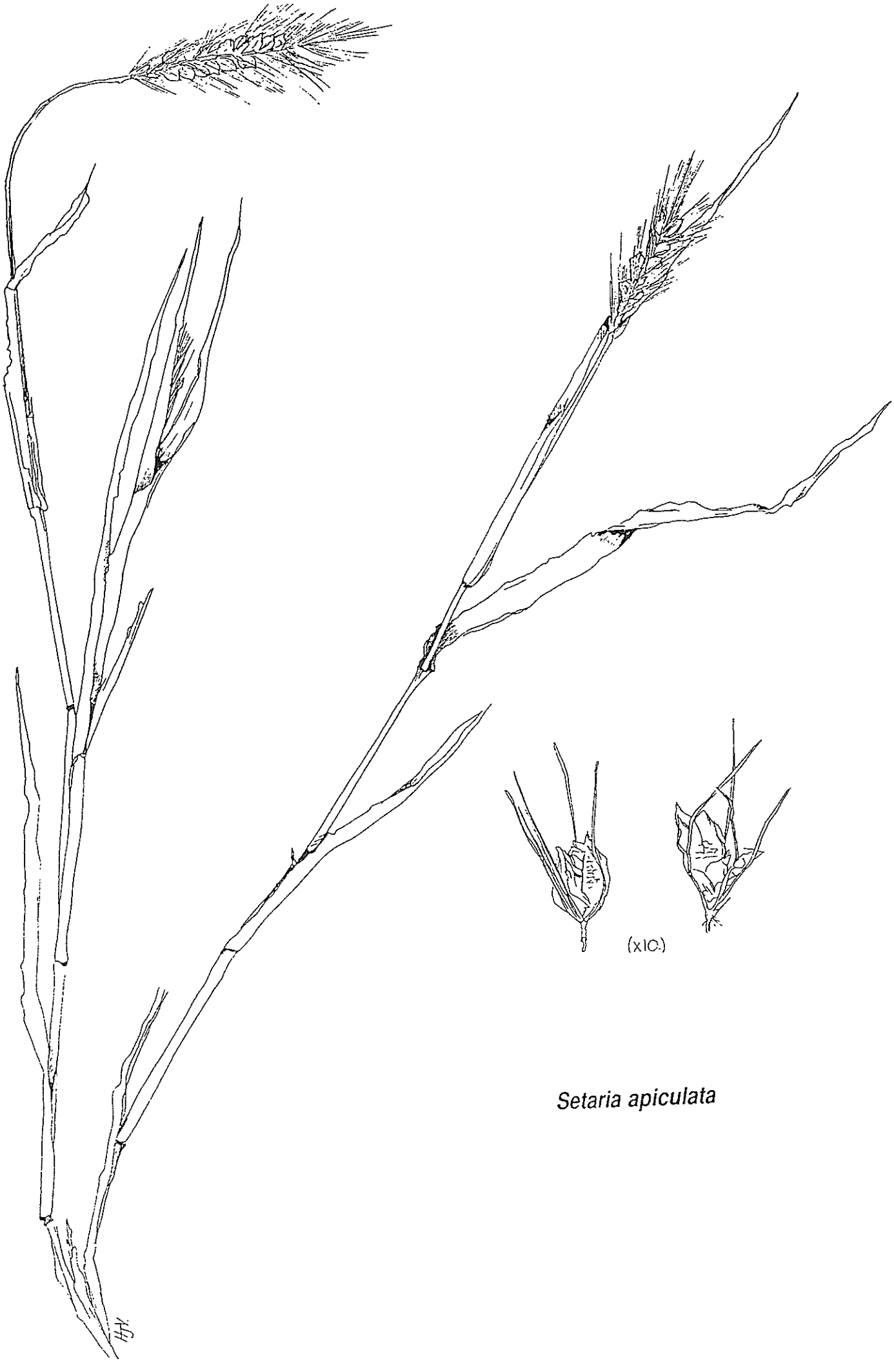
Grazing Value and Management:
While only providing low value forage, Whitegrass is however a decreaser species if heavily grazed. It contributes significantly to the amount of pasture available on many red soil areas.



Nutritional Information:
A low value nutritive source.

Ref.: D.Wilson, pers.comm.	Wet Season	Dry Season
Digestibility %	49.0	27.0
Crude Protein %	6.2	1.2
Phosphorus %	0.10	0.02

Further Information: 4, 32



Setaria apiculata

Pigeon Grass

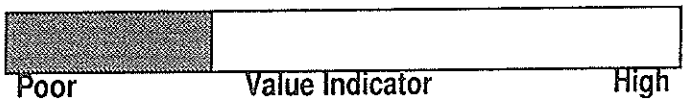
Native Setaria

Botanical name: *Setaria apiculata*

Description:
A weak stemmed, ascending, tufted annual to 1.0m in tall pastures but often half that height. The thin and hairless stems bend at the lower nodes and have a purplish pigmentation at their base. Plant habit tends to be spreading rather than erect if grazed. Seed head is dense, bristly and terminal on the flowering stem. Floral spikelets on the central axis are whitish and leave the bristles intact when the seed falls.

Habitats and Distribution:
Preferring sandy soil types, Pigeon grass is an occupant of medium to high rainfall zones.

Grazing Value and Management:
Of moderate grazing value, it is a useful but minor component of native pastures.



Nutritional Information:
None available.

Further Information: 32

Sorghum plumosum

Plume Sorghum

Perennial Sorghum

Botanical name: *Sorghum plumosum*

Description:

A leafy, tussock forming perennial up to 1.5m tall, with a hardy root system and often rhizomes. The leaf sheath opening is bearded, and leaf blades are smooth with sharp edges. Seed head open, leafy and with several flat floral spikelets on each branchlet. Long rough awns from upper flowers.

Habitats and Distribution:

Found on floodplains, creekbanks and depressions, it favours medium textured soils in areas of high rainfall. Often in association with Golden Beard Grass (*Chrysopogon fallax*), Soft Spinifex (*Plectrachne pungens*), and Curly Bluegrass (*Dichanthium fecundum*).

Grazing Value and Management:

It is a palatable perennial. Its' strong root system enables the plant to remain green for long into the dry season, and provide green pick for grazing stock. A decreaser species, it will decline under a heavy grazing regime. It is generally the first perennial grass to disappear from tallgrass pastures on red soils in the Northern V.R.D., Sturt Plateau and Katherine areas.

Nutritional Information:

	Wet Season	Dry Season
Digestibility %		
Crude Protein %		2.3
Phosphorus %		0.09 n=1

Further Information: 4, 20, 32


Sporobolus australasicus
HJV.

Fairy Grass

Australian Dropseed

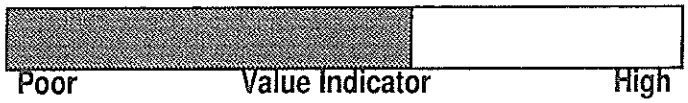
Botanical name: *Sporobolus australasicus*

Colour Plate: Page 51

Description:
A short erect annual (occasionally biennial) to 40cm tall, with a leafy base. Stems are hairless, leaf sheaths are loose and the wide leaf blades are broadly pointed with spiny hairs along a thickened whitish margin. The awnless seed head is loose, open and pyramid shaped (10cm long by 5cm wide) and contains small dark globular seeds.

Habitats and Distribution:
Most preferring loam flats, Fairy grass will be found on a wide range of soils.

Grazing Value and Management:
A palatable species readily consumed by stock, even in its mature dry state. Produces very little herbage and so provides dry season grazing only for a limited period. May be a first coloniser of bare areas.



Nutritional Information:

	Wet Season	Dry Season
Digestibility %	60.0	49.0
Crude Protein %	13.4	4.4
Phosphorus %	0.17	0.08 n=4

Further Information: 2, 4, 20, 32

Themeda triandra

Kangaroo Grass

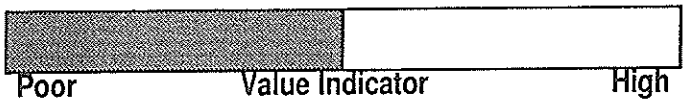
Botanical name: *Themeda triandra* (formerly *T. australis*)

Colour Plate: Page 47

Description:
A leafy, tussock forming perennial to 1.0m tall. Short leaf sheaths, the basal sheaths being acutely ridged. Leaf blade is generally flat or slightly folded; smooth, and with small hairy appendages at its base. The seed head is loose and long, spikelets are leafy with a long awn (5-7cm), similar in appearance to the Flinders grasses (*Iseilema* spp.), but droop downwards on their slender branchlets.

Habitats and Distribution:
Occurs on red earths of the Northern V.R.D and Sturt Plateau, and on shallow soils along creekbanks. Often associated with Whitegrass (*Sehima nervosum*), Golden Beard Grass (*Chrysopogon fallax*), and Plume Sorghum (*Sorghum plumosum*).

Grazing Value and Management:
Of moderate palatability when green, and coarse at maturity, Kangaroo Grass will provide good feed but will rapidly disappear from overgrazed pastures *i.e.* it is a decreaser species.



Nutritional Information:
Moderately nutritious early in the growing season, it steadily declines in value as standing dry feed.

	Wet Season	Dry Season
Digestibility %		42.0
Crude Protein %	5.70	1.8
Phosphorus %	0.10 n=2	0.01 n=1

Further Information: 4, 20, 32, 41

Tragus australianus

Sock-burr Grass

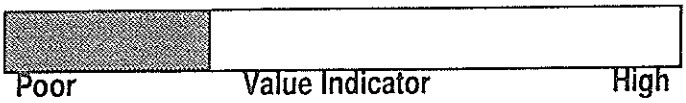
Small Burrgrass

Botanical name: *Tragus australianus*

Description:
A semi-erect annual to 40cm high. Stems are rough and hairy, bent, branching, and often rooting at the lower nodes. Flat leaf blades to 6cm long with thickened, hairy white margins and a rounded base. The seed head consists of distinctive burr-like spikelets on a central stem.

Habitats and Distribution:
An inhabitant of drier localities, mostly on sandy and lighter soils.

Grazing Value and Management:
May be an increaser species, or coloniser of bare ground. Reasonably nutritious but provides only light bulk.



