

# Other herbaceous plants

## Pasture and herbfield

F

Sown pastures are made up almost entirely of exotic grasses and legumes and now cover about 5% of the continent. They are a new structural form of vegetation in this country. The nearest natural equivalents to sown pastures are the denser herbfields, forms occurring over very limited areas or existing only fleetingly as part of a herbaceous vegetation flush after rain.

In these mixtures of grasses and forbs many of the introduced grasses are sward-forming by nature and the tussocky species are kept short by grazing. The structure is therefore generally that of a low herbaceous sward. Sown pastures are maintained by repeated fertilizer applications, and those in the **F3** (30–70% cover) category often alternate with seasonal crops and

thus may be largely annual, either being planted or appearing voluntarily.

Dense sown pasture (**F4**) and sown pasture (**F3**) appear only on the Present Vegetation map. Open herbfield (**F2**) is not shown on either map, but does occur during seasonal changes in sparse open herbfield (**F1**).

### Dense sown pasture

>70% foliage cover

F4

As there is no entirely appropriate term for this vegetation type in the terminology of Specht (1970), 'dense sown pasture' is proposed because of the predominance of sown exotic sward-forming grasses and legumes. However, volunteer exotic grasses, legumes and other forbs also occur within this vegetation form and even some native

grasses, such as *Bothriochloa macra*, that can adopt the sward-forming habit under grazing.

Although most of the sown exotic grasses are grazed to low sward swards, some species (such as *Cenchrus ciliaris*) remain tussocky or tufted and therefore coded as grasslands (**yG3**, **yG4**).

Many of the mapped areas of dense sown pasture in eastern Australia (**yff4**, **yF4**) are dominated by perennial plants. They extend from northern Qld to Tas., mostly on land that was formerly covered by forest or woodland. Relic trees are a feature of many of these landscapes. In other areas natural vegetation has been entirely removed. Dense sown pasture occurs largely in coastal or near-coastal locations where the dense cover is maintained by regular rainfall, but there are also examples further inland—in the irrigation areas of southern NSW and northern Vic.

The number of introduced pasture species is large and growing. In order of increasing temperature requirement, important grasses are *Lolium perenne*, *Paspalum dilatatum*, *Pennisetum clandestinum*, *Digitaria decumbens* and species of *Brachiaria*; the legumes include *Trifolium repens* (and some seasonal *T. subterraneum*), *Neonotonia wightii*, species of *Desmodium*, and *Centrosema pubescens*. *Medicago sativa* is prominent in some temperate regions and is the dominant species of the irrigated pastures (**fyF4**) in the lower Hunter Valley.

The dense pastures are generally grazed by dairy or beef cattle, with some sheep in the south. In some of the mapped areas seasonal cropping is alternated with livestock grazing, although this occurs primarily with the following type (**F3**). The principal winter crops are wheat (*Triticum* cultivars), barley (*Hordeum* cultivars) and oats (*Avena* cultivars). The summer crops include grain sorghum (*Sorghum bicolor*) and peanut (*Arachis hypogaea*) in the north, and rice (*Oryza sativa*) in the irrigation areas of NSW.

In the south-west of WA, under a highly seasonal rainfall pattern of wet winters and dry summers, the dense sown pastures are dominated by seasonal species (**yff4**). The characteristic species are *Lolium rigidum* and *Trifolium subterraneum*, though there is also a range of seasonal exotic volunteer grasses including species of *Bromus*, *Hordeum* and *Vulpia*, and legumes such as *Trifolium*.

The native bracken fern (*Pteridium esculentum*) occurs as a weed in many areas of dense seasonal and perennial sown pasture.

## PASTURES

The map shows the major areas where introduced grass and legume pastures have been established to support livestock industries. Most of these exotic species are sown but, once established, many are

self-generating. The pastures may be either seasonal or perennial.

Across southern Australia, most of the introduced pastures are grazed to a low sward and are structurally

classed as **F3** or **F4**. The photo at right shows seasonal pasture (**yff3**) and crops near Cowra (NSW) and that below is a dense sown pasture (**yff4**) in west Gippsland (Vic.). Many introduced pastures

in the north, however, are made up of tussocky or tufted grasses, which do not form a sward under grazing and are coded as **G3** or **G4**.

