

South Coast NSW Forage Value Index Annual Ryegrass

2023 Update

The Forage Value Index (FVI) is a tool that helps Australian dairy farmers and their advisors to make more informed decisions when selecting ryegrass cultivars.

It provides an accurate, reliable and independent assessment of the potential economic value of ryegrass cultivars across three different species (Perennial, Annual and Italian ryegrass) in a number of dairy-producing regions across Australia. The FVI is calculated by multiplying the Performance Value of each cultivar (i.e. total kilograms dry matter produced per hectare per season) by its Economic Value (i.e. the estimated value of this extra production per season). Performance Values for each variety are determined by industry assessed trial data. To be included in the FVI database, each cultivar must have data from at least three trials that have been conducted using strict industry approved protocols. For Perennial ryegrass, trials must be three years in length, whilst Annual & Italian ryegrass trials must be a minimum of one full growing season.

Reference varieties

Across the three different species of ryegrass, the Performance Value is expressed as the percentage change in yield relative to a selected reference cultivar which effectively acts as the genetic base for that species in the FVI. The reference cultivar is generally a well-known variety for each ryegrass species, where farmers and advisors are more likely to have a good understanding and knowledge of its performance over many years across various environments. The reference cultivars for each species are as follows:

- Perennial ryegrass: Victorian Ryegrass (Vic Rye)
- Annual Ryegrass: Tetila (from a certified source to ensure consistency across trials)
- Italian Ryegrass: Crusader

Figure 1 Map of trial locations across south eastern Australia that contributed to the FVI in 2023



Coloured bars

The FVI for each cultivar is expressed as a numerical value and is also assigned within a coloured bar. The FVI value is a prediction of extra operating profit per hectare over and above the reference cultivar in each species, which always has an FVI value of 0. Cultivars within the same-coloured bar are not significantly different to each other at the 95 per cent confidence interval.

The FVI information allows users to rank cultivars according to their region and user nominated attributes (e.g. seasonal yields, ploidy, heading date, endophyte). The number of trials in which the cultivar has been tested is also included in the table.

Seasonal yield tables

The accompanying tables of cultivar performance during the various FVI seasons are of particular importance to dairy farmers, depending upon their farming system and calving pattern. For example, dairy farmers that calve in the autumn might favour those cultivars that have a higher performance value for autumn and winter as they would likely value greater winter growth in their pastures. The vast majority of trial data comes from the Pasture Trial Network (PTN), and users can now check out the details of individual trials on the PTN in addition to the FVI rankings. They can be accessed at etools.mla.com.au/ptn or by scanning the QR code.



Autumn seasonal values for annual and Italian ryegrass FVI's

In 2023, performance values for Autumn in the Annual & Italian ryegrass FVI's have been removed from the index. The first harvest was not taken from the majority of these trials until after the 31st May and this meant that data for Autumn (March-May) which reflects very early establishment in these varieties was too limited for us to fully be confident it accurately reflected differences in the varieties at this time of the year. The solution is to generate more yield data before 31st May by sowing these trials earlier in the growing season and that is the aim for 2023 trials. However, most trials are dryland and therefore the timing of the autumn break is a big factor in establishing trials successfully. Recent autumn breaks in many regions particularly in Victoria have been very variable. This change only applies to Annual and Italian ryegrass FVI's. Perennial trials run for three years and so sufficient data is collected in autumn in these trials.



South Coast NSW: Forage Value Index 2023 – ANNUAL RYEGRASS

Cultivar	FVI South Coast NSW	Winter	Early Spring	Late Spring	Summer	Endophyte	Ploidy	Heading Date	Marketer	No. of trials	
										Overall	South Coast NSW
Hogan	255	102	101	108	153	Nil	T	Late	Barenbrug Australia	11	1
Mach 1	252	104	101	109	148	Nil	T	Mid	DLF Seeds	15	1
SF Pinnacle AGF	250	100	101	107	155	Nil	T	Late	AGF Seeds/(Seed Force in WA only)	14	1
Ascend	239	101	98	111	151	Nil	T	Mid	DLF Seeds	15	1
SF Speedyl	238	99	101	108	153	Nil	T	Late	Seed Force	10	1
WinterStar II	233	102	102	109	144	Nil	T	Late	DLF Seeds	6	0
Jivet	223	101	101	108	147	Nil	T	Late	DLF Seeds	8	0
Dominator	205	104	102	108	136	Nil	T	Mid-Late	Vicseeds	5	0
Zoom	203	104	101	107	138	Nil	T	Late	Cropmark Seeds	4	0
Bullet	197	102	101	108	138	Nil	T	Late	Notman Pasture Seeds	3	0
Fuze	193	99	101	107	141	Nil	D	Late	Barenbrug Australia	10	1
Vortex	191	103	102	108	133	Nil	T	Mid-Late	Barenbrug Australia	5	1
SF Adrenalin 2	184	102	100	106	138	Nil	T	Late	Seed Force	7	1
Epic	180	102	101	107	135	Nil	D	Mid	Vicseeds	3	0
Dash	176	99	98	108	141	Nil	T	Very Late	Cropmark Seeds	6	0
SF Rozen	176	101	101	106	136	Nil	D	Late	Seed Force	4	0
Apex	174	107	101	105	132	Nil	T	Late	AGF Seeds	9	1
Arnie	167	104	102	107	128	Nil	D	Late	Barenbrug Australia	3	0
Atomic	163	102	101	108	130	Nil	T	Mid	Upper Murray Seeds	3	1
Dargo	100	105	102	104	112	Nil	D	Early	Vicseeds	5	0
Tetila	0	100	100	100	100	Nil	T	Early	Many	15	1