Nutritional Information:

	Wet Season	Dry Season
Digestibility %	55.0	
Crude Protein %	12.4	5.6
Phosphorus %	0.14 n=1	

Further Information: 20, 32, 41

Urochloa mosambicensis

Sabi Grass

Urochloa

Botanical name: *Urochloa mosambicensis*

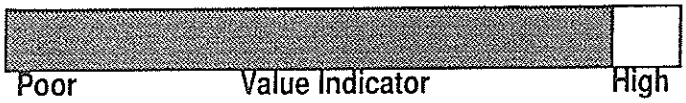
Colour Plate: Page 48

Description:
A sprawling to upright leafy perennial with stems up to 1.0m high. Lower stem joints will root, upper joints may branch. Stem joints are covered with short silky hairs. Leaf blades are wide (15mm), long (20cm), hairy on both sides, and have a fine tapering point. Flowering stems produce 4 to 12 seed stalks. Two rows of flattened floral spikelets with pointed tips, on one side of the seed stalk only.

Habitats and Distribution:
An introduced species from Africa, it is now considered naturalised in some areas of the N.T. Grows on a wide range of soil types from clay loams to red sandy soils.

Grazing Value and Management:
A very palatable species, it can withstand heavy grazing. Responds quickly to early rains, providing nutritious feed. Not difficult to establish, it is fire and drought resistant, but has no tolerance to flooding or waterlogging.

Sabi Grass is a useful improved pasture species, particularly as part of a mixed grass/legume stand with Verano stylo. It responds well to added fertiliser.



Nutritional Information:
Nutritional value is good during the growing season but as with all perennials, it declines steadily during the dry.

	Wet Season	Dry Season
Digestibility %	60.0	49.0
Crude Protein %	9.1	7.6
Phosphorus %	0.20	0.10

Further Information: 4, 6, 32

Whiteochloa cymbiformis

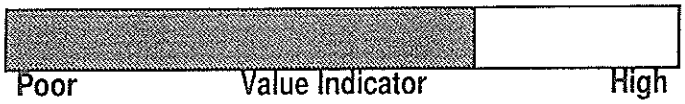
Native Panic

Botanical name: *Whiteochloa cymbiformis* (*Panicum cymbiforme*)

Description:
A tufted erect annual 1.5-2.0m tall, often rooting at the lower nodes. Short, loose leaf sheaths with flat and strongly veined leaf blades. The flowering part is long (to 50cm), very loose with spaced branches, and often droops toward the ground to give the plant a weeping appearance. The spikelets are paired and crowded on the branchlets.

Habitats and Distribution:
Will be found on alluvial red soils in river valleys.

Grazing Value and Management:
A palatable plant when green, it provides a useful source of fodder due to its high bulk production.



Nutritional Information:
None available.

Further Information: 32

Plate 1: Weeping Mitchell Grass (*Astrebla elymoides*)

Plate 2: *Astrebla elymoides* seedhead

Plate 3: *Astrebla pectinata* seedhead

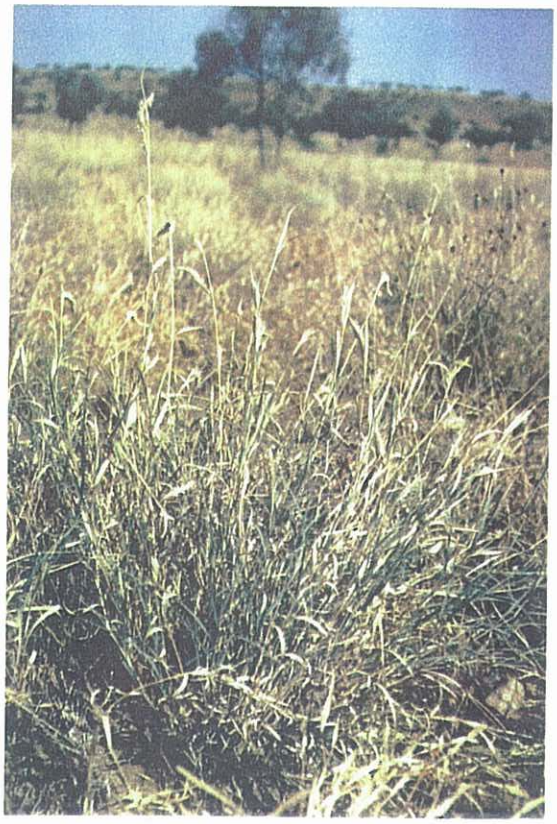


Plate 4: Barley Mitchell Grass (*Astrebla pectinata*)

Plate 5: Native Millet (*Panicum decompositum*)

Plate 6: Silky Browntop (*Eulalia aurea*)

Plate 7: *Eulalia aurea* seedhead

Plate 8: Bluegrass (*Dicanthium* sp.) seedhead

Plate 9: Kangaroo Grass (*Themeda triandra*)

Plate 10: *Chrysopogon fallax* seedhead

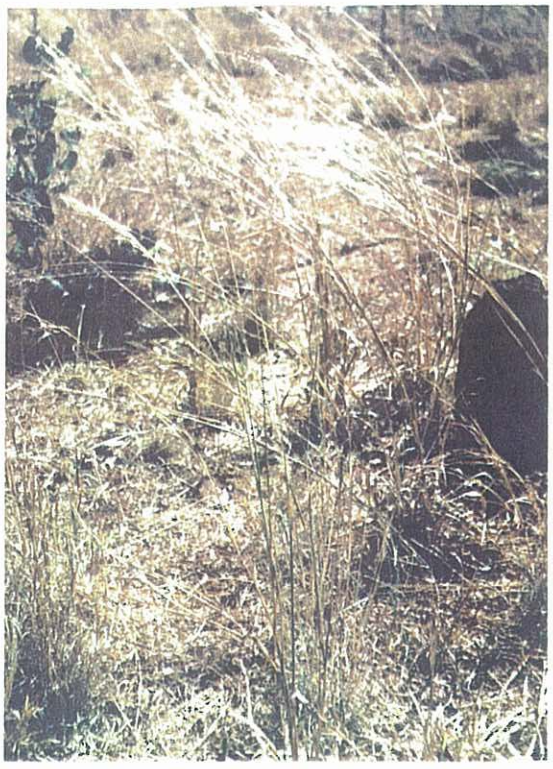


Plate 11: Golden Beard Grass (*Chrysopogon fallax*)

Plate 12: Buffel Grass (*Cenchrus ciliaris*)

Plate 13: *Cenchrus ciliaris* seedhead

Plate 14: *Cenchrus setiger* seedhead

Plate 15: Birdwood Grass (*Cenchrus setiger*)

Plate 16: Sabi Grass (*Urochloa mosambicensis*)

Plate 17: *Urochloa mosambicensis* seedhead

Plate 18: *Aristida latifolia* seedhead

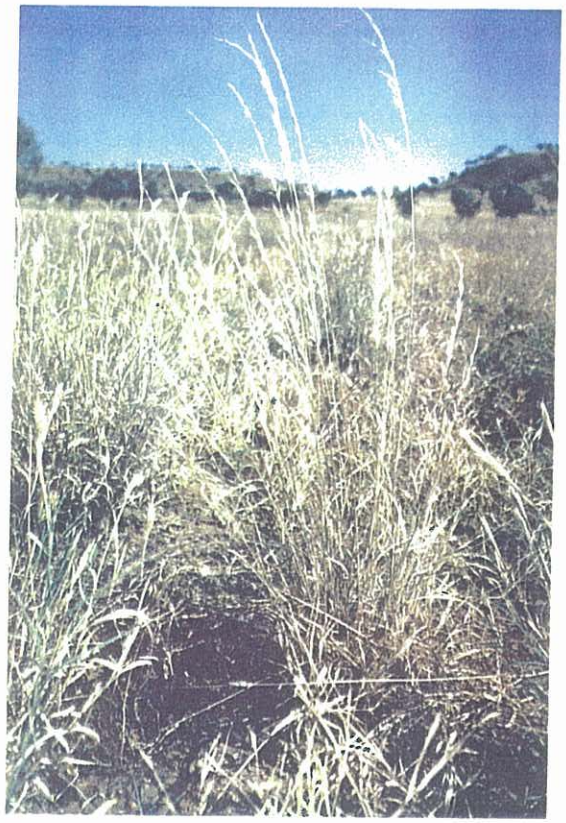


Plate 19: Feathertop Wiregrass (*Aristida latifolia*) amongst Mitchell Grass

Plate 20: Wild Rhodes Grass (*Chloris inflata*)

Plate 21: *Chloris inflata* seedhead

Plate 22: Black Speargrass (*Heteropogon contortus*)

Plate 23: *Iseilema* species inflorescence

Plate 24: Flinders Grass (*Iseilema* species)

Plate 25: *Iseilema* species inflorescence

Plate 26: *Brachiaria* species seedhead

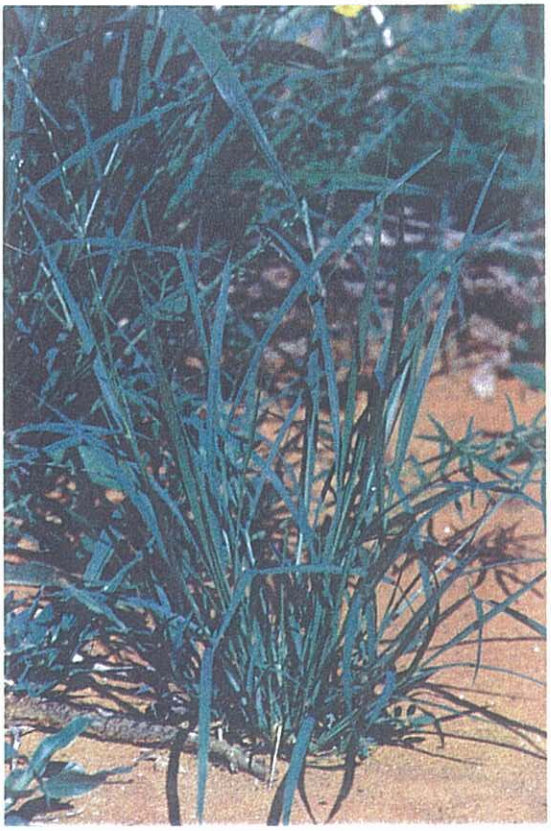


Plate 27: Summer Grass (*Brachiaria* species)

Plate 28: Coast Button Grass (*Dactyloctenium aegyptiu*

Plate 29: Limestone Grass (*Enneapogon polyphyllus*)

Plate 30: *Enneapogon polyphyllus* inflorescence

Plate 31: A Wiregrass (*Eriachne*)