The maintenance of many of the intro-

duced pastures is dependent upon artificial fertiliser and, on current rates of application, over 1 million tons of superphosphate are used on about 100 000 km<sup>2</sup> of pasture in Australia annually.



F

**Sown pasture**

30–70% foliage cover

F3

Sown pasture is similar to dense sown pasture, but in general is found in areas of lower rainfall or less fertile soils. Most of the sown pasture areas in the south-east and south-west of the continent lie within the major cereal cropping regions and are frequently of seasonal occurrence. Relic trees and shrubs are a feature of sown pasture landscapes but there are many areas where the natural vegetation has been entirely removed.

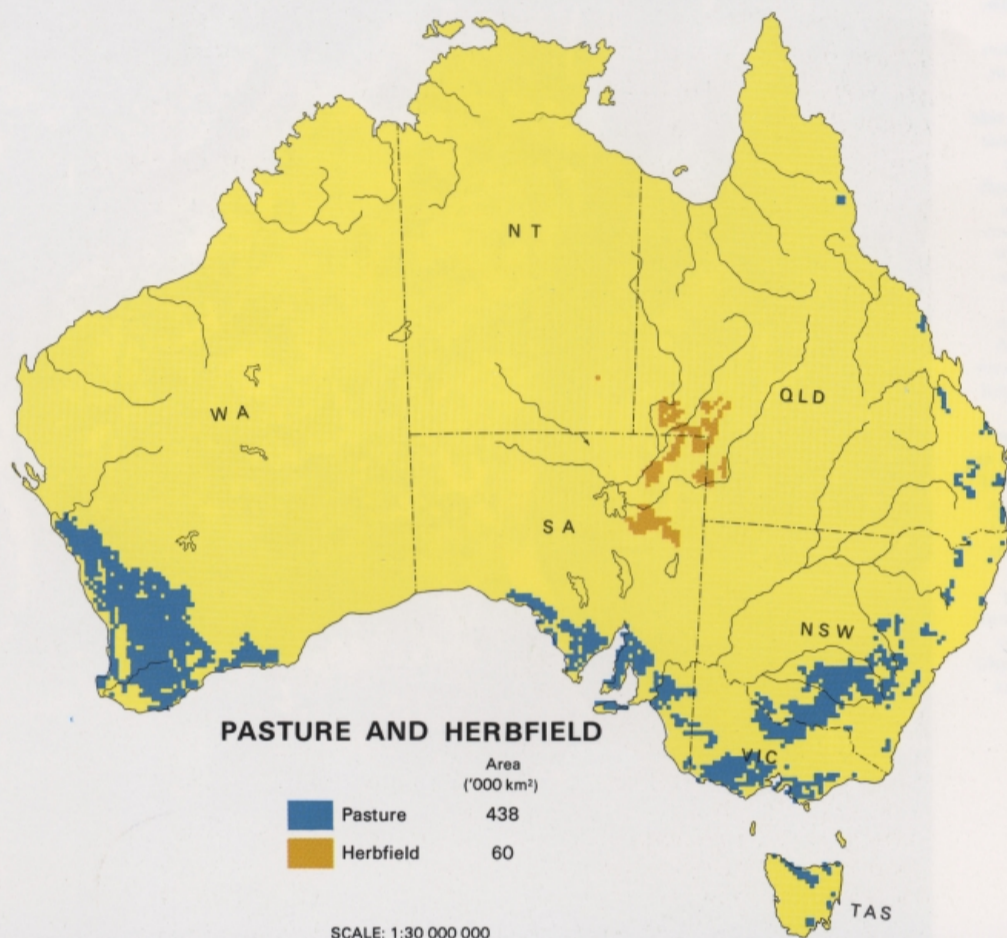
Sown pastures dominated by perennial sward-forming plants (**yF3**, **yF3**) occur principally in south-eastern Australia on lands formerly occupied by forest, woodland and to a lesser extent by shrubland or tussock grassland. The characteristic species include the grasses *Lolium perenne* and *Phalaris aquatica*, and the legumes *Trifolium repens* and the seasonal *T. subterraneum*. A range of other exotic species, both sown and volunteer, is found in these pastures and also some native grasses, such as *Botriochloa macra*.

