

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

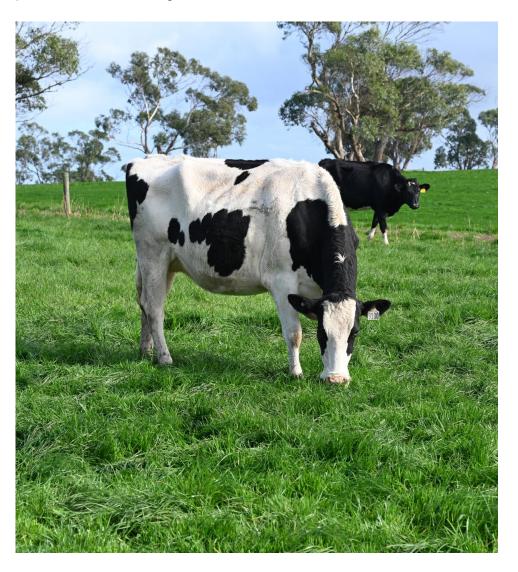
The accompanying tables of cultivar performance during the various FVI seasons are of particular importance to dairy farmers, depending upon their farming system and calving pattern. For example, dairy farmers that calve in the autumn might favour those cultivars that have a higher performance value 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.



Northern Victoria: Forage Value Index 2024 - ANNUAL RYEGRASS

		FVI	Total		Early	Late						Nthn Vic
Cultivar		Nthn Vic	trials	Winter	spring	spring	Summer	Endophyte	Ploidy	Heading date	Marketer	trials
Hogan		391	13	110	105	116	176	Nil	Tetraploid	Late	Barenbrug Australia	2
WinterStar II		373	6	107	109	121	161	Nil	Tetraploid	Late	DLF Seeds	3
Torpedo LM		370	3	116	105	111	170	Nil	Tetraploid	Late	Upper Murray Seeds	0
Zoom		361	7	117	106	114	160	Nil	Tetraploid	Late	Cropmark Seeds	2
Bullet		327	3	106	103	110	173	Nil	Tetraploid	Late	Notman Pasture Seeds	1
Mach 1		312	17	112	105	111	156	Nil	Tetraploid	Mid	DLF Seeds	4
Ascend		308	18	107	102	117	158	Nil	Tetraploid	Mid	DLF Seeds	4
Pinnacle		291	17	108	104	109	160	Nil	Tetraploid	Late	AGF Seeds/(RAGT in WA only)	3
Dominator		290	7	115	107	113	141	Nil	Tetraploid	Late	Tasglobal Seeds	1
Fuze		289	12	100	103	112	166	Nil	Diploid	Late	Barenbrug Australia	3
Speedyl		284	13	107	105	110	156	Nil	Tetraploid	Late	RAGT	2
Jivet		256	9	106	102	111	152	Nil	Tetraploid	Late	DLF Seeds	2
Apex 2		252	4	122	102	108	134	Nil	Tetraploid	Late	AGF Seeds	0
Loader		248	3	98	104	116	149	Nil	Tetraploid	Late	S&W Seed Company	0
Adrenalin 2		236	10	111	100	107	149	Nil	Tetraploid	Late	RAGT	2
Dash		225	9	94	94	111	170	Nil	Tetraploid	Very Late	Cropmark Seeds	2
Epic		216	4	104	104	110	140	Nil	Diploid	Mid-Late	AGF Seeds	1
Rozen		210	7	104	101	108	147	Nil	Diploid	Late	RAGT	1
Buster		195	3	94	97	111	156	Nil	Diploid	Mid-Late	Valley Seeds	0
Vortex		193	5	110	109	116	109	Nil	Tetraploid	Mid-Late	Barenbrug Australia	1
Apex		181	11	113	102	105	129	Nil	Tetraploid	Late	AGF Seeds	2
Atomic		141	5	109	100	111	116	Nil	Tetraploid	Mid	Upper Murray Seeds	0
Tetila		0	18	100	100	100	100	Nil	Tetraploid	Early	Various	4
Dargo		-126	5	111	104	94	50	Nil	Diploid	Early	Various	2

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), Kiewa 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 postilion 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 (Southwest 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

