

South-coast NSW Forage Value Index

Annual ryegrass

2024 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, while Annual and 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 that effectively acts as the genetic base for that species in the FVI.

Figure 1 Map of trial locations across South-eastern Australia that contributed to the FVI.



The reference cultivar is 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.**

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 FVIs

In 2023, performance values for autumn in the Annual and Italian ryegrass FVIs were removed from the index. The first harvest was not taken from the majority of these trials until after 31 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 31 May by sowing these trials earlier in the growing season. 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 FVIs. Perennial trials run for three years and so sufficient data is collected in autumn in these trials.

In 2023, three new Italian and three new annual ryegrass trials were sown early enough to generate yield data before 31 May, so next year's FVI (2025) will have autumn performance values once again, when these trials are added to the FVI.



South-coast NSW: Forage Value Index 2024 – ANNUAL RYEGRASS

Cultivar		FVI Sth- coast NSW	Total trials	Winter	Early spring	Late spring	Summer	Endophyte	Ploidy	Heading date	Marketer	Sth- coast NSW trials
Hogan	■	423	13	110	105	116	176	Nil	Tetraploid	Late	Barenbrug Australia	1
WinterStar II	■ ■	411	6	107	109	121	161	Nil	Tetraploid	Late	DLF Seeds	0
Torpedo LM	■ ■	401	3	116	105	111	170	Nil	Tetraploid	Late	Upper Murray Seeds	0
Zoom	■ ■	395	7	117	106	114	160	Nil	Tetraploid	Late	Cropmark Seeds	0
Bullet	■ ■	348	3	106	103	110	173	Nil	Tetraploid	Late	Notman Pasture Seeds	0
Mach 1	■ ■	340	17	112	105	111	156	Nil	Tetraploid	Mid	DLF Seeds	1
Ascend	■ ■	334	18	107	102	117	158	Nil	Tetraploid	Mid	DLF Seeds	1
Dominator	■ ■	322	7	115	107	113	141	Nil	Tetraploid	Late	Tasglobal Seeds	0
Pinnacle	■ ■	312	17	108	104	109	160	Nil	Tetraploid	Late	AGF Seeds/(RAGT in WA only)	1
Fuze	■ ■	308	12	100	103	112	166	Nil	Diploid	Late	Barenbrug Australia	1
Speedyl	■ ■	307	13	107	105	110	156	Nil	Tetraploid	Late	RAGT	1
Apex 2	■ ■	280	4	122	102	108	134	Nil	Tetraploid	Late	AGF Seeds	0
Jivet	■ ■	275	9	106	102	111	152	Nil	Tetraploid	Late	DLF Seeds	0
Loader	■ ■	269	3	98	104	116	149	Nil	Tetraploid	Late	S&W Seed Company	0
Adrenalin 2	■ ■	252	10	111	100	107	149	Nil	Tetraploid	Late	RAGT	1
Epic	■ ■	236	4	104	104	110	140	Nil	Diploid	Mid-Late	AGF Seeds	0
Dash	■ ■	228	9	94	94	111	170	Nil	Tetraploid	Very Late	Cropmark Seeds	0
Vortex	■ ■	227	5	110	109	116	109	Nil	Tetraploid	Mid-Late	Barenbrug Australia	1
Rozen	■ ■	224	7	104	101	108	147	Nil	Diploid	Late	RAGT	0
Buster	■ ■ ■	200	3	94	97	111	156	Nil	Diploid	Mid-Late	Valley Seeds	0
Apex	■ ■ ■	198	11	113	102	105	129	Nil	Tetraploid	Late	AGF Seeds	1
Atomic	■ ■ ■	159	5	109	100	111	116	Nil	Tetraploid	Mid	Upper Murray Seeds	1
Tetila	■ ■ ■ ■	0	18	100	100	100	100	Nil	Tetraploid	Early	Various	1
Dargo	■ ■ ■ ■	-122	5	111	104	94	50	Nil	Diploid	Early	Various	0