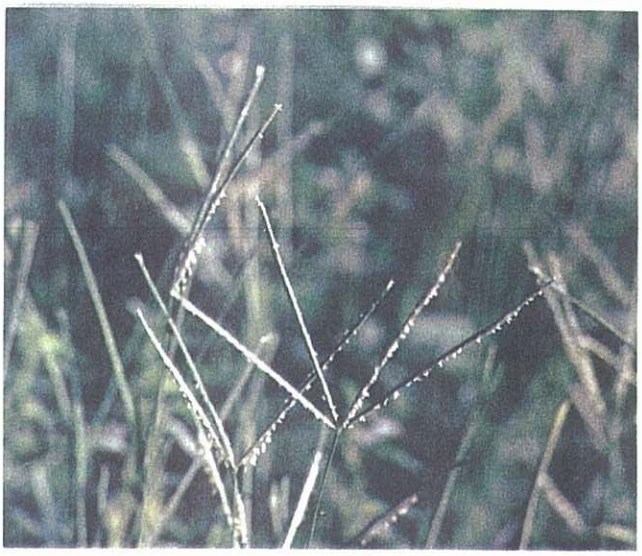


Plate 32: Native Couch (*Brachyachne convergens*)

Plate 33: Digit Grass (*Digitaria* species)

Plate 34: Fairy Grass (*Sporobolus australasicus*)

PART 2

Forb Species

Abelmoschus ficulneaus

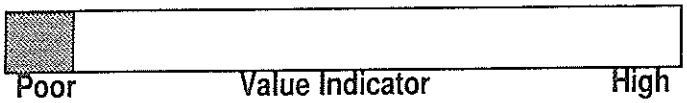
Native Rosella

Botanical name: *Abelmoschus ficulneaus*

Description:
Erect woody annual up to 2m. White Hibiscus-like flowers, turning pink with dark purple centres, in upper leaf forks. Alternate leaves up to 10cm long with 3-5 serrated lobes. Sticky, hairy sausage shaped pods with 5 segments containing rounded black seeds.

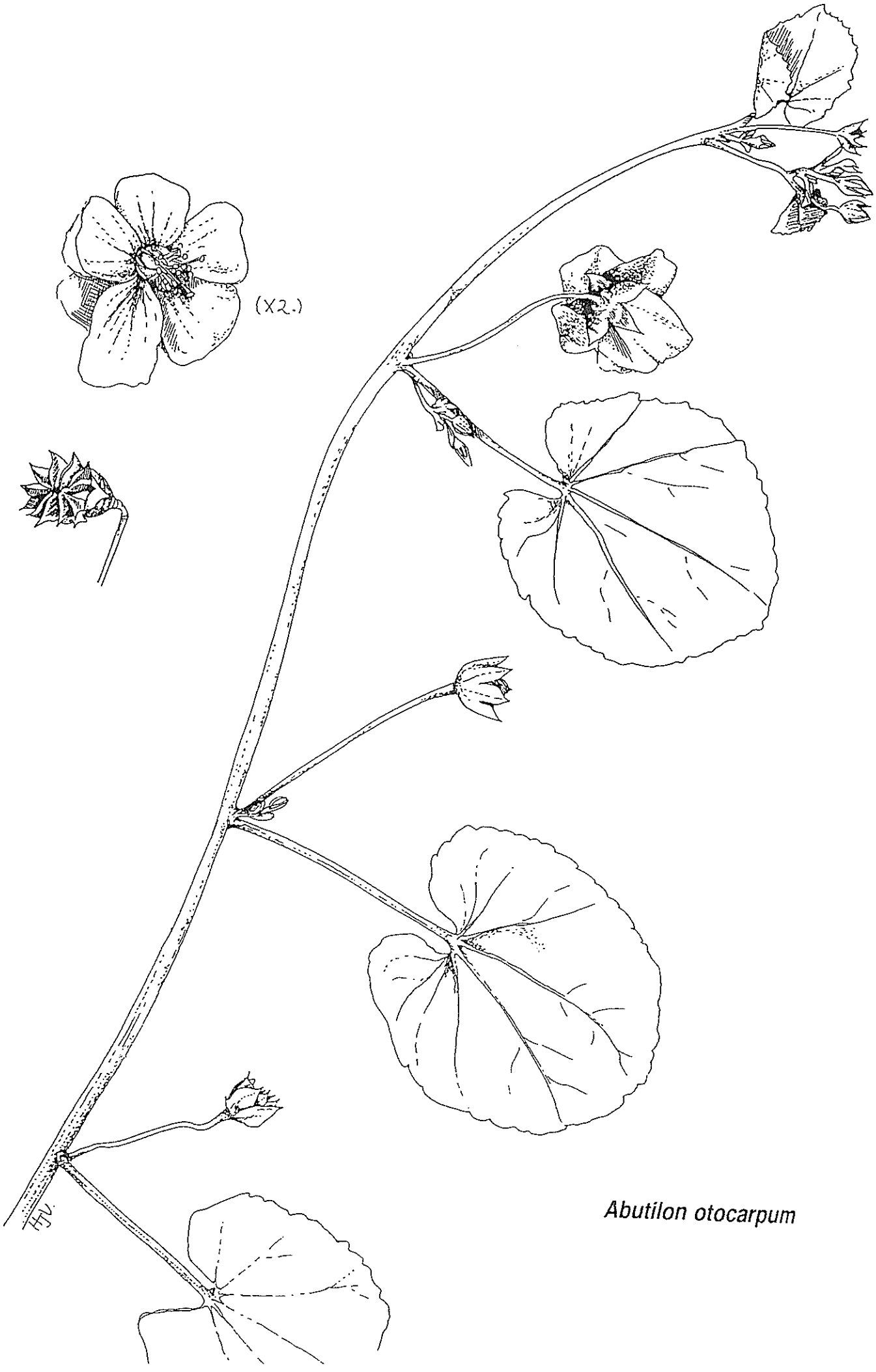
Habitats and Distribution:
Native to black soil areas, it sometimes grows profusely after opening rains.

Grazing Value and Management:
Palatability is very low. Not known to be grazed except in desperation.



Nutritional Information:
None available.

Further Information: 21



Abutilon otocarpum

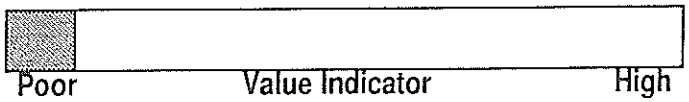
Desert Chinese Lantern

Botanical name: *Abutilon otocarpum*

Description:
Small low annual, densely covered with soft hairs. Leaves are broadly ovate or more or less circular, about 10-70 mm long and 10-60mm wide. Flowering occurs form January to August. Yellow flowers arise on solitary stalks from leaf axils. Seeds are roughly kidney shaped.

Habitats and Distribution:
Sample collected on calcareous red earth.

Grazing Value and Management:



Nutritional Information:

	Wet Season	Dry Season
Digestibility %	62.0	
Crude Protein %	16.0	
Phosphorus %	0.21 n=1	

Further Information: 20, 48

Aerva javanica

Kapok Bush

Snow Bush

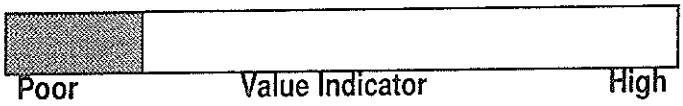
Botanical name: *Aerva javanica*

Colour Plate: Page 84

Description:
A much branched shrubby perennial, covered with short hairs, up to 1m. Alternate leaves are long, narrow, blue-green, and leathery. The profuse white flowers grow on spikes and the seed is a black speck within short white fibres.

Habitats and Distribution:
Kapok bush is an introduced species from the Middle East and Asia. It is a coloniser of disturbed soils, and this has proved useful in rangeland reclamation.

Grazing Value and Management:
Tends only to be grazed if pastures are sparse.



Nutritional Information:

	Wet Season	Dry Season
Digestibility %	57.0	46.0
Crude Protein %	15.3	9.9
Phosphorus %	0.16	0.12

Further Information: 20, 32

Bonamia media

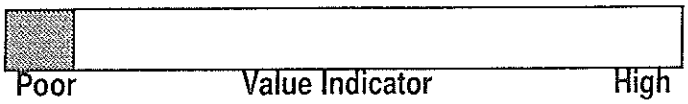
Bonamia

Botanical name: *Bonamia media*

Description:
Prostrate herb with moderate covering of pale brown to greyish hairs, becoming less hairy with age. Flowers are white or rarely blue.

Habitats and Distribution:
Occurs on red sandy soils. Minor component of V.R.D. pastures. More obvious where grasses have been grazed out and may be a coloniser of bare areas.

Grazing Value and Management:
Not thought to be a normal component of the diet.



Nutritional Information:

	Wet Season	Dry Season
Digestibility %	51.0	54.0
Crude Protein %	15.5	10.2
Phosphorus %	0.19	0.10

Further Information: 20, 48

Cassia occidentalis

Coffee Senna

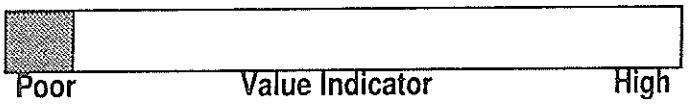
Botanical name: *Cassia occidentalis*

Colour Plate: Page 83

Description:
Annual to short lived perennial which grows to 2m high. Stems are smooth and woody at the base. Leaves are compound, consisting of 3-5 pairs of leaflets. Leaves have a large dark gland where they join the stem. Yellow flowers grow on short stalks near the end of branches. Seeds are produced in smooth flattened bean like pods about 10cm long and 1cm wide.

Habitats and Distribution:
A native of tropical America it is considered to be an early introduction to Australia.

Grazing Value and Management:
Not known to be selected for. Seeds contain toxins. Coffee Senna is designated a noxious weed in the Northern Territory; Class B (spread to be controlled) and Class C (introduction to be prevented).



Nutritional Information:
None available.

Further Information: 43, 48

Cleome viscosa

Tickweed
Mustard Bush

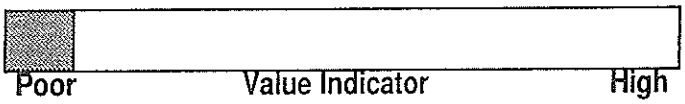
Botanical name: *Cleome viscosa*

Colour Plate: Page 84

Description:
Annual erect herb 0.5-1.0m tall, exuding a strong scent. Stems are covered with fine, sticky hairs. Alternate, dull-green leaves lance-like and 3-5 foliate. Yellow flowers occur solitarily in upper leaf axils, and the pods are long, thin, and cylindrical.