Northern Victoria winter seasonal performance – ANNUAL RYEGRASS

Cultivar	FVI Nthn '	/ic Winte	r Early s	pring Late sprin	ng Summer	Endophyte	Ploidy	Heading date	Marketer	Total trials
Apex 2	25	52 12:	2 102	108	134	Nil	Tetraploid	Late	AGF Seeds	4
Zoom	3	51 11	7 106	114	160	Nil	Tetraploid	Late	Cropmark Seeds	7
Torpedo LM	37	O 11	5 105	111	170	Nil	Tetraploid	Late	Upper Murray Seeds	3
Dominator	29	0 11	5 107	113	141	Nil	Tetraploid	Late	Tasglobal Seeds	7
Apex	1:	31 11:	3 102	105	129	Nil	Tetraploid	Late	AGF Seeds	11
Mach 1	3	12 11:	2 105	111	156	Nil	Tetraploid	Mid	DLF Seeds	17
Adrenalin 2	23	36 11	1 100	107	149	Nil	Tetraploid	Late	RAGT	10
Dargo	-12	26 11	1 104	94	50	Nil	Diploid	Early	Various	5
Hogan	31	91 110	105	116	176	Nil	Tetraploid	Late	Barenbrug Australia	13
Vortex	19	93 110	109	116	109	Nil	Tetraploid	Mid-Late	Barenbrug Australia	5
Atomic	1.	41 109	9 100	111	116	Nil	Tetraploid	Mid	Upper Murray Seeds	5
Pinnacle	2'	91 108	3 104	109	160	Nil	Tetraploid	Late	AGF Seeds/(RAGT in WA only)	17
WinterStar II	37	'3 10°	7 109	121	161	Nil	Tetraploid	Late	DLF Seeds	6
Ascend	30	10	7 102	117	158	Nil	Tetraploid	Mid	DLF Seeds	18
Speedyl	28	4 10	7 105	110	156	Nil	Tetraploid	Late	RAGT	13
Jivet	25	66 10	5 102	111	152	Nil	Tetraploid	Late	DLF Seeds	9
Bullet	32	27 10	5 103	110	173	Nil	Tetraploid	Late	Notman Pasture Seeds	3
Epic	2	104	4 104	110	140	Nil	Diploid	Mid-Late	AGF Seeds	4
Rozen	21	0 104	4 101	108	147	Nil	Diploid	Late	RAGT	7
Fuze	28	39 100	103	112	166	Nil	Diploid	Late	Barenbrug Australia	12
Tetila		0 100	100	100	100	Nil	Tetraploid	Early	Various	18
Loader	24	8 98	3 104	116	149	Nil	Tetraploid	Late	S&W Seed Company	3
Buster	19	94	ý ₊ 97	111	156	Nil	Diploid	Mid-Late	Valley Seeds	3
Dash	22	25 94	ý 94	111	170	Nil	Tetraploid	Very Late	Cropmark Seeds	9

Northern Victoria early spring seasonal performance – ANNUAL RYEGRASS

Cultivar	FVI Nthn Vic	Early spri	ng Late spring	Summer	Winter	Endophyte	Ploidy	Heading date	Marketer	Total trials
Vortex	193	109	116	109	110	Nil	Tetraploid	Mid-Late	Barenbrug Australia	5
WinterStar II	373	109	121	161	107	Nil	Tetraploid	Late	DLF Seeds	6
Dominator	290	107	113	141	115	Nil	Tetraploid	Late	Tasglobal Seeds	7
Zoom	361	106	114	160	117	Nil	Tetraploid	Late	Cropmark Seeds	7
Hogan	391	105	116	176	110	Nil	Tetraploid	Late	Barenbrug Australia	13
Speedyl	284	105	110	156	107	Nil	Tetraploid	Late	RAGT	13
Mach 1	312	105	111	156	112	Nil	Tetraploid	Mid	DLF Seeds	17
Torpedo LM	370	105	111	170	116	Nil	Tetraploid	Late	Upper Murray Seeds	3
Pinnacle	291	104	109	160	108	Nil	Tetraploid	Late	AGF Seeds/(RAGT in WA only)	17
Epic	216	104	110	140	104	Nil	Diploid	Mid-Late	AGF Seeds	4
Loader	248	104	116	149	98	Nil	Tetraploid	Late	S&W Seed Company	3
Dargo	-126	104	94	50	111	Nil	Diploid	Early	Various	5
Bullet	327	103	110	173	106	Nil	Tetraploid	Late	Notman Pasture Seeds	3
Fuze	289	103	112	166	100	Nil	Diploid	Late	Barenbrug Australia	12
Apex 2	252	102	108	134	122	Nil	Tetraploid	Late	AGF Seeds	4
Ascend	308	102	117	158	107	Nil	Tetraploid	Mid	DLF Seeds	18
Apex	181	102	105	129	113	Nil	Tetraploid	Late	AGF Seeds	11
Jivet	256	102	111	152	106	Nil	Tetraploid	Late	DLF Seeds	9
Rozen	210	101	108	147	104	Nil	Diploid	Late	RAGT	7
Atomic	141	100	111	116	109	Nil	Tetraploid	Mid	Upper Murray Seeds	5
Adrenalin 2	236	100	107	149	111	Nil	Tetraploid	Late	RAGT	10
Tetila	0	100	100	100	100	Nil	Tetraploid	Early	Various	18
Buster	195	97	111	156	94	Nil	Diploid	Mid-Late	Valley Seeds	3
Dash	225	94	111	170	94	Nil	Tetraploid	Very Late	Cropmark Seeds	9