Notes

- 1 Data to create the performance values for each cultivar was taken from 15 Annual ryegrass trials. The trials were located in the following regions and were measured at various stages between 2015 and 2021 – Leongatha, Terang, Howlong (x3), Kiewa Valley, Taree, Aberdeen (x3), Lardner Park, Bega, Warrnambool, Colac and MacArthur.
- 2 Tetila is a ecotype not a certified variety. However in all PTN trials included in the FVI, a certified form of Tetila - *New Tetila annual ryegrass*, has been used as a reference for the performance of all other cultivars.

Legend

Heading	Description
Cultivar	A plant variety that has been produced by selective breeding. Cultivars are as listed as on the Australian Seed Federation Pasture Seed Database.
Colour bars	Cultivars with the same colour are not significantly different from each other.
FVI	The rating is based on the outcome of economic and performance values for each cultivar.
Seasonal performance	The performance value is based on the difference in dry matter production between a cultivar's seasonal performance and that of Tetila annual ryegrass. This is a percentage ranking – percent better or worse than Tetila ryegrass. For example, Tetila is always 100 for each FVI season. A cultivar that is 110 means that it produced 110 per cent of the dry matter produced by Tetila in that particular FVI season. A cultivar that is 97 means it produced 97 per cent of the dry matter produced by Tetila in that particular FVI season.
Autumn	March/April/May
Winter	June/July
Early spring	August/September
Late spring	October/November
Summer	December/January/February
Endophyte	A fungus which protects plants from a range of insect pests. Different types of endophytes affect persistence, dry matter production, insect pest species and nutritive value in different ways.
Ploidy	The number of chromosomes per cell in the plant. A diploid ryegrass has two, while a tetraploid has four.
Heading date	The date when 50 per cent of the plants of a variety have emerged seed heads in a typical year. Heading dates are listed on the Australian Seed Federation Pasture Seed Database.
Marketer	The company marketing the cultivar.
No. of trials	To be included in the Annual ryegrass Forage Value Index database, each cultivar must have data from at least three, one-year trials.



Economic values

The economic values are a key aspect of the overall forage value index. Whilst the performance values are the same across all regions in the FVI at present, the seasonal value of the extra pasture is different across the regions. Hence, localised regional tables are provided to more accurately reflect the marginal value of a kilogram of ryegrass in the different parts of the country. The way the economic values are calculated for the FVI changed for the 2022 release.

Original individual case study farm approach

When the FVI was first introduced, economic values were developed using a case study farm approach in each of the four regions where perennial ryegrass is dominant (South West Victoria, Northern Victoria, Gippsland and Tasmania). A typical dairy system based on a real farm business in each region was modelled, with the base monthly estimated metabolisable energy requirements of the herd, the feed consumed, and the pasture consumption per hectare defined. For each of the five FVI seasons, the economic value of the additional pasture to the case study farm system was estimated according to the market value of feeds that the additional pasture replaced (on an equivalent energy basis), or as the net market value of hay or silage produced if the additional pasture was surplus to the case study farm requirements. Farming systems, even within regions in Australia, are quite diverse by comparison to other pasture based dairy industries elsewhere in the world. The case study farm approach to determine economic values provided a good indication of the general value of additional pasture yield in each region, but was limited by how representative the case study farm is for each region.

New market value approach

The new approach for calculating economic values simplifies the way extra seasonal pasture production is valued. Seasons when grazed pasture is typically in deficit and in surplus are defined for each FVI region. For example, in Gippsland, pasture was assumed to be in deficit during summer, autumn and winter, and in surplus during early and late spring. Extra pasture produced in a period when it is typically in deficit is valued more than in periods when it is typically in surplus. In seasons of deficit, extra pasture is valued as its maximum replacement cost; as purchased supplementary feed, and in seasons of surplus it is valued at its minimum salvage value; as standing hay to be conserved. Market prices (2011-2018 average price) of feeds delivered to each region were used to establish these maximum and minimum economic values on an equivalent nutritive value basis.

