Popany

Purple Vetch

Vicia benghalensis

DOMESTIC

KEY FEATURES

- Late maturity 130 days
- Soft Seeded Type
- Mostly grown with cereals as combination for hay operations
- Suitable grazing type
- Generally, utilised in high rainfall/ irrigation areas due to its later flowering characteristic

POPANY is a purple vetch (Vicia benghalensis) variety. POPANY is a late-maturing variety, requiring more than 130 days from seeding to podding. It is a good variety in mid to high-rainfall areas for hay/ silage. Seeds are smaller than common vetch, therefore the seeding rates are lower at approximately 30 to 35kg/ha. POPANY possesses five to 10 per cent hard seeds. It can be grazed only from 10 nodes (40cm high) to podding stage. It is not recommended for grazing to occur earlier, or once plants have formed pods. Grain yield is significantly lower than for common vetch. Grain from this variety can be used as a bird feed in mixtures with other recommended grains. It has a black seed coat with distinctive white hilum.

Growing Conditions

Soil Type:

Popany is suited to a wide range of soil types from sandy loam to clay loams. Popany is moderately tolerant of waterlogging soils

Sowing Rate:

Grain 25 - 40kg/ha
Hay/ Silage 30 - 45kg/ha
Grazing 30 - 45kg/ha
Green Manure 30 - 45kg/ha

Rainfall:

450mm+

pH:

5.0 - 8.0 ($CaCl_2$)

Inoculant:

Group E Rhizobium

Pest Resistance

Popany can be susceptible to red-legged earth mite (Halotydens destructor) native bud worm (Helicoverpa punctigera) and cowpea aphid (Aphis craccivora).

Disease Tolerance/Resistance

Popany has demonstrated a high level of resistance to chocolate spot (Botrytis spp.) and rust (Uromyces trifolii-repentis) but is susceptible to downy mildew (Peronospora viciae).

Purple Vetch Agronomic Information

Scientific name *Vicia benghalensis*

Strengths

- Purple vetch is an annual pasture/forage/green manure plant. Palatable as green and dry matter
- Vetches have the ability to offer substantial improvements in soil fertility, structure and organic matter as well as offering a weed and disease break for cereals in a crop rotation
- For vetch planting, maintenance, cutting and harvesting farmers can use the same machinery that they use for cereal crops
- Vetch as a legume crop fixes atmospheric nitrogen that is beneficial in field crop rotation as well as in orchards, vineyards and cotton production
- Growing vetch in crop rotations as a pasture or hay can be a very good strategy for controlling resistant grass weeds, because they will be grazed or cut before grasses have formed or set seeds and it provides a disease break for cereal diseases
- Provides non-selective weed control options for reducing risk of herbicide resistant weeds in cropping phases (e.g. grazing, green manuring, hay production, spray-topping)

Limitations

- Grain from this variety cannot be used for feeding any livestock
- Purple vetch is 15-25% hard seeded and can occur as voluntary plants/weed in the following crops
- Initial growth is poor and requires clean land before seeding. In early growth stages it is a very poor competitor for weeds
- Cannot perform well in low rainfall (<350mm/yr.) areas
- Not well adapted to waterlogging
- In early growth stages they are sensitive to lucerne flea and in mid to later growth to cowpea aphids as well to Heliothus at the flowering and podding stages
- Herbicide options for broadleaf weed control are limited

Plant characteristics

Plant: winter growing annual, with multiple laterals branching from near the base. Initial growth is slow.

Stems: in early stages it is more erect than any other Vicia spp. Growth 40-100 cm high.

Leaflets: two pair, narrow green leaflets. The central leaf stalk containing 5-9 pair of oblong narrow leaves with a branched tendril on the top.

Flowers: small with multiple, 5-20 (10-20mm); colour-violet/ purple.

Pods: length 25-40mm by 8-11mm with 3-5 seeds.

Seed: is black and very distinctive, with a white hilum, compared to other vetch seeds, small to medium (100 seeds = 4.0-4.5g).

Pasture type and use

This species can be used as a pasture plant, hay/silage, bird seed and green manuring crop. Plant establishment is much slower than common vetches (in 10-12 weeks reaching 10-15cm high). This variety in Australian conditions grows rapidly during the second part of vegetation and generally is similar in dry matter production to Blanchefleur and Languedoc, higher than Rasina, and lower than Morava.

Where it grows

Rainfall

Annual rainfall of >350mm.

Soils

Adapted to a range of soil types from sandy loams to clays of moderate fertility.

Prefers neutral to alkaline soils.

Temperature

Adapted to Mediterranean and Temperate Zones of southern Australia.

Establishment

Companion species

Can be grown in mixtures with annual ryegrass, volunteer cereals or sown cereals for grass/egume pasture or hay production, and with a range of summer growing grasses in the subtropics.

Sowing/planting rates as single species

See table below - Plant and density and recommended seeding rates for vetch.

Sowing/planting rates in mixtures

For quality pastures or hay/silage use a mix of 2/3 vetch and 1/3) of rye grass or cereals (as a % of) the recommended rate for particular area.

Sowing time

For early feed/grazing obviously an early (mid-April- May) sowing time is needed, especially in lower rainfall areas. Dry matter production is significantly reduced if sowing is delayed to mid-June (for southern Australia). Sown at the same spacing as cereals; 17-19cm between rows, and 3-5cm deep.