Northern Victoria late spring seasonal performance – ANNUAL RYEGRASS

Cultivar	FVI Nthn Vic	Late spring	Summer	Winter	Early spring	Endophyte	Ploidy	Heading date	Marketer	Total trials
WinterStar II	373	121	161	107	109	Nil	Tetraploid	Late	DLF Seeds	6
Ascend	308	117	158	107	102	Nil	Tetraploid	Mid	DLF Seeds	18
Vortex	193	116	109	110	109	Nil	Tetraploid	Mid-Late	Barenbrug Australia	5
Loader	248	116	149	98	104	Nil	Tetraploid	Late	S&W Seed Company	3
Hogan	391	116	176	110	105	Nil	Tetraploid	Late	Barenbrug Australia	13
Zoom	361	114	160	117	106	Nil	Tetraploid	Late	Cropmark Seeds	7
Dominator	290	113	141	115	107	Nil	Tetraploid	Late	Tasglobal Seeds	7
Fuze	289	112	166	100	103	Nil	Diploid	Late	Barenbrug Australia	12
Mach 1	312	111	156	112	105	Nil	Tetraploid	Mid	DLF Seeds	17
Dash	225	111	170	94	94	Nil	Tetraploid	Very Late	Cropmark Seeds	9
Jivet	256	111	152	106	102	Nil	Tetraploid	Late	DLF Seeds	9
Torpedo LM	370	111	170	116	105	Nil	Tetraploid	Late	Upper Murray Seeds	3
Buster	195	111	156	94	97	Nil	Diploid	Mid-Late	Valley Seeds	3
Atomic	141	111	116	109	100	Nil	Tetraploid	Mid	Upper Murray Seeds	5
Epic	216	110	140	104	104	Nil	Diploid	Mid-Late	AGF Seeds	4
Speedyl	284	110	156	107	105	Nil	Tetraploid	Late	RAGT	13
Bullet	327	110	173	106	103	Nil	Tetraploid	Late	Notman Pasture Seeds	3
Pinnacle	291	109	160	108	104	Nil	Tetraploid	Late	AGF Seeds/(RAGT in WA only)	17
Apex 2	252	108	134	122	102	Nil	Tetraploid	Late	AGF Seeds	4
Rozen	210	108	147	104	101	Nil	Diploid	Late	RAGT	7
Adrenalin 2	236	107	149	111	100	Nil	Tetraploid	Late	RAGT	10
Apex	181	105	129	113	102	Nil	Tetraploid	Late	AGF Seeds	11
Tetila	0	100	100	100	100	Nil	Tetraploid	Early	Various	18
Dargo	-126	94	50	111	104	Nil	Diploid	Early	Various	5

Northern Victoria summer seasonal performance – ANNUAL RYEGRASS

Cultivar		FVI Nthn Vic	Summer	Winter	Early spring	Late spring	Endophyte	Ploidy	Heading date	Marketer	Total trials
Hogan		391	176	110	105	116	Nil	Tetraploid	Late	Barenbrug Australia	13
Bullet		327	173	106	103	110	Nil	Tetraploid	Late	Notman Pasture Seeds	3
Torpedo LM		370	170	116	105	111	Nil	Tetraploid	Late	Upper Murray Seeds	3
Dash		225	170	94	94	111	Nil	Tetraploid	Very Late	Cropmark Seeds	9
Fuze		289	166	100	103	112	Nil	Diploid	Late	Barenbrug Australia	12
WinterStar II		373	161	107	109	121	Nil	Tetraploid	Late	DLF Seeds	6
Zoom		361	160	117	106	114	Nil	Tetraploid	Late	Cropmark Seeds	7
Pinnacle		291	160	108	104	109	Nil	Tetraploid	Late	AGF Seeds/(RAGT in WA only)	17
Ascend		308	158	107	102	117	Nil	Tetraploid	Mid	DLF Seeds	18
Speedyl		284	156	107	105	110	Nil	Tetraploid	Late	RAGT	13
Mach 1		312	156	112	105	111	Nil	Tetraploid	Mid	DLF Seeds	17
Buster		195	156	94	97	111	Nil	Diploid	Mid-Late	Valley Seeds	3
Jivet		256	152	106	102	111	Nil	Tetraploid	Late	DLF Seeds	9
Loader		248	149	98	104	116	Nil	Tetraploid	Late	S&W Seed Company	3
Adrenalin 2		236	149	111	100	107	Nil	Tetraploid	Late	RAGT	10
Rozen		210	147	104	101	108	Nil	Diploid	Late	RAGT	7
Dominator		290	141	115	107	113	Nil	Tetraploid	Late	Tasglobal Seeds	7
Epic		216	140	104	104	110	Nil	Diploid	Mid-Late	AGF Seeds	4
Apex 2		252	134	122	102	108	Nil	Tetraploid	Late	AGF Seeds	4
Apex		181	129	113	102	105	Nil	Tetraploid	Late	AGF Seeds	11
Atomic		141	116	109	100	111	Nil	Tetraploid	Mid	Upper Murray Seeds	5
Vortex		193	109	110	109	116	Nil	Tetraploid	Mid-Late	Barenbrug Australia	5
Tetila		0	100	100	100	100	Nil	Tetraploid	Early	Various	18
Dargo		-126	50	111	104	94	Nil	Diploid	Early	Various	5

Disclaimer

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