**APPENDIX 2 – GENERAL BACKGROUND NOTES ON PASTURE SPECIES SELECTED FOR TRIAL WORK**

**Grasses**

**Annual Ryegrass** (A)

There are a few Annual ryegrass (*Lolium spp)* cultivars available, including short growing season other than Wimmera. Some varieties are ARGT free, which is the potential issue with Wimmera.

Varieties sown in the trials:

Fantastic

Diamond T

Wimmera

Sown at 15 kg/ha

**Brome Grass** (SL P)

*Bromus stamineus* and *Bromus willdenowii* are short-lived perennial grasses that need the plant to seed each year to ensure persistence. While they are relatives of the weedy bromes, they should not present any issues. They are probably outside their preferred environment, usually targeted in the 500 mm + rainfall areas.

Varieties sown

Nandu

Lakota

Gala

Sown at 10 kg/ha (paddock demonstration) and 20kg/ha

**Cereals** (A)

Oats, forage cereals, wheat etc may have a place as they have early maturity options available but this is not necessary if they are grown as a forage. They have a reputation as quick feed, and quicker to grazing if sown late compared with ryegrass. Most farms would have something in the silo if the opportunity to sow arose. Major issue is they have to be sown every season.

Varieties sown:

Scenario wheat

Potoroo oats

Sown at 90-100 kg/ha

**Mediterranean Fescue** (P)

Mediterranean fescue, *Festuca arundinacea*, is different to the tall fescues in that it is winter active and more drought tolerant. It is slow to establish and the district rainfall is still marginal for persistence.

Variety sown:

Resolute

Sown at 10 kg/ha in the demonstration site

**Phalaris** (P)

Phalaris, *Phalaris aquatica*, is a winter active, deep rooted grass, tolerant of waterlogging. If allowed to seed in spring, it is dormant over summer but the autumn regrowth can be toxic. Marginal rainfall and prefers the loamier soils.

Variety sown:

Australian

Sown at 5 kg/ha

**Spanish Cocksfoot** (P)

Spanish cocksfoot*, Dactylis glomerata v hispanica*, is more drought tolerant than the traditional cocksfoot. It is summer dormant but the district rainfall is still marginal for persistence.

Variety sown:

Uplands

Sown at 10 kg/ha (demonstration paddock only)

**Tall Wheat Grass** (P)

Tall wheat grass, *Thinopyrum ponticum*, is a relatively drought and salt tolerant grass, promoted in northern Victoria for revegetating saline areas. It can persist with the district annual rainfall, but dry years do see it decline. It is a summer active grass and can be slow to establish in winter. It can become rank but grazing management can reduce this and the variety Dundas was selected for finer leaves.

Variety sown:

Dundas

Sown at 15 kg/ha

**Herbs**

**Chicory** (P)

Chicory, *Cichorium intybus,* is a herb that produces highly palatable feed but requires good nutrition and rainfall higher than the district average. It is also slow growing in winter.

Variety sown

Puna II

Sown at 5 kg/ha

**Forage Brassicas** (A)

A large range exists, with differing growth habits and time to first grazing. Similar to cereals, they will need to be resown each year as they are very unlikely to persist between seasons.

Varieties sown:

Titan (forage rape)

Pasja II (leafy turnip)

Sown at 5 kg/ha

**Legumes**

**Arrowleaf Clover** (A)

Arrowleaf clover, *Trifolium vesiculosum*, is usually suited to higher rainfall areas but there are early maturing varieties available. It is hardseeded, with a vigorous root system but can be a slow winter grower. It is not tolerant of waterlogging.

Varieties sown:

Cefalu

Zulumax

Sown at 8 kg/ha

**Balansa Clover** (A)

Balansa clover, *Trifolium michelianum*, has good waterlogging tolerance and hardseededness and been available for many years. It can be slow to establish, particularly if there is a late break. Earlier maturing varieties are now available, more suitable than the older Paradanna.

Varieties sown:

Enduro

Taipan

Sown at 10 kg/ha

**Barrel Medic** (A)

Barrel medic, *Medicago truncatulata*, has been sown for many years and is more tolerant of clay soils than many of the other medics. It has good levels of hardseededness and tolerance of insects but does produce large burrs.

Variety sown:

Parragio

Sown at 10 kg/ha

**Biserrula** (A)

Biserrula, *Biserrula pelecinus*, is a very hard seeded legume, which requires hard grazing over summer to ensure sufficient softening in the second year after establishment. It is not tolerant of waterlogging, preferring the lighter acidic soils. It may also be more prone to causing photosensitisation than traditional legumes. Rainfall in the district is at the lower end of its range.