Notes

- 1 Data to create the performance values for each cultivar were collected from 18 Annual ryegrass trials. The trials were located in the following regions and were measured at various stages between 2015 and 2022 – Leongatha, Terang, Howlong (x3), Kiwa Valley, Taree, Aberdeen (x3), Lardner Park, Bega, Warrnambool, Colac and Macarthur. This year, new trials were added from Warrnambool (South-west Vic), Bairnsdale (Gippsland) and Oaks (Tasmania).
- 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.
- 3 The total number of trials can be used as an indication of the reliability of the ranking for each cultivar. Cultivars with large trial numbers are likely to be more accurate in their position in the list. The minimum number of trials is three, and most of these cultivars are newer and will have more trial data added to the FVI in the coming years to bolster their accuracy.

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.
Total trials	To be included in the Italian ryegrass Forage Value Index database, each cultivar must have data from at least three, one-year trials.
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.



Economic values

The economic values are a key aspect of the overall Forage Value Index. While 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 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 EVs are again in use for this update in 2024. 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 versus 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
Mid-north coast NSW	0.47	0.48	0.38	0.38	0.38

South-coast NSW winter seasonal performance – ANNUAL RYEGRASS

Cultivar	FVI Sth-coast NSW	Winter	Early spring	Late spring	Summer	Endophyte	Ploidy	Heading date	Marketer	Total trials
Apex 2	280	122	102	108	134	Nil	Tetraploid	Late	AGF Seeds	4
Zoom	395	117	106	114	160	Nil	Tetraploid	Late	Cropmark Seeds	7
Torpedo LM	401	116	105	111	170	Nil	Tetraploid	Late	Upper Murray Seeds	3
Dominator	322	115	107	113	141	Nil	Tetraploid	Late	Tasglobal Seeds	7
Apex	198	113	102	105	129	Nil	Tetraploid	Late	AGF Seeds	11
Mach 1	340	112	105	111	156	Nil	Tetraploid	Mid	DLF Seeds	17
Adrenalin 2	252	111	100	107	149	Nil	Tetraploid	Late	RAGT	10
Dargo	-122	111	104	94	50	Nil	Diploid	Early	Various	5
Hogan	423	110	105	116	176	Nil	Tetraploid	Late	Barenbrug Australia	13
Vortex	227	110	109	116	109	Nil	Tetraploid	Mid-Late	Barenbrug Australia	5
Atomic	159	109	100	111	116	Nil	Tetraploid	Mid	Upper Murray Seeds	5
Pinnacle	312	108	104	109	160	Nil	Tetraploid	Late	AGF Seeds/(RAGT in WA only)	17
WinterStar II	411	107	109	121	161	Nil	Tetraploid	Late	DLF Seeds	6
Ascend	334	107	102	117	158	Nil	Tetraploid	Mid	DLF Seeds	18
Speedyl	307	107	105	110	156	Nil	Tetraploid	Late	RAGT	13
Jivet	275	106	102	111	152	Nil	Tetraploid	Late	DLF Seeds	9
Bullet	348	106	103	110	173	Nil	Tetraploid	Late	Notman Pasture Seeds	3
Epic	236	104	104	110	140	Nil	Diploid	Mid-Late	AGF Seeds	4
Rozen	224	104	101	108	147	Nil	Diploid	Late	RAGT	7
Fuze	308	100	103	112	166	Nil	Diploid	Late	Barenbrug Australia	12
Tetila	0	100	100	100	100	Nil	Tetraploid	Early	Various	18
Loader	269	98	104	116	149	Nil	Tetraploid	Late	S&W Seed Company	3
Buster	200	94	97	111	156	Nil	Diploid	Mid-Late	Valley Seeds	3
Dash	228	94	94	111	170	Nil	Tetraploid	Very Late	Cropmark Seeds	9