How the new approach for calculating economic values affects the ranking of cultivars in the FVI

A previous release of the FVI was used to compare the two methods of calculating the economic values, to assess whether it made a difference to the FVI rankings. The FVI of 19 perennial ryegrass cultivars was calculated using the economic values from the original case study farm method and the market value approach, across the three Victorian regions. The 19 cultivars were compared to a common reference cultivar (Victorian), which was assigned a value of zero. Using the economic values calculated by the original method case study farm method, the 19 cultivars were calculated to be worth an extra \$0-\$180 per ha more than Victorian ryegrass, the reference cultivar. Using the economic values calculated by the market value approach, the same 19 cultivars were calculated to be worth an extra \$24-\$200/ha more than the same reference cultivar. Hence, it is clear that there is good agreement between the two methods for calculating the economic values.

Advantages of the market value approach

There are several advantages to using the market value approach. First, the economic values are applicable to all producers who buy and sell substitutes for grazed pasture, and who experience similar timings of pasture surpluses and deficits. This removes the limitations of having a single representative farm for each region. Second, the simplified approach makes it easier to communicate how the economic values have been calculated. This enables farmers to more easily consider how the FVI rankings relate to their individual circumstances. Lastly, regional differences can be accounted for in seasonality of pasture supply, and feed types and prices, and the economic values are relatively straightforward to update once established.



New economic values updated for 2022 onwards

The 2022 update of the FVI used newly updated economic values for all three ryegrass species and the same EV's are again in use for this update in 2023. In South West Victoria, Northern Victoria, Gippsland and Tasmania, grazed pasture was assumed to be in deficit during autumn, winter and summer, and surplus during early spring and late spring. In the two new regions of South Coast NSW and North Coast NSW, grazed pasture was assumed to be in deficit during autumn and winter and surplus during early spring, late spring, and summer.

Separate economic values for dry matter yield have now been calculated for perennial ryegrass cultivars and for annual/Italian ryegrass cultivars for the Victorian and Tasmanian regions. This aims to better reflect differences in the seasonal nutritive value of perennial vs. annual/Italian ryegrasses when calculating the economic values.

Perennial Ryegrass economic values for the Forage Value Index (\$/kg DM)

Region	Autumn	Winter	Early Spring	Late Spring	Summer
South West Victoria	0.36	0.37	0.31	0.29	0.32
Northern Victoria	0.36	0.37	0.30	0.28	0.32
Gippsland	0.41	0.42	0.35	0.33	0.37
Tasmania	0.39	0.41	0.31	0.30	0.36

Annual and Italian Ryegrass economic values for the Forage Value Index (\$/kg DM)

Region	Autumn	Winter	Early Spring	Late Spring	Summer
South West Victoria	0.37	0.37	0.29	0.29	0.35
Northern Victoria	0.38	0.38	0.30	0.30	0.36
Gippsland	0.42	0.42	0.35	0.35	0.40
Tasmania	0.41	0.42	0.31	0.31	0.38
South Coast NSW	0.44	0.44	0.37	0.37	0.36
North Coast NSW	0.47	0.48	0.38	0.38	0.38

South Coast NSW: Winter seasonal performance – ANNUAL RYEGRASS

Cultivar	Winter	Early Spring	Late Spring	Summer	FVI South Coast NSW	Endophyte	Ploidy	Heading Date	Marketer	No. of trials
Apex	107	101	105	132	174	Nil	T	Late	AGF Seeds	9
Dargo	105	102	104	112	100	Nil	D	Early	Vicseeds	5
Dominator	104	102	108	136	205	Nil	T	Mid-Late	Vicseeds	5
Zoom	104	101	107	138	203	Nil	T	Late	Cropmark Seeds	4
Mach 1	104	101	109	148	252	Nil	T	Mid	DLF Seeds	15
Arnie	104	102	107	128	167	Nil	D	Late	Barenbrug Australia	3
Vortex	103	102	108	133	191	Nil	T	Mid-Late	Barenbrug Australia	5
SF Adrenalin 2	102	100	106	138	184	Nil	T	Late	Seed Force	7
WinterStar II	102	102	109	144	233	Nil	T	Late	DLF Seeds	6
Bullet	102	101	108	138	197	Nil	T	Late	Notman Pasture Seeds	3
Epic	102	101	107	135	180	Nil	D	Mid	Vicseeds	3
Atomic	102	101	108	130	163	Nil	T	Mid	Upper Murray Seeds	3
Hogan	102	101	108	153	255	Nil	T	Late	Barenbrug Australia	11
Jivet	101	101	108	147	223	Nil	T	Late	DLF Seeds	8
Ascend	101	98	111	151	239	Nil	T	Mid	DLF Seeds	15
SF Rozen	101	101	106	136	176	Nil	D	Late	Seed Force	4
SF Pinnacle AGF	100	101	107	155	250	Nil	T	Late	AGF Seeds/(Seed Force in WA only)	14
Tetila	100	100	100	100	0	Nil	T	Early	Many	15
SF Speedyl	99	101	108	153	238	Nil	T	Late	Seed Force	10
Fuze	99	101	107	141	193	Nil	D	Late	Barenbrug Australia	10
Dash	99	98	108	141	176	Nil	T	Very Late	Cropmark Seeds	6