Habitats and Distribution:
Tends to favour sandy soils on open to sparse woodlands, sandstone country, escarpments, and rocky slopes. Is a widespread weed of roadsides, disturbed areas, and where competition from perennials is minor.

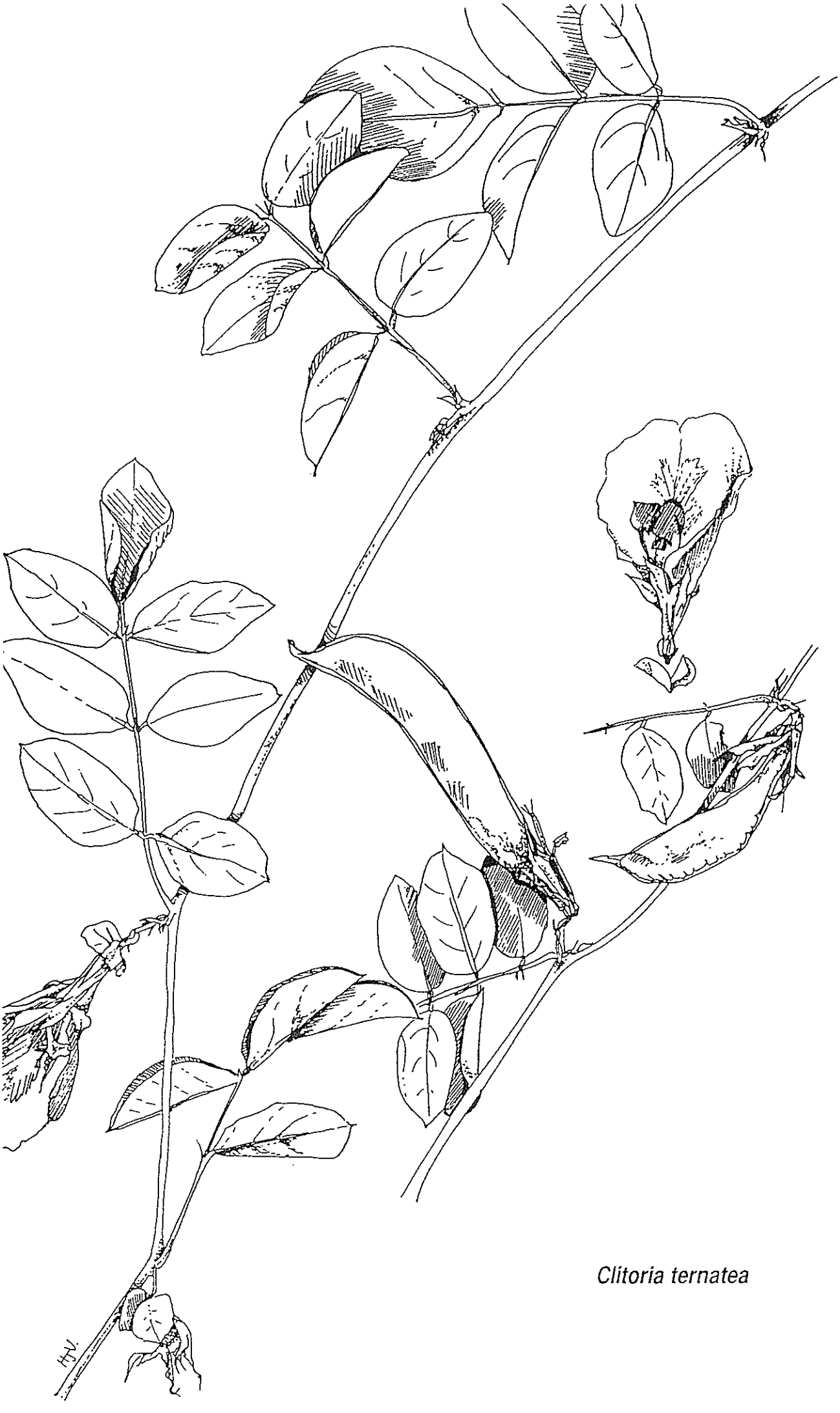
Grazing Value and Management:
Of very low palatability, it is an increaser species on over-utilised areas. Appears to be favoured by horses when in flower and seeding. Provides only low bulk.



Nutritional Information:
None available.

Reference: 28	Wet Season	Dry Season
Digestibility %	57.0	
Crude Protein %	14.6	
Phosphorus %	0.20	

Further Information: 3, 20, 21, 32



Clitoria ternatea

Blue Pea

Butterfly Pea

Botanical name: *Clitorea ternatea*

Description:

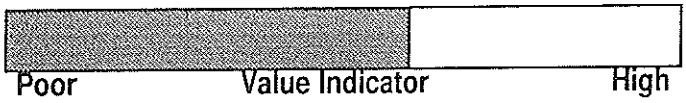
Perennial, twining, herbaceous vine with stems up to 5m long from a woody rootstock. Broad 5-7 foliate leaflets, hairless on the upper surface with short hairs underneath, arranged on a common petiole. Single, showy, pea-like flowers, blue with pale yellow at base. Pods are long, flattened, and contain up to 10 dark, plump, oval seeds.

Habitats and Distribution:

Introduced as a pasture species and some cultivars as ornamentals, it grows on moist and clay soils.

Grazing Value and Management:

A pasture species for the seasonally dry tropics, it is quite palatable to stock. It is not tolerant of prolonged heavy stocking during the wet as the growing tips are continually removed. It provides good quality dry season fodder. It has never persisted as a pasture.



Nutritional Information:

Nutrient content is ideal for animal production.

	Wet Season	Dry Season
Digestibility %		
Crude Protein %	17.0	9.50
Phosphorus %	0.25	0.12

Further Information: 4, 18

Commelina lanceolata

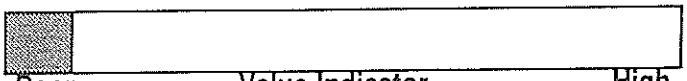
Wandering Jew

Botanical name: *Commelina lanceolata*

Description:
Annual or perennial herb, usually slender and spreading. Stems are often predominantly ribbed. Leaves alternate and flowers blue to violet.

Habitats and Distribution:
Occurs on floodplains and other moist situations, commonly on black soils.

Grazing Value and Management:
Not thought to be of any pastoral significance.



Nutritional Information:
None available.

Further Information: 48

Rattlepod

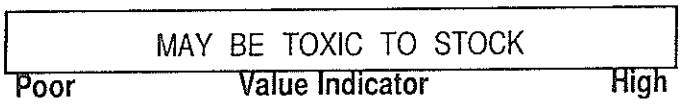
Botanical name: *Crotalaria* spp.

Colour Plate: Page 84

Description:
Herbaceous to shrubs, they generally have pea-shaped pods, yellow or sometimes mauve flowers, and inflated pods which rattle with loose seeds at maturity (hence the common name).

Habitats and Distribution:
Many species occur across northern Australia, but only those with pastoral significance in the VRD are included here.

Grazing Value and Management:
Certain species cause "Walkabout" disease in horses at times of pasture shortage. Symptoms are weight loss, twitching, and aimless wandering.



Further Information: 10, 18, 20, 32

Crotalaria crispata

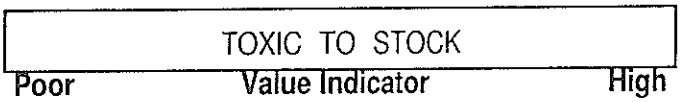
Kimberley Horse Poison

Botanical name: *Crotalaria crispata*

Description:
Erect or spreading, well branched annual or short-lived perennial to 50cm tall. Stems densely covered with brown hairs. Alternate gray-green leaves densely covered with hairs on both sides. Terminal pea shaped flowers are yellow to yellow-green. Has a small hairy pod with 1-2 dark brown, kidney shaped seeds.

Habitats and Distribution:
Found on sandy plains near heavier soil margins and along watercourses, in medium to high rainfall areas.

Grazing Value and Management:
Not normally palatable to stock, it may however be consumed in times of nutritional stress leading to an accumulation of alkaloid toxins in the liver and possibly "Walkabout" disease.



Further Information: 10, 18, 20, 32

Crotalaria medicaginea

Cloverleaf Rattlepod

Trefoil Rattlepod

Botanical name: *Crotalaria medicaginea* (Formerly *C. trifoliastrum*)

Description:

A very variable species, it is usually an erect annual or short-lived perennial shrub to 1.0-1.5m high. The crowded trifoliate (clover-like) leaves are narrow and hairless on the upper surface. Clusters of yellow flowers borne near the end of the stems. The fruit is globular, containing 1 or 2 heart shaped red-brown seeds.

Habitats and Distribution:

A widely distributed species growing on light (sandy) and medium (loamy) textured soils.

Grazing Value and Management:

Occasionally grazed by livestock. Some suggestion that this Crotalaria species may induce a liver disorder, but little firm evidence.

MAY BE TOXIC TO STOCK

Poor **Value Indicator** **High**

Further Information: 10, 18, 20, 32

Cucumis melo ssp *agrestis*

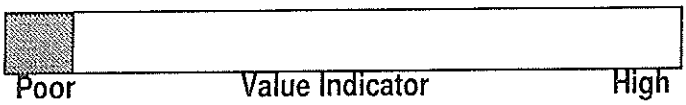
Paddy Melon

Botanical name: *Cucumis melo* ssp. *agrestis*

Description:
Twining annual bristly herb, or sometimes with perennial rootstock. Broad lobed leaves with serrated margins and a heart shaped base. Yellow male flowers in clusters on stalks; female flowers solitary or paired. Fruit is ovoid, greenish, and contains numerous pale seeds.

Habitats and Distribution:
Along watercourse fringes. Minor component on various soil types, particularly calcareous red earths.

Grazing Value and Management:
No grazing value.



Nutritional Information:
Nutritional analysis suggests a valuable feed source.