Much larger areas of sown pasture, generally under lower or more strongly seasonal rainfall patterns, are dominated by seasonal plants (**yF3**, **yF3**). Where these pastures occur in south-eastern and south-western Australia, they are on land formerly occupied by woodland, tall

shrubland and open scrub. Over much of their mapped area, there is a marked winter rainfall maximum which favours cool season plants.

Livestock grazing, alternating in many areas with seasonal cropping, is the principal land use and the landscape often appears as a mosaic of crop and pasture paddocks. The principal winter cereal crop is wheat (*Triticum* cultivars), though barley (*Hordeum* cultivars) and oats (*Avena* cultivars) are also widespread. Lupins (*Lupinus* cultivars) are prominent in some places, notably north of Perth.

The principal sown legumes of the seasonal pastures are *Trifolium subterraneum* in better-watered areas, and species of *Medicago* under lower rainfalls. The grass *Lolium rigidum* is sown in some areas. There is also a range of volunteer exotics which may form a large proportion of the pasture. These include species of grasses from genera such as *Hordeum*, *Avena*, *Bromus* and *Vulpia* and the legume genera *Trifolium* and *Medicago* as well as other forbs such as the widespread weeds *Arctotheca calendula* and *Echium plantagineum* and members of the family Brassicaceae. Areas mapped as occupied by this vegetation type may include lesser areas of native tussock grassland.

**Sparse open herbfield**

&lt;10% foliage cover

F1

The name 'sparse open herbfield' is based on the terminology of Specht (1970) but was not used by him. Most of the mapped examples of this structural form are dominated by herbaceous members of the Chenopodiaceae (**kF1**). In general they occur naturally, although two examples shown in the western Simpson Desert on the Present Vegetation map appear to result from grazing on former low open shrubland (**kZ1yG**).

Sparse open herbfield occurs mainly in areas with less than 200 mm annual rainfall along the eastern margin of the Simpson Desert in Qld and south to Lake Frome (SA), where it is characteristic of duplex soils with dense mantles of stones ('gibbers'). Some gibber plains are overlain by widely spaced sand dunes.

The most common forbs are species of *Atriplex* and *Sclerolaena*, including *A. spongiosa*, *S. divaricata*, *S. eriakantha* and *S. lanicuspis*. Other species may be present, notably members of the Asteraceae. Vegetative cover and composition fluctuate greatly with seasonal conditions. In dry years virtually all vegetation disappears, while after rain it may thicken to open

herbfield density, either with the chenopods still dominant (**kF2**) or with a wide range of genera (**xF2**).

Tussock grasses such as *Astrelba* may also become prominent in wet years, more particularly in areas not covered by gibbers. However, chenopod forbs are the most persistent elements and the vegetation of the desolate gibber country is therefore generalised as sparse open herbfield (**kF1**). An area of sparse open herbfield south-east of Lake Eyre is bordered by clay flats associated with a chain of saline ephemeral lakes. The vegetation of these flats is similar to that of the gibber country but is characterised by a range of floristic elements (**xF1**).

Settlement of these areas took place largely during the 1880s and a succession of good seasons created an over-optimistic view of the carrying capacity of this country. In subsequent years many holdings were abandoned along its drier margins. While much of this area is still part of functioning cattle properties, it is only lightly grazed and the adjacent Channel Country is the main source of stock feed.

**Herbfield vegetation on gibber plains**

This vegetation type is often little more than a scatter of dried out forbs and grasses for months, and sometimes years, at a time. But after big rains the same landscape may carry a denser cover of forbs and grasses (above). Both the amount of ground cover and the floristic composition fluctuate widely with seasonal conditions, but the gibber plains are more commonly in the desiccated state, shown in the photo at left, with persistent forbs of the genus *Sclerolaena* (**kF1**) as the only ground cover.