



A collaboration between AWI, GRDC, MLA, RIRDC and Dairy Australia

American jointvetch

Scientific name(s)

Aeschynomene americana

Strengths

- Grows in low-lying wet areas and waterlogged soils
- Tolerates low fertility soils.
- High nitrogen fixation.
- Compatible with grasses.
- High digestibility and nutritive value of leaf and young stem
- Very palatable.
- Persists under heavy grazing.
- Seed readily available and relatively inexpensive.
- Moderate shade tolerance.

Limitations

- Poor quality stand-over forage ('Glenn').
- Poor drought tolerance.
- Mature growth susceptible to powdery mildew.
- Seed crops attacked by heliothis bud worm.
- Susceptible to botrytis and powdery mildew.
- Slow seedling growth.

Plant description

Plant: A variable species, with erect to semi-erect or sprawling, annual or perennial shrub to about 2m tall and 2m across if left ungrazed. It can adapt its growth habit to the grazing pressure, becoming more branched, prostrate and leafy if grazed early, once established. The leaves and younger bristly stems emit distinctive odour due to glandular secretions.

Stems: Younger stems are soft and about 2 mm diameter, with erect bristles along their length. These become hollow, pithy and more rigid with age, losing the bristles. The main stem can become quite woody and develop to over 20 mm diameter if not restricted.

Leaves: Leaves feathery, 3 - 8 cm long, comprising 8 - 38 pairs of oblong, dark green (often with purplish tinge) leaflets, 3 - 15 mm long and 1 - 3 mm wide, along a main axis. Leaflets fold together at night, and when touched.

Flowers: Small pinkish to pale mauve or yellow-orange pea-shaped flowers 5 - 10 mm long, borne in small groups.

Pods: Flat, slightly curved, smooth on one edge, scalloped on the other, mostly comprising 5 - 8 segments about 4mm wide. Pods break into segments when ripe.

Seeds: Seeds kidney-shaped, 2 - 3 mm long and 1.5 - 2 mm wide, grey-green to light and dark brown or black. 150,000 - 300,000 pod segments/kg, or 350,000 - 500,000 dehulled seeds/kg.

Pasture type and use

American jointvetch is primarily used as a semi-permanent or regenerating legume component of a mixed pasture, or as a nitrogen-fixing pioneer in areas to which it is less well adapted. It can be used for hay if cut early while it is green and leafy, although some leaf can be lost during curing. While 'Lee' can be used for standover feed, 'Glenn' has limited value in this regard since leaves drop at maturity.

Where it grows

Rainfall

American jointvetch performs best under moist conditions, and should only be sown in areas receiving an average annual rainfall greater than 1,000mm, preferably in wetter situations. It is more tolerant of waterlogging and flooding than most warm season legumes, growth even appearing to be favoured by periods of waterlogging. It is intolerant of dry conditions.

Soils

It can be grown on sandy loams to clays (best on more fertile clays), preferably with pH above 5.5. It does not persist well on more sandy soils.

Temperature

Plants remain green with early light frosts, but heavier frosts can kill top material, and often the whole plant.

Establishment

Companion species

Grasses: guinea grass, humicola, pangola, setaria, signal grass, tall finger grass ('Jarra', 'Strickland', 'Arnhem')

Legumes: centro, common stylo, creeping vigna, hetero, phasey bean, pinto peanut

Sowing/planting rates as single species

4 - 6 kg/ha of pod segments or 2 - 3 kg/ha of dehulled seed. Freshly harvested seed has a high level of hard seed, which reduces with dehulling and/or storage. Seedlings grow slowly initially, but vigorously once properly established. Plants may take up to 10 weeks to reach a height of 60cm.

Sowing/planting rates in mixtures

2 - 3 kg/ha of pod segments or 1 - 2 kg/ha of dehulled seed.

Sowing time

It is best sown before the beginning of the wet season, since land suitable for this legume may not be accessible by machinery once the wet season commences.

Inoculation

American jointvetch will probably nodulate with rhizobium strains already in most soils, but as a precaution, it is best to inoculate seed with the most effective strain, "Jointvetch" (CB2312).

Fertiliser

While american jointvetch is tolerant of low fertility soils, it grows best in more fertile soils. As a rough guide, where available soil phosphorus levels are below about 10ppm, seed should be sown with about 200 kg/ha superphosphate or its equivalent. In more acid soils, molybdenum at 100g of elemental Mo should be applied every 3 - 5 years to ensure effective nitrogen fixation. Lime (CaCO₃) can be beneficial in very acid soils, ideally to adjust pH to >5.5.