	Wet Season	Early Dry Season
Digestibility %	71.0	69.0
Crude Protein %	16.1	15.9
Phosphorus %	0.25	0.23

Further Information: 2, 20

Bulbostylis barbata

Rhyncospora exserta

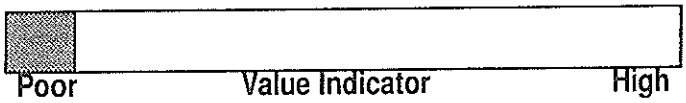
Sedges

Botanical name: *Bulbostylis barbata*
Fimbristylis spp. - Water Grass
Rhyncospora exserta

Description:
Grass-like herbs, sometimes perennial. Leaves grow from base and are usually narrow. Simple uni- or bisexual flowers are small and often clustered on spikes. The fruit is a small nut.

Habitats and Distribution:
Rarely dominant, the sedges often occur with grasses in wetter areas *e.g.* creek banks, wet depressions, clay pans, and black soil swamps. Some species however, occur in more arid environments of lower rainfall and sandy soil.

Grazing Value and Management:
Of little grazing value, although some species are moderately grazed when young.



Nutritional Information:
Little available.

	Wet Season	Dry Season
Digestibility %		47.0
Crude Protein %		5.9
Phosphorus %		0.13 n=2

Further Information: 20, 32

Gossypium australe

Wild Cotton
Native Cotton

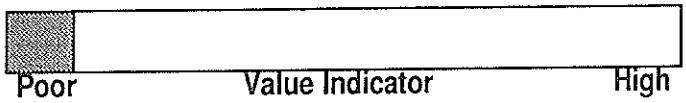
Botanical name: *Gossypium australe*

Colour Plate: Page 84

Description:
An erect perennial shrub 1-3m tall. Alternate, dull green leaves are large, soft and hairy. The hibiscus-like flowers occurring solitarily in the leaf axils are white to pink with a maroon centre. Flowers throughout the dry season. Oval shaped pods are hairy, woody capsules 10-15mm long.

Habitats and Distribution:
Found in open woodlands and savanna grassland plains. Grows in shallow gravelly to sandy soils and is widespread in drier areas.

Grazing Value and Management:
Wild Cotton is not considered to be grazed by livestock. A close relative of cotton, there is a possibility the seeds may be poisonous.



Nutritional Information:
None available.

Reference: 28	Wet Season	Dry Season
Digestibility %	54.8	
Crude Protein %	10.2	
Phosphorus %	0.13	

Further Information: 3, 20, 32

Heliotropium tenuifolium

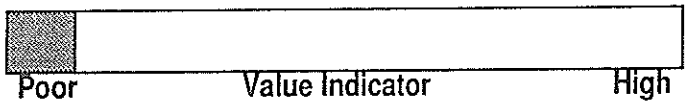
Heliotrope

Botanical name: *Heliotropium tenuifolium*

Description:
An erect woody herb. Stems have silky grey hairs; leaves narrowly linear; and the loosely clustered white flowers are terminal on branches. The fruit splits into four single-seeded segments.

Habitats and Distribution:
A widespread species growing in a variety of habitats. It is a common forb component of pastures on calcareous and basalt soils in the Central and Southern V.R.D.

Grazing Value and Management:
It has no nutritional or pastoral significance, but other members of the genus are toxic in other parts of Australia. It can rapidly increase and take over overgrazed country.



Nutritional Information:
None available.

Further Information: 20

Hibiscus panduriformis

Yellow Hibiscus

Botanical name: *Hibiscus panduriformis*

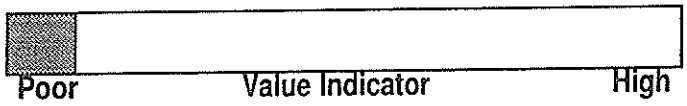
Colour Plate: Page 84

Description:
An erect shrub 1-2m tall, with grey-green stems covered in soft velvety hairs. Alternate leaves are wide with a heart-shaped base and serrated margins.The large flowers are bright yellow with maroon centre and occur singly in the leaf axils. Flowering is during the dry season. Pods are very hairy, ovoid capsules containing small kidney-shaped seeds.

Habitats and Distribution:
Most commonly found on stream banks and the margins of black soil plains. The gravelly sandy soils of open savanna woodland will support Yellow Hibiscus in lower rainfall areas.

Other species of Hibiscus occur in the VRD, and are of similar value.

Grazing Value and Management:
Not thought to be grazed by livestock, it has the ability to increase in density, particularly along waterways.



Nutritional Information:

	Wet Season	Dry Season
Digestibility %		46.0
Crude Protein %		9.2
Phosphorus %		0.12 n=2

Further Information: 3, 4, 20, 32

Indigofera linnaei

Birdsville Indigo

Botanical name: *Indigofera linnaei*

Description:
A prostrate, herbaceous annual or short-lived perennial with a strong tap root and many branched stems. Leaves are pinnate (fern-like) with 7-9 grey-green, club shaped leaflets alternately arranged along the common petiole. Bright red, pea shaped flowers produce very small grey seed pods containing two light brown and almost cubic seeds.

Habitats and Distribution:
Many Indigos occur throughout the VRD. They are drought tolerant and widespread on sandy soils and overgrazed areas.

Grazing Value and Management:
Some *Indigofera* spp. (in particular Birdsville Indigo) contain a toxic alkaloid called Indospicine. If horses consume these plants over a prolonged period, the symptoms of Birdsville Disease may appear (*i.e.* depression, unsteadiness, dragging rear hooves while high stepping the front legs). The meat from affected horses also contains indospicine and is toxic to dogs *i.e.* is unsuitable for pet food.

The Indigos do not appear to effect cattle, to which they are very palatable during the growing season.

TOXIC TO HORSES		
Poor	**Value Indicator**	**High**

Nutritional Information:

	Wet Season	Dry Season
Digestibility %	70.0	
Crude Protein %	15.4	
Phosphorus %	0.17	

Further Information: 2, 7, 10, 18, 21, 41

Malvastrum spicatum

Spiked Malvastrum

Spiked Mallow

Botanical name: *Malvastrum spicatum*

Description:
Erect branching woody based perennial up to 60cm high. Hairy stem. Alternate leaves, broad and tapering and unevenly serrated.

Habitats and Distribution:
A native of tropical America, it is now widespread in many semi-arid tropical and sub-tropical regions. Occurs in sandy or rocky soils along watercourses and roadsides.

Grazing Value and Management:
It is not considered to be of pastoral significance.

MAY BE TOXIC TO STOCK

Poor Value Indicator High

Further Information: 10, 20, 21, 48

Neptunia dimorphantha

Sensitive Plant

Botanical name: *Neptunia monosperma*

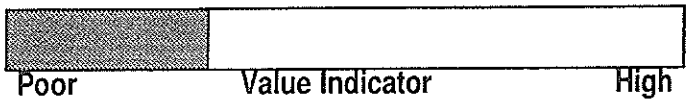
Colour Plate: Page 84

Description:
A perennial herb with prostrate to ascending stems. Leaves are bipinnate (complex fern-like) with between 20 and 39 leaflet pairs along the petioles, themselves paired along the central leaf stem. Oval glands terminal on leaf stem and at the base of each petiole pair. Yellow flowers are spherically clustered at the end of a stalk arising from the leaf axil. Flattened pods are almost circular, dark brown, and generally contain one similar shaped seed.

A similar species *Neptunia dimorphantha* is also found in the VRD, differing by less leaflet pairs (up to 20) and number and location of the leaf glands. May be a coloniser of bare soils.

Habitats and Distribution:
A wide range of soil types, from sandy to clay. Has been observed on black soil.

Grazing Value and Management:
Of moderate value as a mixed pasture species, it is palatable to stock until the mid dry season when it tends to lose its leaves. Producing a modest bulk and drying off quickly as the season ends, its usefulness is restricted. It is a minor part of the animal diet.



Nutritional Information:

	Wet Season	Dry Season
Digestibility %	52.0	
Crude Protein %	18.5	
Phosphorus %	0.20 n=5	

Further Information: 18, 20, 32

Passiflora foetida

Wild Passionfruit

Stinking Passionfruit

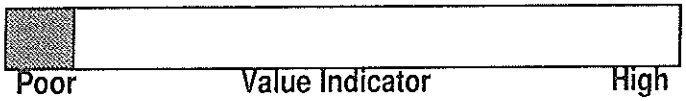
Botanical name: *Passiflora foetida*

Colour Plate: Page 83

Description:
A climbing, twining vine with thin, hairy stems and gripping tendrils, securing the plant to its supportive habitat. Alternate, broad, pale green leaves 5-7cm long have a heart-shaped base. They consist of three lobes of which the central is largest with a pointed apex and are soft and velvety on both sides. Pale purple to white flowers 3-4cm across occur singly in the leaf forks. Fruit is an ovoid capsule, orange when ripe, surrounded by lace-like filaments, and containing black seeds in a pulp.

Habitats and Distribution:
Introduced from South America, it is now widespread throughout northern Australia. Preferring sandy soils, it is very common along watercourses, creekbanks, and roadsides.

Grazing Value and Management:
While the ripe fruit is edible, the leaves and immature fruits may contain hydrocyanic (prussic) acid and be toxic to grazing livestock if consumed in large quantities - not a common occurrence as animals need to be very hungry to eat sufficient amounts.



Nutritional Information:
None available.

Further Information: 10, 21, 32

Phyllanthus maderaspatanus var *angustifolius*

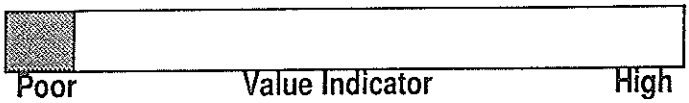
Phyllanthus

Botanical name: *Phyllanthus maderaspatanus* var *angustifolius*

Description:
An erect, branched perennial herb. Alternate leaves to 4cm long are widely linear, strongly veined, with a rounded apex and ending in a short point. Separate male and female flowers are small and grow in leaf axils. The seed pod is small and contains minute (1mm) seeds.

Habitats and Distribution:
Wide variety of soil types from sandy through loam to clays.

Grazing Value and Management:
A minor forb component, common on bare or overgrazed areas. Not thought to be of any pastoral significance.