South Coast NSW: early Spring seasonal performance – ANNUAL RYEGRASS

Cultivar	Early Spring	Late Spring	Summer	Winter	FVI South Coast NSW	Endophyte	Ploidy	Heading Date	Marketer	No. of trials
WinterStar II	102	109	144	102	233	Nil	T	Late	DLF Seeds	6
Vortex	102	108	133	103	191	Nil	T	Mid-Late	Barenbrug Australia	5
Dargo	102	104	112	105	100	Nil	D	Early	Vicseeds	5
Dominator	102	108	136	104	205	Nil	T	Mid-Late	Vicseeds	5
Arnie	102	107	128	104	167	Nil	D	Late	Barenbrug Australia	3
SF Pinnacle AGF	101	107	155	100	250	Nil	T	Late	AGF Seeds/(Seed Force in WA only)	14
Hogan	101	108	153	102	255	Nil	T	Late	Barenbrug Australia	11
Zoom	101	107	138	104	203	Nil	T	Late	Cropmark Seeds	4
SF Speedyl	101	108	153	99	238	Nil	T	Late	Seed Force	10
Mach 1	101	109	148	104	252	Nil	T	Mid	DLF Seeds	15
Fuze	101	107	141	99	193	Nil	D	Late	Barenbrug Australia	10
Jivet	101	108	147	101	223	Nil	T	Late	DLF Seeds	8
Epic	101	107	135	102	180	Nil	D	Mid	Vicseeds	3
Bullet	101	108	138	102	197	Nil	T	Late	Notman Pasture Seeds	3
Apex	101	105	132	107	174	Nil	T	Late	AGF Seeds	9
Atomic	101	108	130	102	163	Nil	T	Mid	Upper Murray Seeds	3
SF Rozen	101	106	136	101	176	Nil	D	Late	Seed Force	4
SF Adrenalin 2	100	106	138	102	184	Nil	T	Late	Seed Force	7
Tetila	100	100	100	100	0	Nil	T	Early	Many	15
Dash	98	108	141	99	176	Nil	T	Very Late	Cropmark Seeds	6
Ascend	98	111	151	101	239	Nil	T	Mid	DLF Seeds	15

South Coast NSW: Summer seasonal performance – ANNUAL RYEGRASS

Cultivar	Summer	Winter	Early Spring	Late Spring	FVI South Coast NSW	Endophyte	Ploidy	Heading Date	Marketer	No. of trials
SF Pinnacle AGF	155	100	101	107	250	Nil	T	Late	AGF Seeds/(Seed Force in WA only)	14
Hogan	153	102	101	108	255	Nil	T	Late	Barenbrug Australia	11
SF Speedyl	153	99	101	108	238	Nil	T	Late	Seed Force	10
Ascend	151	101	98	111	239	Nil	T	Mid	DLF Seeds	15
Mach 1	148	104	101	109	252	Nil	T	Mid	DLF Seeds	15
Jivet	147	101	101	108	223	Nil	T	Late	DLF Seeds	8
WinterStar II	144	102	102	109	233	Nil	T	Late	DLF Seeds	6
Fuze	141	99	101	107	193	Nil	D	Late	Barenbrug Australia	10
Dash	141	99	98	108	176	Nil	T	Very Late	Cropmark Seeds	6
Bullet	138	102	101	108	197	Nil	T	Late	Notman Pasture Seeds	3
SF Adrenalin 2	138	102	100	106	184	Nil	T	Late	Seed Force	7
Zoom	138	104	101	107	203	Nil	T	Late	Cropmark Seeds	4
SF Rozen	136	101	101	106	176	Nil	D	Late	Seed Force	4
Dominator	136	104	102	108	205	Nil	T	Mid-Late	Vicseeds	5
Epic	135	102	101	107	180	Nil	D	Mid	Vicseeds	3
Vortex	133	103	102	108	191	Nil	T	Mid-Late	Barenbrug Australia	5
Apex	132	107	101	105	174	Nil	T	Late	AGF Seeds	9
Atomic	130	102	101	108	163	Nil	T	Mid	Upper Murray Seeds	3
Arnie	128	104	102	107	167	Nil	D	Late	Barenbrug Australia	3
Dargo	112	105	102	104	100	Nil	D	Early	Vicseeds	5
Tetila	100	100	100	100	0	Nil	T	Early	Many	15

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