Variety sown:

Casbah

Sown at 10 kg/ha

**Bladder Clover** (A)

Bladder clover, *Trifolium spumosum*, produces high yields of hard seeds, suited to a range of soil types, as long as they are not waterlogged. It can be grown with as little as 325 mm annual rainfall.

Variety sown:

Bartolo

Sown at 10 kg/ha

**Fenugreek** (A)

Fenugreek, *Trigonella foenum-graecum*, is an early flowering legume that contains some secondary compounds in the leaves that may have beneficial effects for livestock. It is grown as a grain for the spice market.

Variety sown:

Unknown

Sown at 15 kg/ha

**Gland Clover** (A)

Gland clover, *Trifolium glanduliferum*, is a hardseeded legume reasonably tolerant of waterlogging and insects. It can be slow to establish and does contain low levels of coumarin (see the information on Melilotus). Due to the coumarin, it is not suited for hay or silage.

Variety sown:

Prima

Sown at 7 kg/ha

**Lucerne** (P)

Lucerne, *Medicago sativa*, is a well-known legume that produces quality forage and can utilise summer rainfall. It performs better on the loamier soils, as the heavier soils restrict the moisture availability and rooting depth.

Varieties sown:

Silverado (9)

Siverosa (7)

L56 (5)

Sown at 4 kg/ha

**Persian Clover** (A)

Persian clover, *Trifolium respinatum v resupinatum*, is closely related to Shaftal clover, but is a more prostrate and hard seeded clover. It is tolerant of waterlogging but is slow to establish in a late break and susceptible to insects at establishment. Early maturity varieties are available.

Varieties sown

SARDI Persian

Nitro

Sown at 8 kg/ha

**Serradella** (Pink) (A)

Serradella, *Ornithopus sativus*, is a hard seeded, quick maturing legume that prefers lighter soils. Has shown some promise as a pasture legume in NSW DPI research.

Variety sown

Margurita

Sown at 10 kg/ha

**Snail Medic** (A)

Snail medic, *Medicago scutellata*, is a quick maturing legume that has large pods liable to overgrazing.

Varieties sown:

Sava

Silver

Sown at 10 kg/ha

**Spineless Burr Medic** (A)

Spineless burr medic, *Medicago polymorpha*, is very similar to trefoil, but differs in that the spines on the burrs are greatly reduced and do not stick to the wool. It also has a higher proportion of soft seeds for better 2nd year establishment.

Variety sown:

Cavalier

Sown at 10 kg/ha

**Sub Clover** (A)

Subclover, *Trifolium subterraneum*, has many earlier maturing varieties than Trikkala or Clare available. It has a proven record as been suited to the district soils and conditions, but the traditional varieties used need irrigation to ensure seed set. Tolerant of set stocking and vigorous establishment.

Varieties sown

Dalkieth

Dalsa

Sown at 10 kg/ha

**Sulla** (SL P)

Sulla, *Hedysarum coronarium* is a short-lived perennial/biennial legume that has the potential for high levels of forage production but may struggle with the district annual rainfall. It is not tolerant of waterlogging and is hardseeded.

Variety sown:

Wilpena

Sow at 20 kg/ha

**Rose Clover** (A)

Rose clover, *Trifolium hirtum*, is suited to a wide range of soils especially lighter textured soils. It is sensitive to heavy grazing or cutting. Will persist under lower rainfall than subclover but still marginal. Seed heads can contaminate fleeces.

Variety sown:

Hykon?

Sown at 8 kg/ha

**Small Plot Species**

**Austral Trefoil**

The Austral Trefoil, *Lotus australis*, is a perennial herbaceous legume with a growth habit quite similar to cultivated lucerne. It is not directly related to the medic commonly referred to as Trefoil. In some parts of New South Wales it's called Barwon Lucerne. Like lucerne, a woody crown helps it survive harsh periods of drought or winter cold when the above-ground parts die back. Its leaves are soft and lucerne-like also, but can be easily distinguished from lucerne by its leaves having two other leaflets at the base of the leaf-stalk, quite different from the small, transparent stipules at the base of a lucerne leaf. And unlike the small, purple flowers of lucerne, Austral Trefoil flowers are large and usually white to shell-pink.