Nutritional Information:

	Wet Season	Dry Season
Digestibility %	39.0	33.0
Crude Protein %	6.7	3.2
Phosphorus %	0.10	0.04

Further Information: 2, 20

Physalis minima

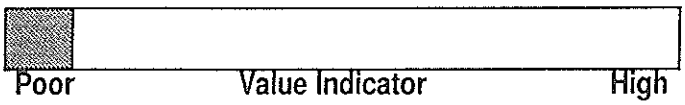
Wild Gooseberry

Botanical name: *Physalis minima*

Description:
A bushy erect annual forb, usually 30cm but up to 1.0m high, with spreading branches. Alternate pale green leaves up to 10cm long ending in a point, and to 5cm wide with irregularly serrated margins. The pale yellow flowers are cup-shaped and occur singly in the leaf forks. The many angled, papery husk encloses a yellow berry.

Habitats and Distribution:
Widespread and regarded as a weed. It is frequently found in conjunction with river systems.

Grazing Value and Management:
Not thought to be of pastoral significance.



Nutritional Information:
None available.

Further Information: 21, 48

Pimelea punicea

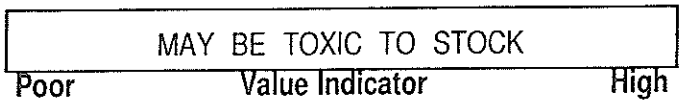
Pimelea

Botanical name: *Pimelea punicea*

Description:
Annual erect herb 0.2-0.6m high. Leaves are usually 12-52mm long and 3-8mm wide. Flowers are deep red and occur all year.

Habitats and Distribution:
Recorded mainly in sandy soils, often in rocky ground.

Grazing Value and Management:
Other species in this genus are suspected of containing toxins but this species has not been noticed to be grazed by animals or implicated in toxicity.



Nutritional Information:
None available.

Further Information: 48

Ptilotus exaltatus

Tall Mulla Mulla

Pink/Purple Mulla Mulla, Pussy Tail

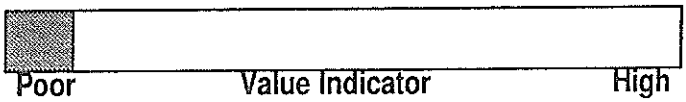
Botanical name: *Ptilotus exaltatus*

Colour Plate: Page 83

Description:
An erect annual growing to 1.5m tall under good conditions, but usually shorter. Initially grows as a prostrate rosette before shooting erect, branched, flowering stems. Large (20cm by 7cm) and fleshy, dark green leaves are shiny and broad. Hairless except for the young leaves. The flowering head is a cylindrical spike containing many distinctive purple-mauve flowers, prominent during the late wet.

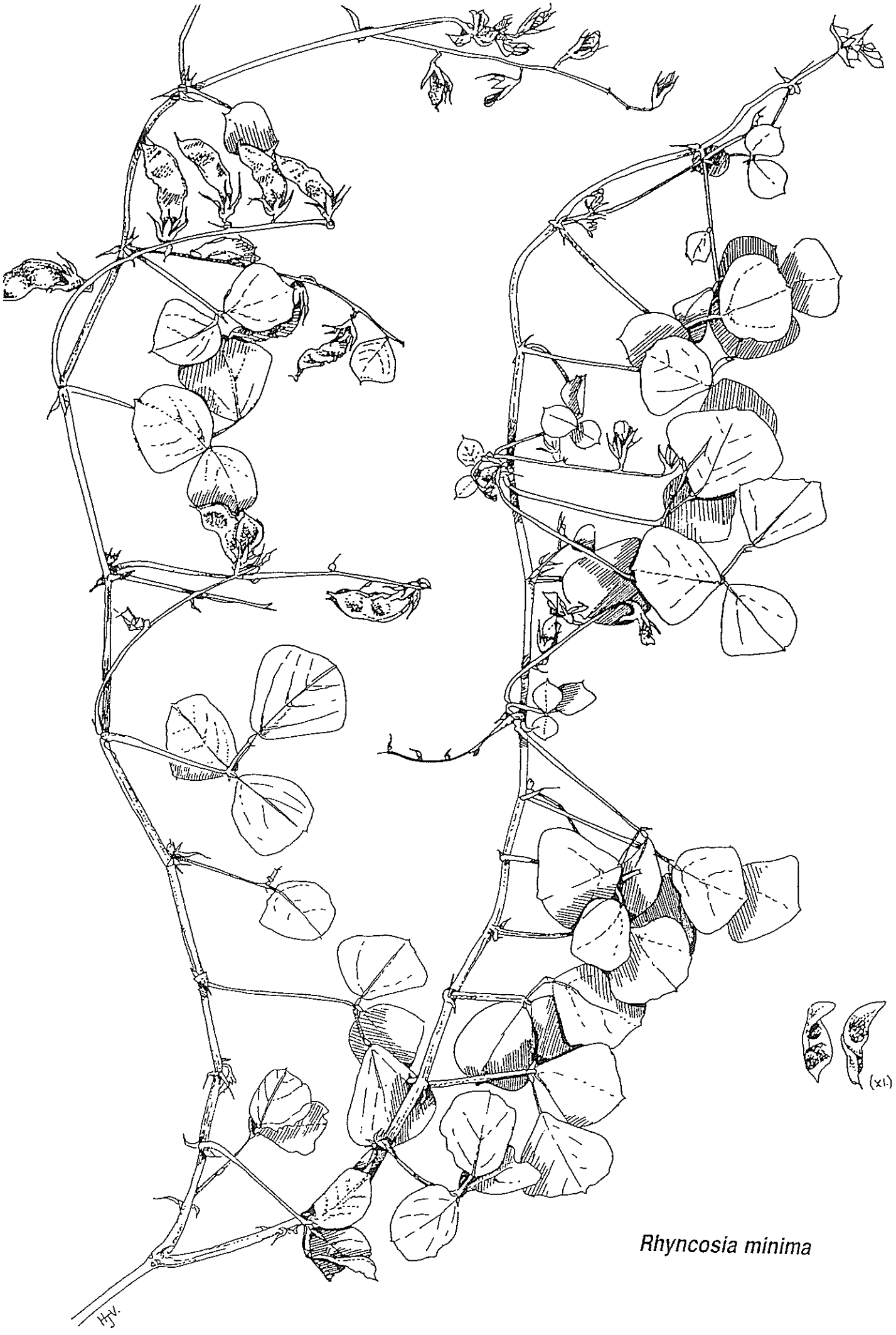
Habitats and Distribution:
Growing over a wide variety of lands, but most prefers the medium textured (loamy) and calcareous soils. Often found on alluvial plains.

Grazing Value and Management:
Does not appear to be grazed by cattle. It may behave as an increaser species if competition from grasses is reduced.



Nutritional Information:
None available.

Further Information: 20, 24, 32



Rhyncosia minima

Native Pea

Rhyncosia

Botanical name: *Rhyncosia minima*

Description:

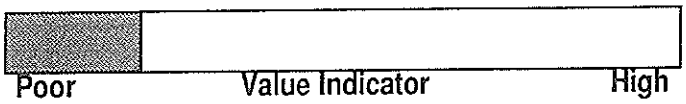
A twining or prostrate perennial herb with stems sometimes exceeding 1.0m long. Leaf petioles to 40mm long with three leaflets densely dotted with brown resin glands on the undersurface. Leaflet is as broad (broadest at mid point) as long in a softly square shape, with fine hairs. Inflorescence is an erect multi-flowered stalk to 10cm long, arising from the leaf axils. The flowers are small and yellow. Pods often have resin glands on the outside, and contain two roughly kidney-shaped seeds.

Habitats and Distribution:

A widespread and variable species, it is found on loam to clay textured soils, but does not tolerate heavy flooding.

Grazing Value and Management:

It is a somewhat palatable species, particularly when young. However it is generally not actively selected for by stock.



Nutritional Information:

The leguminous nature of Rhyncosia indicates a reasonable nutritive value.

Ref: D.Wilson, pers.comm.	Wet Season	Dry Season
Digestibility %	69.0	33.0
Crude Protein %	18.8	4.4
Phosphorus %	0.23	0.04

Further Information: 18, 20

Sida acuta

Sida rhombifolia

Sida

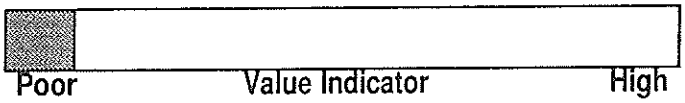
Botanical name: *Sida acuta* - Spinyhead Sida
Sida rhombifolia - Paddy's Lucerne/Sida Retusa

Colour Plate: Page 84

Description:
Erect annuals or perennials with woody branched stems and a strong tap root, usually up to 1.0m tall. Alternate leaves are lance shaped (tapering at both ends) with serrated margins. Flowers are yellow to pale yellow, usually solitary or growing in pairs at the leaf axils. Seed capsules divide into 5-8 portions, each of which have two sharp points at one end.

Habitats and Distribution:
A native of Central America, Spinyhead Sida is widespread in the higher rainfall areas of tropical Australia. It is a strong competitor and grows over a wide range of soil types.

Grazing Value and Management:
Unpalatable, the sidas are not readily grazed by livestock, however grazing will occur when other feed is scarce. This, along with their strong competitive nature, has seen Spinyhead Sida and Sida retusa designated noxious weeds in the Northern Territory; Class B (spread to be controlled) and Class C (introduction to be prevented). Sida retusa is grown in India for the manufacture of high quality hemp from the stems.



Nutritional Information:
None available.

Further Information: 21, 29, 32, 33, 34

Sida spinosa

Sida fibulifera

Native Sida

Botanical name: *Sida fibulifera* - Pin Sida, Silver Sida
Sida spinosa - Spiny Sida

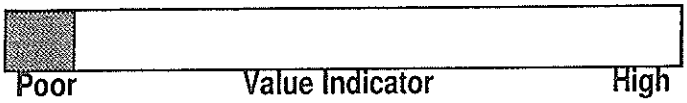
Description:
Annual or perennial herbs or subshrubs to 1m high.

Pin Sida - leaves are 6-35 x 3-15mm, ovate to oblong, hairy on both sides. Flowers are yellow. Pods are depressed and ovoid, with 5 - 8 segments.

Spiny Sida - leaves are 6-20 x 2-9mm, ovate to oblong, hairy on both sides. Flowers are yellow. Pods are onion shaped, with 5 segments, each segment having two erect spines on it.

Habitats and Distribution:
Sida species will grow over a wide variety of habitats. They are common weeds of degraded land and cultivated areas.

Grazing Value and Management:
They are unpalatable and not usually grazed by livestock.



Nutritional Information:
None available.

