



1990

## The role of perennial pasture species for increasing sheep production in the medium rainfall zone of W.A.

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1990 EXPERIMENTAL SUMMARY

TRIALS : 90ÄL33, 90ÄL34, 90ES56, 90ES57, 90KAIOO

TITLE : The role of perennial pasture species for increasing sheep production in the medium rainfall zone of W. A.

AIM: To examine the productivity and persistence of perennial grasses in the 350-800 mm rainfall zone of W. A.

TRIAL SITES:

i) Green Range - annual rainfall = 600 mm

a) 90 AL33 - midslope landscape site.

Soil type: gravelly sand  
0.5m gravelly clay .

pH (water) : 5.7 - 5.8

Paddock history: 1988 - Oats + 100 kg/ ha superphosphate  
1989 - lupins + 100 kg/ ha superphosphate

b) 90ÄL34 - flat site at base of hill

Soil type: sandy loam prone to  
waterlogging

pH (water) : 5.8 - 6.0

Paddock history: 1988 - oats + 100 kg/ ha superphosphate  
1989 - lupins + 100 kg/ ha superphosphate.

**ii)** Esperance annual rainfall = 450 mm with increased incidence of summer rainfall.

a) 90ES56

Soil type : deep 'banksia' grey sand 1  
metre to gravelly sand well  
drained/water repellent

pH (water) : 5.7 - 5.8

Paddock history : 1988 - pasture topdressed with  
110kg/ha superphosphate .  
1989 - wheat plus 160 kg/ ha Agras 1  
1990 - topdressed with 130 kg/ ha  
superphosphate (March) .

b) 90ES57

Soil type: shallow 'chittick' grey sand 0.5 metre  
to gravelly clay tends to be 'very wet'  
' /water repellent

pH (water) ; 5.7 - 5.8

Paddock history: 1988 barley + 60 kg/ha D.A. P.  
1989 pasture + 110 kg/ ha  
superphosphate

i i i) Pingrup - annual rainfall = 350 mm

a) 90K.AIOO

Soil type : shallow grey sand  
0.5 met-re to

clay pH (water) ; 5.1 - 5.2

Paddock history: 1988 wheat + DAP/Ägran 34.0  
1989 lupins + superphosphate

SPECIES : The following lines were sown at all of the above sites.

36 commercially available perennial grass lines including: tall wheat grass, fescues, phalaris, cocksfoots, ryegrasses, brome grasses, puccinellia, lovegrass, kikuyu, veldt grasses. These lines were fully randomized and replicated three times .

13 lines of possible 'companion' legumes including lucerne, strawberry clover, sub-clover, balansa clover, berseem clover, sheep's burnett (not a legume) , serradella, lotus (latter two not sown at Green Range) .

Again these were fully randomized and replicated three times .

263 lines of 'new' and experimental perennial grass lines from interstate and overseas. These include Ägrostis spp, Alopecurus spp, Ärrenathenum spp, Bromus spp, Cynosurus cristatus, Chloris gayana, cocksfoot, fescues, phalaris, veldt grass, Italian/ perennial ryegrasses, fog grass (Holcus spp) , Poa spp and Secale montanum.

Due to the small amounts of seed supplied, these lines were randomized but unreplicated at each site. Some lines were not sown at 90ES56 and 90KÄIOO due to no seed being available.

#### SOWING TECHNIQUES:

All sites consisted of hand-sown, 2 metre x 1 metre plots.

Sowing rates : commercially recommended rates were used at all sites except Pingrup (90KÄIOO) where the commercial rates was halved.

Sowing dates : Green Range - 90AL33 - 17-18/5/90,  
9 OAL34 - 8-9/5/90  
Esperance - 90ES56 - 29-30/5/90,  
90ES56 - 28-29/5/90  
Pingrup - 11-12/6/90

Fertilizers : All lines were established with 200 kg/ ha superphosphate plus copper, zinc and molydennum.

All lines were topdress with 2 applications of nitrogen (50 kg/ ha) six weeks apart in spring. Insecticides / herbicides : Applied when required.

#### MEASUREMENTS ;

- seed viability tests.
- plant counts - 4-6 weeks after sowing, - visual assessment (scale 1-5, 1 = poor, 5 = good) of seedling vigour, winter and spring growth.
- general observations through-out the season on growth habit, disease/ insect susceptibility, flowering/ senescence (dormancy) times, extension of the green period.
- regeneration/persistence assessment. This data is currently being collected.

#### RESULTS :

Statistical analysis of the large volume of data is currently being undertaken.

Preliminary observations indicate certain lines appear to be promising at the following sites.