**Foxtail restharrow**

*Ononis alopecuroides* L. (Fabaceae) is a heavily branched woody annual 0.5-1 m in height. The lower plant stems are glabrous while the upper stems are glandular and hairy. Young seedlings often have unifoliate leaves. Leaves on mature plants are trifoliate with the lateral leaflets reduced in size compared to the terminal leaflet. The leaflets are edged with tiny teeth and are elliptical or elliptic-orbicular in shape. The flowers are borne singly at each node, and form dense terminal spikes. The corolla (13-16 mm wide) is pink and is as long as (or longer than) the tubular calyx. The seed-pod is 8-10 mm in length and contains 2-3 seeds. Each seed is 2-3 mm long, orange-brown, smooth and shiny. *Ononis alopecuroides* is native to the western Mediterranean region, northern Africa, and southern Europe.

*O. alopecuroides* grows best in moist areas receiving full sun. Sunny, dry areas tend to have smaller plants (0.3 m compared to 1.5 m tall and 1.5 m wide). Plants are not found in shady areas, even if the soil is moist. O*nonis alopecuroides* is occasionally weedy in northern and central Europe. However the plant has been assessed by Biosecurity Australia. The outcome is that Ononis is classified as non threatening and permitted to be grown.

**Running Postman**

Kennedia prostrata, commonly known as Running Postman or Scarlet Runner, is a species of [flowering plant](http://en.wikipedia.org/wiki/Flowering_plant) in the family [Fabaceae](http://en.wikipedia.org/wiki/Fabaceae), endemic to [Australia](http://en.wikipedia.org/wiki/Australia).

It is a prostrate or twining perennial shrub which can spread to a width of 1.5 metres and has light green leaves that comprise 3 rounded leaflets with undulating edges. Scarlet pea flowers are produced singly or in pairs between April and November in its native range. These are followed by cylindrical pods that are 3 to 5 cm in length.

It is native to the states of [Western Australia](http://en.wikipedia.org/wiki/Western_Australia), [South Australia](http://en.wikipedia.org/wiki/South_Australia), [Tasmania](http://en.wikipedia.org/wiki/Tasmania), [Victoria](http://en.wikipedia.org/wiki/Victoria_%28Australia%29) and [New South Wales](http://en.wikipedia.org/wiki/New_South_Wales).[[](http://en.wikipedia.org/wiki/Kennedia_prostrata#cite_note-NSW-3)

**Sabel Trigonella**

Australian pasture evaluation programs have been examining a wide range of pasture genera for their ability to complement and add diversity to the medic pasture base. The genus *Trigonella* has been identified as having potential in Australian farming systems. *Trigonella balansae* is an annual legume of Eurasian origins and has shown promise in more recent trials. It is both productive and able to regenerate on alkaline soils receiving <400mm annual rainfall. Its upright growth habit and proliferation of seedpods at the top of the canopy make it amenable to low cost seed production.

**Southern milkvetch**

Astragalus hamosus is an annual legume growing to 0.6 m by 0.5 m. It is in flower (in the Northern Hemisphere) from May to July, and the seeds ripen from July to September.

Suitable for well-drained, light to medium soils and full sun. It is tolerant of a range of soil pH.

**Sweet Clovers**

*Melilotus elegans, Melilotus siculus*

Melilotus, known as Sweet-clover, is a genus in the family [Fabaceae](http://en.wikipedia.org/wiki/Fabaceae). Originally from Europe and Asia, it is now found worldwide. Similar to Ononis, the genus has a reputation for weediness and has undergone similar weediness assessment and also investigated using weed risk assessment criteria established within the FFI CRC. It has been determined that these Melilotus are permitted to be grown.

The Melilotus sown in the trial are selections of M. siculus and M. elegans that do not contain coumarins, unlike the two common melilotus found in the district.

This legume is commonly named for its sweet smell, which is due to its high content of the perfume agent [coumarin](http://en.wikipedia.org/wiki/Coumarin). This chemical is responsible for the sweet smell of hay and is bitter to the taste, probably produced by the plant to discourage ingestion by animals.[[2]](http://en.wikipedia.org/wiki/Melilotus#cite_note-2) Coumarin, in turn, is converted by fungi into a poisonous anticoagulant, called [dicoumarol](http://en.wikipedia.org/wiki/Dicoumarol) that may be found in moldly or spoiled sweet-clover. This compound was the historical cause of so-called sweet-clover disease, recognized in cattle since the 1920s. It is a relative of two local weeds, Bokhara or white sweet clover (a perennial you might have seen on channel banks with small white flowers) and Hexham scent (an annual winter weed that looks a bit like lucerne but with yellow flowers). Both these have the coumarin that gives them their distinctive smell and is known to taint milk.

**Wallaby Grass**

*Austrodanthonia caespitose* is a common native perennial grass in the district. It is predominantly a winter growing grass.