Further Information: 21, 32, 48

Stylosanthes hamata

Verano Stylo
Caribbean Stylo

Botanical name: *Stylosanthes hamata* cv Verano

Description:
Verano is a spreading to erect, short lived perennial to 1.0m tall, though often growing as an annual in the Northern Territory. It is a relative of the annual Townsville Stylo (*Stylosanthes humilis*) or Townsvill Lucerne as it is known. Townsville Stylo spread over large areas of northern Australia until it was devastated by the fungal disease Anthrasnose in 1973.

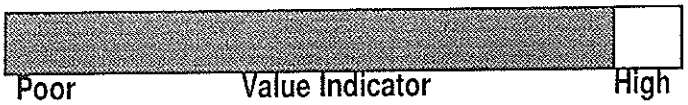
Verano can be distuinguished from Townsville Stylo by smooth stems with a fine line of white hairs running along one side. Leaves are trifoliate with spear-shaped leaflets up to 25mm long and 7mm wide. Leaflets broadest around mid point. The flowering head is terminal and dense. Flowers are usually hidden by overlapping bracts until pollination. Pod containing 1-2 seeds is 5mm. long plus a curved beak of similar length, and is densely covered in short hairs.

Townsville Stylo has conspicuous bristles around the base of the leaf stalks and on the seed head.

Habitats and Distribution:
Introduced from South America, it is now naturalised in parts of the N.T. It grows well in 500-600mm. rainfall or higher. Occurring on a variety of soil types (sandy to clay-loam), it is however absent from the heavy black soils. Verano is tolerant of low soil phosphorus levels.

Grazing Value and Management:
Mostly regenerating from seed each year, adequate seed set is an important factor in maintaining stand viability. Verano pastures should be spelled or at least only grazed lightly at this stage to permit seed bank build-up.

A very palatable species, it is a valuable, productive plant particularly useful as a component of mixed grass/legume improved pastures.

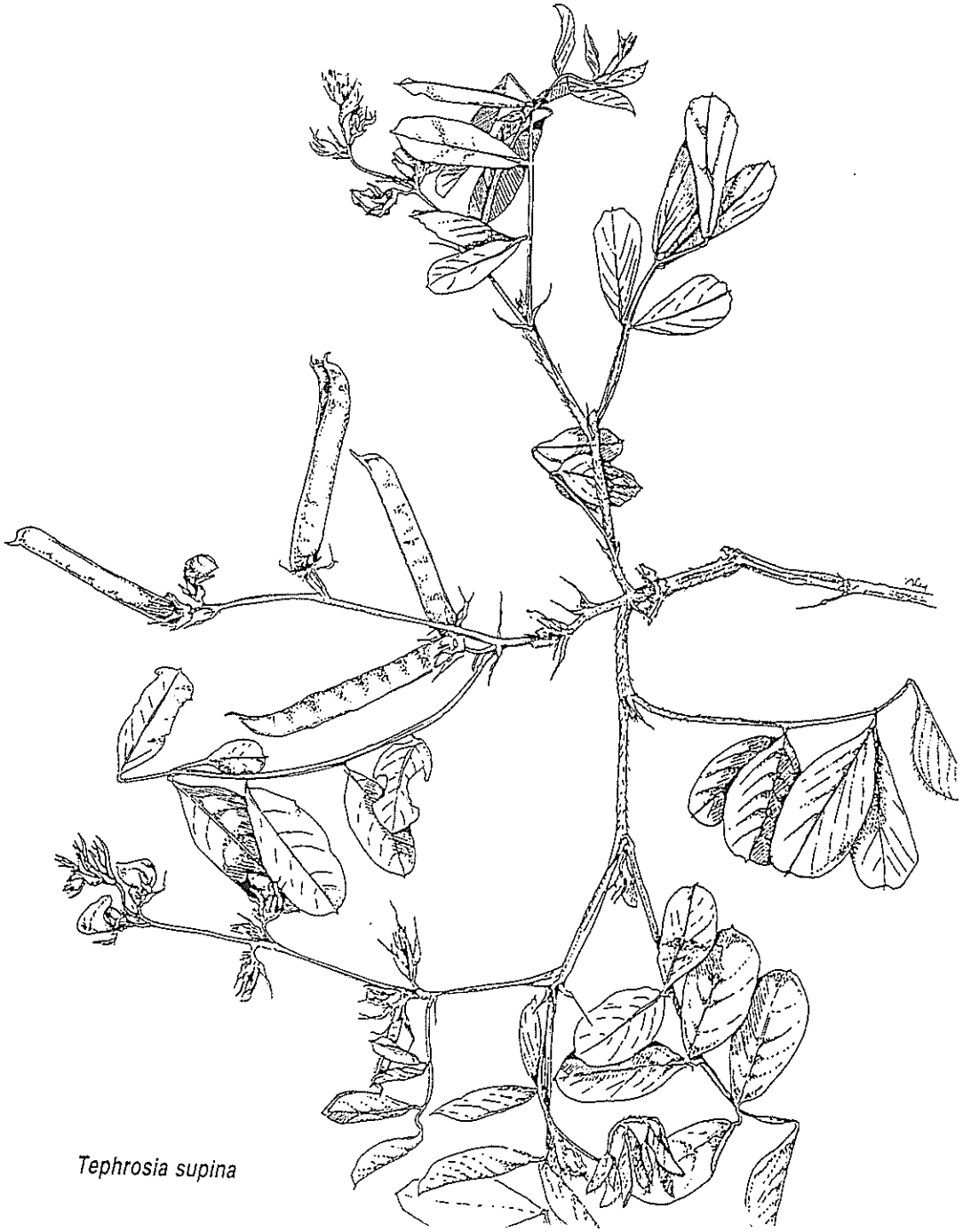


Nutritional Information:
A nutritious plant during the growing season, and while feed value declines, it is still a valuable and palatable source of nutrition during the dry season.

	Wet Season	Dry Season
Digestibility %	67.0	49.0
Crude Protein %	17.0	8.9
Phosphorus %	0.14	0.07

Further Information: 4, 44

Tephrosia rosea



Tephrosia supina

Flinders River Poison

Botanical name: *Tephrosia rosea*

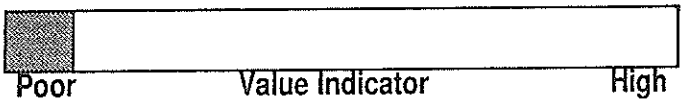
Colour Plate: Page 83

Description:
A bushy, ascending perennial shrub 50cm, sometimes to 1.0m high with stems densely covered in short white hairs. Leaves consist of 5-7 wedge-shaped, grey-green leaflets that are broadest past the mid point. Fine hairs, more dense on the lower leaf surface, give the plant a silvery-grey appearance. Inflorescence is a long, rigid, terminal stalk with spaced clusters of purple flowers with a white base and hairs on the back. Pods are narrow, to 30mm. long and characteristically upturned towards the tip. The pod contains 3-6 kidney-shaped light brown and black seeds.

A similar species *Tephrosia supina* also occurs on VRRS.

Habitats and Distribution:
Widespread, it may grow in dense localised stands. In drier areas it is an occupant of hillsides and valleys.

Grazing Value and Management:
An unpalatable species, it is not of grazing significance. Despite its common name, there is no evidence of toxicity to livestock.



Nutritional Information:
None available.

Further Information: 18, 20, 32

Trichodesma zeylanicum

Camel Bush

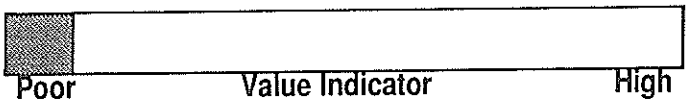
Botanical name: *Trichodesma zeylanicum*

Colour Plate: Page 83

Description:
An erect to spreading, slender herb to 0.5m tall, with hairy stems arising from a perennial base. Grey-green, hairy leaves are usually narrow, coarse, with curled margins and may be opposite or alternate on stems. Terminal flowers are pale blue, bell-shaped and hairy, and tend to hang. The fruit is a hairy, pointed, papery capsule containing single-seeded nuts.

Habitats and Distribution:
Grows on a wide variety of soil types in open woodland to savanna to grassland plains. Occurring in low to medium rainfall areas, it is a coloniser of degraded pastures.

Grazing Value and Management:
Of no grazing value, Camel Bush has been suspected of being potentially toxic to stock. It is an increaser species.



Nutritional Information:

	Wet Season	Dry Season
Digestibility %	39.0	
Crude Protein %	11.0	
Phosphorus %	0.36 n=3	

Further Information: 3, 10, 20, 32

Plate 35: Wild Passionfruit (*Passiflora foetida*)

Plate 36: Sesbania (*Sesbania cannabina*)

Plate 37: Camel Bush (*Trichodesma zeylanicum*)

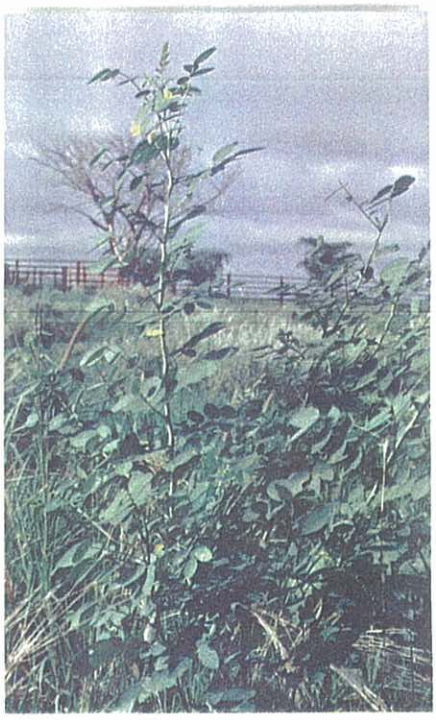


Plate 38: *Cassia* species

Plate 39: Flinders River Poison (*Tephrosia rosea*)

Plate 40: Tall Mulla Mulla (*Ptilotus exaltatus*)

Plate 41: Yellow Hibiscus (*Hibiscus panduriformis*)

Plate 42: New Holland Rattlepod (*Crotalaria novae-hollandiae*)

Plate 43: Spinyhead Sida (*Sida acuta*)

Plate 44: Tickweed (*Cleome viscosa*)

Plate 45: Kapok Bush (*Aerva javanica*)