#### 90AL33

- Italian ryegrasses -  
Festulolium spp.
- tall wheat grass
- phalaris -  
cocksfoots -  
fescues
- Puccinellia distans -  
veldt grass
- \* Berseem and subterranean clovers appear to be suitable legumes for this site.

#### 9 OAL34

- Italian ryegrasses -
- perennial ryegrasses -
- Festulolium spp. - Holcus  
lanatus (fog grass ) - tall  
wheat grass - phalaris .
- Puccinellia distans -
- Agrostis spp.
- \* Balansa, berseem and subterranean clovers appear to be suitable legumes .

## 90ES56

By the end of the season this site was considered a failure due to the enormous weed burden, although both herbicides and heavy grazing had been used to control weeds .

However, early in the season, some lines did do well and initially managed to survive the heavy grazing implemented to control weeds.

These lines were :

Bromus spp.  
veldt grass  
tall wheat  
grass  
Festulolium  
spp. Poa spp.  
perennial ryegrasses

Lucerne and serradella appeared promising as companion legumes.

## 90ES57

Once again a range of material initially looked promising at this site. However, Esperance has had one of its harshest summers in many years with hardly any summer rain.

Lines surviving these conditions are:

- tall wheat grass - phalaris  
- a wide range  
Cultivars BP88 and Maru appearing to be the strongest -  
fescue - cultivar Kenny originating from Oregon - U.S.A. -  
lucerne - cultivar Hunterfield

Subterranean clover and serradella appear to be the most appropriate legumes for this site.

## 90KÄIOO

This site was also considered a failure due to weeds and heavy locust attack.

However after summer rain in February, plots of phalaris -cultivars Maru, PX22 and Sirolan have regenerated and continue to grow strongly.

Lucerne and tall wheat grass with the legumes serradella and subterranean clover also looked promising prior to locust attack.

1991 TRIALS:

i) Trial : 91KA117  
Location : Katanning - annual rainfall 500mm  
Soil type: deep grey sand (coarse ) 1 metre  
+ to gravel pH (water) 5.9 - 6.0

Paddock history : extremely poor pasture (continuous )  
Species : 2 cultivars lucerne Evening primrose Sheep's  
burnett

33 species of perennial grasses including  
lines from 1990 trials that were considered  
promising. These grasses were sown as a  
mixture with serradella.

Sowing date : 24th May, 1991

SOWING PROCEDURE:

Sown with coneseeder at commercial sowing rates in 2 m x 50 m  
plots. All lines were randomized and replicated, All were  
established with 200 kg/ ha superphosphate plus copper, zinc  
, molydenmum.

MEASUREMENTS :

Will be the same as for 1990 trials with the inclusion of cuts for  
assessment of dry matter.

ii) Trial : 91KÄ116

Location : Broomehill - annual rainfall - 500 mm Soil  
type : heavy loam salt affected (0.41 dS/m) prone to  
waterlogging

pH (water) 5.4 - 5.6

Paddock history: 1988 - pasture

1989 - oats

Species : 2 varieties lucerne  
1 variety red clover  
1 variety chickory  
21 species of perennial grass including some  
of the promising lines from 1990 trials.  
Grass lines were sown as a mixture with  
balansa clover.

Sowing date : 24th May 1991

Sowing procedure: Sown with coneseeder at commercial sowing  
rates in 2 m x 30 m plots. All lines were  
randomized and replicated. All lines were  
sown with 200 kg/ ha superphosphate plus  
copper, zinc and molydenmum.

Measurements : as for 91KÄ117

iii ) 90KÄ100: Site to be re-sown using same design and same  
species as in the 1990 season. The three plots of  
surviving phalaris will continue to be assessed.

90ES56: This site will also be re-sown by hand however on a  
much smaller scale using only those species that  
showed some suitability to the soil type in the 1990  
season.

- iv) Several trial sites will be sown this season in collaboration with others :
- a) perennial grass evaluation with Mike Page (adviser, Narrogin) with sites at Boddington and Darkan.
  - b) perennial grass evaluation in association with Chris Shedley (adviser, Bunbury) with trial sites in North Boyup Brook and Collie areas .
  - c) perennial grass/ shrubs evaluation in association with Ted Lefroy at Pingrup.
  - d) seed supply to Laurie Cranberg's projects in Albany/ Esperance • e) seed supply to Alan McKay's ÄRGT 'host' grass trial in South Australia.
  - f) continued interaction with Kirsty Flower/ Kevin Boyce in Kybybolite, South Australia who are assessing similar perennial grasses.