

Summer sowing: alternative technique to introduce legumes into pastures

Angelo Loi & Bradley Nutt, Research Officers,
Department of Agriculture and Food Western Australia



Aim

To compare two methods for the establishment of pasture legumes (i) summer sowing where dormant hard-seed is drill sown into the paddock after the crop is harvested and (ii) traditional sowing where scarified seed is drill sown after the break of the season and knockdown weed control.

Background

Summer sowing is a technique that is being evaluated as a means to introduce legume species into pastures. It is being developed to enable a cost effective and convenient means to improve pasture production and quality using seed produced on the farm with minimal processing and at a low cost. This method firstly utilises legume seed dormancy to prevent undesirable germination and secondly, to have sufficient breakdown of this dormancy to provide adequate seedling establishment density under favourable conditions. Summer sowing requires a sowing operation in late summer or early autumn following crop harvesting and where there is expected to be a low weed burden. The pasture legume will establish as regenerating pasture making full use of the growing season. This technique has the potential to reduce the cost of the pasture legume establishment, particularly for species such as serradella where seed processing to enhance germination is difficult and costly.

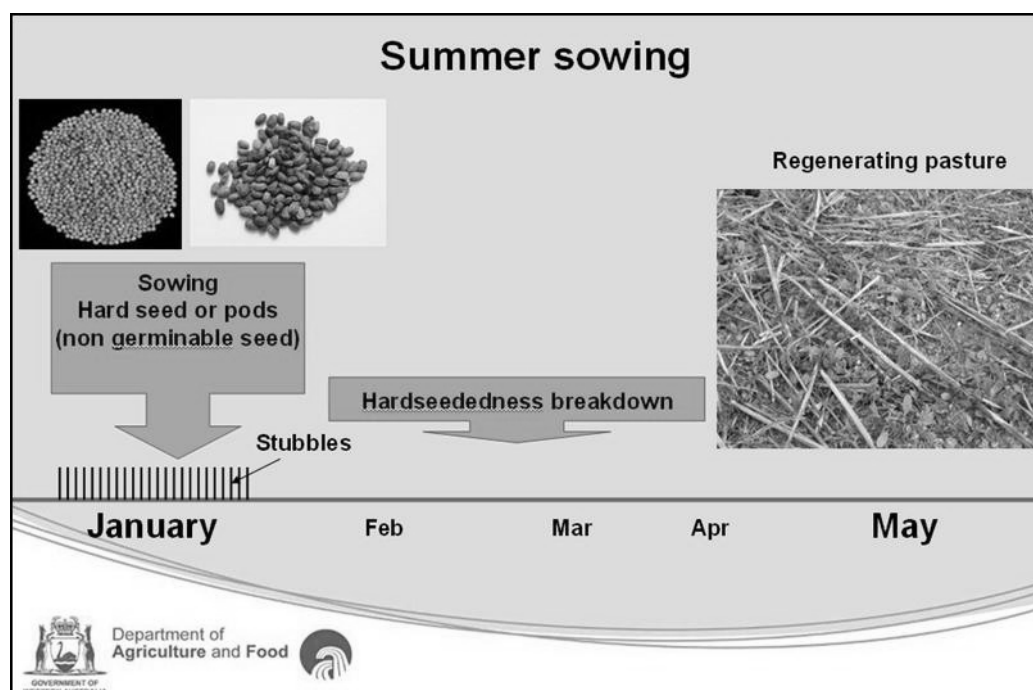


Figure 1: Time line of summer sowing seed breakdown.

Trial Details:

Property	Catalina Farms, Main Trial Site, East Coorow
Plot size & replication	50m x 5m x 3 replicates
Seeding date	3/2/11, 31/5/11

Seeding rate	50 kg/ha of pods (summer sowing) and 10 kg/ha of seed (normal sowing)
Fertiliser	120 kg/ha Super/Potash (3:1)
Inoculation	10 kg/ha ALOSCA S and C
Herbicides	31/5/11: 1 L/ha Kerb as post-sowing/pre-emergence
Growing Season Rainfall	330mm

Treatments:

Table 1: Treatments.