Plant and density and recommended seeding rates for vetch

	Common vetch varieties		Woolly pod vetch varieties		Purple vetch variety	
End-use	Plant density (plants per sq.m.)	Sowing rate (kg/ha)	Plants density (plants per sq.m.)	Sowing rate (kg/ha)	Plants density (plants per sq.m.)	Sowing rate (kg/ha)
Grain	40-60	40-50	40-50	25-40	40-50	25-40
Hay/silage	50-70	50-60	50-60	30-45	50-60	30-45
Grazing	50-70	50-60	50-60	30-45	50-60	30-45
Green manure	60-70	55-65	60-70	45-50	50-60	30-45

Inoculation

Commercial Group E.

Fertiliser

This species has much slower initial growth, compared with common vetch, and requires 25-50kg/ha of nitrogen. Phosphorus at 50-75kg/ha is very important to be added at sowing time, and generally provides a good start and growth.

Management

Maintenance fertiliser

Generally vetches are grown in rotation with cereals that regularly use a combination of fertilizers; this provides enough residual nutrients to maintain soil fertility for vetch growth. So extra fertilizer applications during the growing season are not required.

Vetch has a strong root system that develops nodules at an early stage; this provides sufficient nitrogen for the plants to use and accumulates significant amounts for the following crops.

Grazing/cutting

Purple vetch is less resistant to grazing than common vetches. Regrowth is dependant significantly on rain or available moisture after grazing. Purple vetch is palatable for grazing and for hay/silage making.

This species/variety can be grazed only after 10 nodes (>40cm high) up to flowering, not before 10 nodes or after flowering - otherwise it can cause problems or even death of livestock.

The vetch plant and hay nutritive and feeding values are very satisfactory for ruminants. Dry matter (DM), dry matter digestibility (DMD), crude protein (CP), acid detergent fibre (ADF) neutral detergent fibre (NDF) and water-soluble carbohydrate, are inferior to the plant stage. As plant matures, DMD, leafiness and CP decreases and NDF and ADF increase. Just before flowering the nutritive value of vetches is at its best.

For hay/silage use the best time to cut vetches is the flowering stage before pod set, this gives the best balance between yield and quality. Hay should not be made if there is pod set as the seed is toxic to ruminants.

In crop mixtures with cereals or rye grass, varieties of these crops have to be chosen to mature at the same time as the vetch crop. Cereal machines are recommended for cutting and bailing.

Ability to spread

Not possible to spread by animals or birds.

Weed potential

Hard seeds can occur as voluntary plants/weeds in subsequent cereal crops for up to 3 years.

In cereal crops voluntary purple vetch can be easily controlled by many broadleaf herbicides that are regularly used for controlling broadleaf weeds in cereals.

Major pests

Lucerne flea, blue-green aphid, cowpea aphid and Heliothis.

Major diseases

Ascochyta (Ascochyta blight), Chocolate spot (Botrytis spp.)

Herbicide susceptibility

Tolerant of most grass-selective herbicides, check labels. Intolerant of herbicide residues from cropping phase, particularly sulfonylurea herbicides.

Susceptible to spray topping herbicides (Glyphosate, Paraquat & Diquat) as well to most broad leaf herbicides that are used in cereal crops.

Animal production

Feeding value

Hay samples show very high animal feeding values: crude protein (16-28%), digestible (50-82%) and metabolizable energy (7-11MJ). Hamilton Veterinary Institute - data of 225 samples of mixed vetch species.

Palatability

Green and dry plants are palatable for all ruminants.

Production potential

Excellent feed for growing and finishing livestock.

Dry residues of plants after spray topping provide a useful grazing crop through the summer.

Very good potential for exporting pure seeds to overseas countries for pastures, hay and green manuring.

Distinct seed testa colour allows the exporting of this variety as birdseed.

Livestock disorders/toxicity

Many reports have shown grain toxicity from this species has caused toxicity and even death of livestock.

Characteristics of selected vetch varieties									
Variety	Maturity	Yield potential		Flower colour	% of		Disease reaction		
		Grain	Dry matter		Pod shattering	Hard seeds	Rust	Ascochyta	Botrytis
COMMON VETCH VARIETIES (*VICIA SATIVA*)									
Studenica[Φ]	Very early	High	High	White	0-2	0	R	MS	S
Volga[Φ]	Early	Very high	High	Purple	0-2	2-5	R	MS	S
Rasina[Φ]	Early-mid	High	Moderate	Purple	0-2	0	R	MS	S
Blanchefleur	Mid	High	Moderate	White	5-10	5-10	VS	MR	S
Timok[Φ]	Mid	High	Very high	Purple	0-2	0-2	R	MS	S
Morava	Late	High	High	Purple	0	0	R	S	VS
PURPLE VETCH (*VICIA BENGHALENSIS* SUBSP. *BENGHALENSIS*)									
Popany	Very late	Low	High	Purple	20-30	5-10	R	S	VS
WOOLLY POD VETCHS (*VICIA VILLOSA* SUBSP.)									
RM4[Φ]	Mid	Moderate	Very high	Purple	2-5	2-5	R	MS	VS
Capello	Late	Low	Very high	Purple	5-10	15-20	R	S	VS
Haymaker	Late	Low	Very high	Purple	5-10	20-30	R	S	VS

Source: Pastures Australia and GRDC Crop Sowing Guide

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