South-coast NSW early spring seasonal performance – ANNUAL RYEGRASS

Cultivar	FVI Sth- coast NSW	Early spring	Late spring	Summer	Winter	Endophyte	Ploidy	Heading date	Marketer	Total trials
Vortex	227	109	116	109	110	Nil	Tetraploid	Mid-Late	Barenbrug Australia	5
WinterStar II	411	109	121	161	107	Nil	Tetraploid	Late	DLF Seeds	6
Dominator	322	107	113	141	115	Nil	Tetraploid	Late	Tasglobal Seeds	7
Zoom	395	106	114	160	117	Nil	Tetraploid	Late	Cropmark Seeds	7
Hogan	423	105	116	176	110	Nil	Tetraploid	Late	Barenbrug Australia	13
Speedyl	307	105	110	156	107	Nil	Tetraploid	Late	RAGT	13
Mach 1	340	105	111	156	112	Nil	Tetraploid	Mid	DLF Seeds	17
Torpedo LM	401	105	111	170	116	Nil	Tetraploid	Late	Upper Murray Seeds	3
Pinnacle	312	104	109	160	108	Nil	Tetraploid	Late	AGF Seeds/(RAGT in WA only)	17
Epic	236	104	110	140	104	Nil	Diploid	Mid-Late	AGF Seeds	4
Loader	269	104	116	149	98	Nil	Tetraploid	Late	S&W Seed Company	3
Dargo	-122	104	94	50	111	Nil	Diploid	Early	Various	5
Bullet	348	103	110	173	106	Nil	Tetraploid	Late	Notman Pasture Seeds	3
Fuze	308	103	112	166	100	Nil	Diploid	Late	Barenbrug Australia	12
Apex 2	280	102	108	134	122	Nil	Tetraploid	Late	AGF Seeds	4
Ascend	334	102	117	158	107	Nil	Tetraploid	Mid	DLF Seeds	18
Apex	198	102	105	129	113	Nil	Tetraploid	Late	AGF Seeds	11
Jivet	275	102	111	152	106	Nil	Tetraploid	Late	DLF Seeds	9
Rozen	224	101	108	147	104	Nil	Diploid	Late	RAGT	7
Atomic	159	100	111	116	109	Nil	Tetraploid	Mid	Upper Murray Seeds	5
Adrenalin 2	252	100	107	149	111	Nil	Tetraploid	Late	RAGT	10
Tetila	0	100	100	100	100	Nil	Tetraploid	Early	Various	18
Buster	200	97	111	156	94	Nil	Diploid	Mid-Late	Valley Seeds	3
Dash	228	94	111	170	94	Nil	Tetraploid	Very Late	Cropmark Seeds	9

South-coast NSW late spring seasonal performance – ANNUAL RYEGRASS

Cultivar	FVI Sth- coast NSW	Late spring	Summer	Winter	Early spring	Endophyte	Ploidy	Heading date	Marketer	Total trials
WinterStar II	411	121	161	107	109	Nil	Tetraploid	Late	DLF Seeds	6
Ascend	334	117	158	107	102	Nil	Tetraploid	Mid	DLF Seeds	18
Vortex	227	116	109	110	109	Nil	Tetraploid	Mid-Late	Barenbrug Australia	5
Loader	269	116	149	98	104	Nil	Tetraploid	Late	S&W Seed Company	3
Hogan	423	116	176	110	105	Nil	Tetraploid	Late	Barenbrug Australia	13
Zoom	395	114	160	117	106	Nil	Tetraploid	Late	Cropmark Seeds	7
Dominator	322	113	141	115	107	Nil	Tetraploid	Late	Tasglobal Seeds	7
Fuze	308	112	166	100	103	Nil	Diploid	Late	Barenbrug Australia	12
Mach 1	340	111	156	112	105	Nil	Tetraploid	Mid	DLF Seeds	17
Dash	228	111	170	94	94	Nil	Tetraploid	Very Late	Cropmark Seeds	9
Jivet	275	111	152	106	102	Nil	Tetraploid	Late	DLF Seeds	9
Torpedo LM	401	111	170	116	105	Nil	Tetraploid	Late	Upper Murray Seeds	3
Buster	200	111	156	94	97	Nil	Diploid	Mid-Late	Valley Seeds	3
Atomic	159	111	116	109	100	Nil	Tetraploid	Mid	Upper Murray Seeds	5
Epic	236	110	140	104	104	Nil	Diploid	Mid-Late	AGF Seeds	4
Speedyl	307	110	156	107	105	Nil	Tetraploid	Late	RAGT	13
Bullet	348	110	173	106	103	Nil	Tetraploid	Late	Notman Pasture Seeds	3
Pinnacle	312	109	160	108	104	Nil	Tetraploid	Late	AGF Seeds/(RAGT in WA only)	17
Apex 2	280	108	134	122	102	Nil	Tetraploid	Late	AGF Seeds	4
Rozen	224	108	147	104	101	Nil	Diploid	Late	RAGT	7
Adrenalin 2	252	107	149	111	100	Nil	Tetraploid	Late	RAGT	10
Apex	198	105	129	113	102	Nil	Tetraploid	Late	AGF Seeds	11
Tetila	0	100	100	100	100	Nil	Tetraploid	Early	Various	18
Dargo	-122	94	50	111	104	Nil	Diploid	Early	Various	5