	Species	Sowing Time
1	Unsown	Summer
2	French Serradella Margurita	Autumn
3	Yellow Serradella GEH72.1a	Summer
4	Yellow Serradella GEH72.1a	Autumn
5	French Serradella Margurita	Summer
6	Subclover	Autumn

Results

Table 2: Plant establishment densities at East Coorow after summer sowing of dormant serradella pod and traditional sowing of scarified seed after weed knockdown.

Species	Treatment	Plants/m² 31/5/11
French serradella Margurita	Normal sowing	220
French serradella Margurita	Summer sowing	1013
Yellow serradella GEH72.1a	Normal sowing	302
Yellow serradella GEH72.1a	Summer sowing	776
Subclover	Normal sowing	213

Table 3: Dry matter production in winter and spring and seed yield (unsprayed and sprayed with glyphosate in spring) of annual pasture legumes sown at different times; at the break of the season (normal) and at the start of summer (summer sowing) at East Coorow.

Cultivar	Treatment	DM t/ha 14/7/11	DM t/ha 5/9/11	Seed Yield (kg/ha) Unsprayed	Seed Yield (kg/ha) Sprayed (Glyphosate Spring)
Margurita	Normal sowing	0	3676	489	62
Margurita	Summer sowing	1478	6124	348	99
GEH72.1a	Normal sowing	0	3111	1128	936
GEH72.1a	Summer sowing	1154	5906	1188	713
Dalkeith	Normal sowing	0	2992	173	195
Unsown		230	746	-	-

Advantages of summer sowing

Traditionally, forage legumes are sown after the main cropping program is completed and require the application of a pre-sowing knockdown herbicide to control established weeds. This treatment seriously reduces early winter pasture production which is then compounded by the slow growth rate of legumes under the cold winter conditions.

Summer sowing offers early winter grazing in a mixed enterprise farm. The technique has the ability to lift the legume component in a pasture which has degraded through a range of factors such as drought and/or intensive cropping. On a farm without grazing animals, summer sowing can be used to produce a green fallow with a high legume content that can be brown manured to provide high nitrogen residues and maximise the organic matter for the benefit of subsequent crops.

Summer sowing reduces establishment cost by firstly, minimising seed processing particularly in the case of serradella where seed extraction is difficult and expensive and secondly, sowing does not require a pre-sowing application of herbicide.

The requirement to sow hard-seeded cultivars in summer or early autumn does lose some of the flexibility to tactically respond to seasonal conditions and this needs to be balanced against the clear productivity advantages demonstrated.

The same trial was conducted at Mingenew. Results are presented below in Table 4.

Table 4: Plant establishment densities at Mingenew 2011 after summer sowing of dormant serradella pod and traditional sowing of scarified seed after weed knockdown.

Species	Treatment	Plants/m ² 31/5/11
French serradella Margurita	Normal sowing	330
French serradella Margurita	Summer sowing	510
Yellow serradella GEH72.1a	Normal sowing	340
Yellow serradella GEH72.1a	Summer sowing	410
Subclover	Normal sowing	210

Table 5: Dry matter production in winter and spring and seed yield (unsprayed and sprayed with glyphosate in spring) of annual pasture legumes sown at different times: at the break of the season (normal) and at the start of summer (summer sowing) at Mingenew in 2011.

Cultivar	Treatment	DM t/ha 14/7/11	DM t/ha 5/9/11	Seed Yield (kg/ha) Unsprayed	Seed Yield (kg/ha) Sprayed (Glyphosate Spring)
Margurita	Normal sowing	0.0	3.7	694	829
Margurita	Summer sowing	1.2	6.1	600	907
GEH72.1a	Normal sowing	0.0	3.1	3287	2933
GEH72.1a	Summer sowing	1.1	5.9	3148	3149
Dalkeith	Normal sowing	0.0	3.0	767	524
Unsown		0.4	0.7	-	-

Paper reviewed by: Dr Ron Yates, DAFWA

Contact

Angelo Loi, DAFWA
 angelo.loi@agric.wa.gov.au
 (08) 9368 3907