Management

Maintenance fertiliser

Soil phosphorus levels should be maintained with annual dressings of 75 - 100 kg/ha superphosphate or its equivalent. Applications of potassium, zinc or molybdenum may be necessary on some soils.

Grazing/cutting

American jointvetch, although palatable and selectively grazed, withstands heavy grazing well. Relatively early grazing encourages dense low branching and development of a better leafy canopy structure. Since it is an annual or short-lived perennial, it is important for grazing management to favour seed set from time to time. If high levels of seed set are required, stock should be excluded prior to flowering, since little growth is produced once flowering commences. However, significant amounts of seed can still be set in low swards under grazing.

In existing stands, the area should be grazed heavily during the cold or dry season after seed set is complete, to create space for the following season's seedlings to develop. Grazing should be reduced or cease when seedlings reach a height of 5cm, and not recommenced until they are 30 - 45cm tall. Pastures can then be continuously grazed, or grazed on a 3- to 5-week rotation. Pastures in wetland should not be grazed or should be grazed lightly during the height of the rainy season to avoid trampling/pugging damage. This can be a disadvantage since plants lose their leaves at the end of the growing season and only poor quality stems remain. 'Lee' is less prone to end-of-season leaf drop, and is therefore more suitable where standover feed is required.

Seed production

'Glenn' flowers in late March to mid-April (later farther north) with 'Lee' flowering four to six weeks later. Commercial seed yields are of the order of 0.75 to 1 t/ha. Control of heliothis infestations is often necessary. Leaf and stem trash is a problem in harvesting and cleaning seed.

Ability to spread

Seed is rapidly spread by cattle, both on their coats and in dung, with new plants appearing up to 1 km from the source stand within 12 months.

Weed potential

American jointvetch, particularly 'Glenn', can be a weed of other legume seed crops and in irrigation channels.

Major pests

Heliothis (Helicoverpa) caterpillars attack flowers and developing seed pods often severely reducing seed production. Control of this pest may be required in seed crops.

Major diseases

Powdery mildew, which does not appear to affect production, quality or acceptability to animals, is common in the late wet season/early dry season. 'Lee' is less affected than 'Glenn'. Botrytis stem rot, which causes death of flowers and the growing tip, and spreads down the length of the stem, can significantly reduce seed production, if excessively wet weather is experienced at the end of the season. The impact of stem rot on seed production can be minimised by growing crops under irrigation in less humid areas.

Herbicide susceptibility

Tolerant of trifluralin, 2,4-D, 2,4-DB and MCPA, fluazifop butyl (e.g. Fusilade®), and sethoxydim (e.g. Poast®), but susceptible to acifluorfen (e.g. Blazer®), bentazone (e.g. Basagran®), imazethapyr (e.g. Spinnaker®) and dicamba.

Animal production

Feeding value

Crude protein levels in young leaf may be as high as 28% and in stem to 14%, although these are more commonly of the order of 20% and 10%. These are higher than those for most other tropical legumes. ADF levels in leaf are of the order of 16% and about 40% in stems, and IVDM of the tops mostly lies in the range, 60 - 70%.

Palatability

American jointvetch is selected at all stages of active growth, although mature plant stems remaining after dry season leaf-drop are not eaten.

Production potential

A very vigorous, well-managed stand is capable of producing over 10 t dry matter (DM)/ha, although yields of about 5 t/ha DM are more common. Cattle growth rates of 0.5 kg/hd/day have been measured, but seem low considering the DM productivity, the feeding value and the palatability of american jointvetch. Stocking rates of 1-2 steers/ha are possible on good stands.

Livestock disorders/toxicity

None recorded.

Cultivars

Group	Cultivar	Seed source/Information
Annual	Glenn	Australian Herbage Plant Cultivars
Perennial	Lee 	Southedge Seeds Australian Herbage Plant Cultivars

 Denotes that this variety is protected by Plant Breeder's Rights Australia

Further information

Tropical Forages database (SoFT) - American jointvetch
Pastures: Mackay Whitsunday region

Acknowledgements

Harry Bishop, formerly DPI&F, Mackay, Qld. "Pastures: Mackay Whitsunday region".

Arthur Cameron, DPIFM, NT "American Jointvetch" Agnote E22

Author and date

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