South-coast NSW summer seasonal performance – ANNUAL RYEGRASS

Cultivar	FVI Sth-coast NSW	Summer	Winter	Early spring	Late spring	Endophyte	Ploidy	Heading date	Marketer	Total trials
Hogan	423	176	110	105	116	Nil	Tetraploid	Late	Barenbrug Australia	13
Bullet	348	173	106	103	110	Nil	Tetraploid	Late	Notman Pasture Seeds	3
Torpedo LM	401	170	116	105	111	Nil	Tetraploid	Late	Upper Murray Seeds	3
Dash	228	170	94	94	111	Nil	Tetraploid	Very Late	Cropmark Seeds	9
Fuze	308	166	100	103	112	Nil	Diploid	Late	Barenbrug Australia	12
WinterStar II	411	161	107	109	121	Nil	Tetraploid	Late	DLF Seeds	6
Zoom	395	160	117	106	114	Nil	Tetraploid	Late	Cropmark Seeds	7
Pinnacle	312	160	108	104	109	Nil	Tetraploid	Late	AGF Seeds/(RAGT in WA only)	17
Ascend	334	158	107	102	117	Nil	Tetraploid	Mid	DLF Seeds	18
Speedyl	307	156	107	105	110	Nil	Tetraploid	Late	RAGT	13
Mach 1	340	156	112	105	111	Nil	Tetraploid	Mid	DLF Seeds	17
Buster	200	156	94	97	111	Nil	Diploid	Mid-Late	Valley Seeds	3
Jivet	275	152	106	102	111	Nil	Tetraploid	Late	DLF Seeds	9
Loader	269	149	98	104	116	Nil	Tetraploid	Late	S&W Seed Company	3
Adrenalin 2	252	149	111	100	107	Nil	Tetraploid	Late	RAGT	10
Rozen	224	147	104	101	108	Nil	Diploid	Late	RAGT	7
Dominator	322	141	115	107	113	Nil	Tetraploid	Late	Tasglobal Seeds	7
Epic	236	140	104	104	110	Nil	Diploid	Mid-Late	AGF Seeds	4
Apex 2	280	134	122	102	108	Nil	Tetraploid	Late	AGF Seeds	4
Apex	198	129	113	102	105	Nil	Tetraploid	Late	AGF Seeds	11
Atomic	159	116	109	100	111	Nil	Tetraploid	Mid	Upper Murray Seeds	5
Vortex	227	109	110	109	116	Nil	Tetraploid	Mid-Late	Barenbrug Australia	5
Tetila	0	100	100	100	100	Nil	Tetraploid	Early	Various	18
Dargo	-122	50	111	104	94	Nil	Diploid	Early	Various	5

Disclaimer

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Dairy Australia Limited ABN 60 105 227 987
 E enquiries@dairyaustralia.com.au
 T +61 3 9694 3777
 F +61 3 9694 3701
 dairyaustralia.com.au