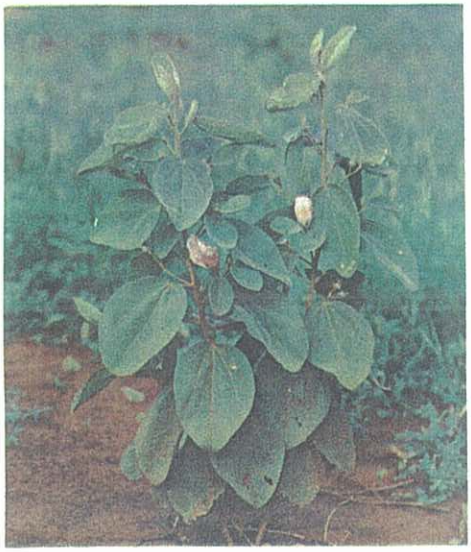


Plate 46: Wild Cotton (*Gossypium australe*)

Plate 47: Sensitive Plant (*Neptunia dimorphantha*)

PART 3

Shrub Species

Calotropis procera

Rubber Bush

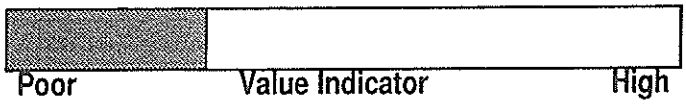
Calotrope, Indian Milkweed

Botanical name: *Calotropis procera*

Description:
A many branched shrub or small tree growing to 4m tall, though seldom above 3m. Leaf pairs opposite on stem; broad, fleshy, and heart-shaped, which bleed copious amounts of a white latex sap if damaged. Flowers white and purple, evident much of the year. Fruit is large, swollen, and filled with spongy seed-containing tissue.

Habitats and Distribution:
Naturalised from Asia and Africa, it now occurs widely across northern Australia. Prefers sandy alluvial soils along waterways, but will be found on a wide range of soil types. Has a habit of forming dense thickets on fertile soil. Invades cultivated or overgrazed lands where competition from grasses is minimal. Evidence suggests that populations decline naturally after the initial infestation.

Grazing Value and Management:
Cattle will eat the leaves if hungry but palatability is not high. Significant quantities in the diet do not appear to have any adverse effect upon health or production. Rubberbush provides digestible bulk, relatively high in protein and phosphorus.



Calotropis procera is a Class B noxious weed (spread to be controlled) in the Territory below 16 30', i.e. south of a line through the station homesteads of Rosewood, Amanbidgi, Victoria River Downs, and Birrimba. It is also a Class C noxious weed (not to be introduced) for the whole Territory.

Efficient control is difficult. Waxy leaves obstruct chemical control, while fire and mechanical destruction of aerial portion is not effective due to the plants strong regenerative ability. Eradication requires grazing management to promote competitive grass growth.

Nutritional Information:
Contains human cardiac poison, calotropin.

** LEAVES ONLY **	Wet Season	Dry Season
Digestibility %	79.0	
Crude Protein %	15.5	
Phosphorus %	0.17	

Further Information: 1, 10, 19, 21, 23, 29, 32, 36

Carissa lanceolata

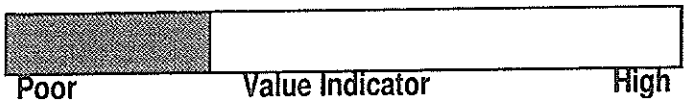
Conkerberry

Botanical name: *Carissa lanceolata*

Description:
A dense shrub up to 3m high. Dark-green leathery leaves opposite on branches, with two sharp spines at the leaf base. Small, fragrant white flowers during wet season. The fruit is an ovoid and fleshy, red berry which turns blackish and becomes edible as it matures.

Habitats and Distribution:
Occurs on clay soil margins and calcareous sandy - sandy loam earths. May form thickets and hinder management. It is common on grey clays of the Northern V.R.D and the Sturt Plateau.

Grazing Value and Management:
Only moderately palatable to stock, it is sometimes regarded as a browse species. While it is fire and drought tolerant, overgrazing Conkerberry may kill the plant due to the new shoots continually being removed. Fire should be used to keep it in balance. The foliage becomes increasingly less digestible with age.



Nutritional Information:
Low nutritional value. Highest value in the pre-wet period when it is producing new shoots, and digestibility and nutritional content are at their maximums.

	Wet Season	Dry Season
Digestibility %	43.0	45.0
Crude Protein %	9.7	8.8
Phosphorus %	0.12	0.14

Further Information: 1, 11, 20, 32, 46

Dichrostachys spicata

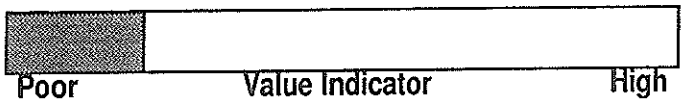
Chinese Lantern

Botanical name: *Dichrostachys spicata*

Description:
A woody perennial shrub or small tree growing to 3-4m tall, sometimes forming thickets. Young stems are densely covered with fine hairs. Lateral branches end in a single sharp spine. Leaves are bipinnate (complex fern-like). Showy yellow and pink flowers form a cylindrical spike. The flat pods are 40mm long, brown and twisted, containing dark brown oval seeds. It nodulates, fixing nitrogen in the soil. It is often mistaken for Needle Bush (*Acacia farnesiana*), which has double spines.

Habitats and Distribution:
In association with Needle Bush, on overgrazed areas, particularly along watercourses and heavy textured soils.

Grazing Value and Management:
A useful legume bush whose pods and leaves are palatable to grazing livestock, but can form thickets and cause mustering difficulties.



Nutritional Information:
Little information available, but Chinese Lantern appears to have a moderate nutritional value.

Further Information: 18, 32

Lysiphyllum cunninghamii

Bauhinia

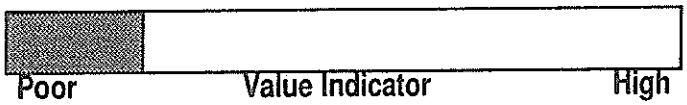
Bean Tree

Botanical name: *Lysiphyllum cunninghamii*

Description:
A medium sized spreading tree to 10m high with rough dark bark. Leaves consist of two rounded (2cm wide) blue-grey leaflets joined butterfly-like at the base. Flowers are red and tubular, grouped in the leaf axils. The fruit is a broad, flat, brittle pod containing several brown circular seeds. Flowering is during the pre-wet period. The tree is partially deciduous in times of moisture stress (the late dry, and below average years).

Habitats and Distribution:
Generally found on black cracking clays, but Bauhinia will grow over a range of soil and land types. In drier regions, it may be found in less dense stands, or singly on savanna grassland, open woodland or shrublands which have a sub-surface clay layer.

Grazing Value and Management:
Moderately palatable to browsing stock, it is drought resistant and tolerates heavy grazing. Stock have been known to consume both green and fallen leaf during the late dry.



Nutritional Information:
The leaves and pods contain moderate levels of protein and minerals. Some data gives very high levels of phosphorus (over 0.3%) but this is inconsistent. Leaf litter has been measured at 6.3% Crude Protein, 0.05% Phosphorus and 43% Digestibility.

	Wet Season	Dry Season
Digestibility %	40.0	40.0
Crude Protein %	13.1	12.9
Phosphorus %	0.13	0.14

Further Information: 1, 3, 11, 32, 46

Sesbania cannabina

Sesbania Pea

Pea Bush

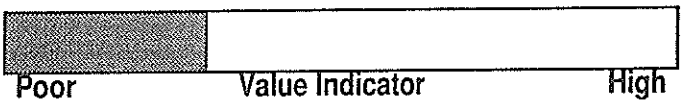
Botanical name: *Sesbania cannabina*

Colour Plate: Page 83

Description:
A tall, slender, annual shrub to 3m tall. Long pinnate leaves have many leaflet pairs (often 30 or more). The oblong leaflets have a rounded apex and minutely pointed tip. 1cm long pea-shaped flowers flecked with purple on the back, are on short stalks in the leaf axils. Long (15-20cm) straight pods are slender and contain many rounded, dark brown seeds.

Habitats and Distribution:
Grows on heavy soils, waterlogged areas, low lying wet areas, and roadsides. It is tolerant of saline and alkaline soils. Appears to be more prominent in wetter conditions.

Grazing Value and Management:
Grazed as a young plant, it loses palatability as it matures and thus may behave as an increaser species on black soils that have been heavily grazed the previous season. The seeds and pods are sometimes selected for when close to maturity.



Nutritional Information:
Provides nutritious feed when grazed.

Ref: D.Wilson, pers.comm.	Wet Season	Dry Season
Digestibility %	52.0	38.0
Crude Protein %	20.0	7.8
Phosphorus %	0.29	0.07

Further Information: 4, 18, 21, 32

Terminalia oblongata ssp *volucris*

Terminalia bursarina

Rosewood

Botanical name: *Terminalia oblongata* ssp *volucris*

Description:
A small tree growing to 8m high though grazing tends to restrict height to less than half this. Bark is finely grooved. Deciduous during the dry, new leaves appear with flowering. Leaves arranged spirally along branches, and are broad, rounded at the apex and taper towards the petiole. The flowers are small white clusters appearing before the new leaves. Fruit is a two winged nut 5cm across and 3cm deep.

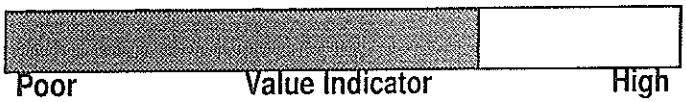
Another species, Bendee, (*Terminalia bursarina*) also is found on VRRS, but this has no grazing value.

Habitats and Distribution:
Rosewood grows on black soil plains and seasonally wet areas on heavy soil types. May occur on lighter soils provided it has abundant moisture *e.g.* along watercourse margins. Often associated with Bauhinia (*Lysiphyllum cunninghammi*).

Grazing Value and Management:
The young shoots are particularly palatable, and thus it is highly regarded for its browse value when the new leaves appear in the pre-wet, a time when pasture feed is sparse and of low value.

There are some reports of oxalate poisoning of stock, but this is not known in the V.R.D.

It can become a management problem if density is not controlled through the use of fire.



Nutritional Information:
Rosewood has a moderate nutritional value. It is probably the best browse species available.

	Wet Season	Dry Season
Digestibility %	56.0	53.0
Crude Protein %	14.8	13.7
Phosphorus %	0.18	0.16

Further Information: 1, 32, 46

COMMON NAME INDEX

SCIENTIFIC NAME INDEX

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