

Australian National Turfgrass Evaluation Program (ANTEP)

Seeded Couchgrass

Final Report

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ANTEP 4: Seeded Couchgrass

Introduction

The Australian National Turfgrass Evaluation Program (ANTEP) was set up by the Australian Seed Federation (formerly the Seed Industry Association of Australia) in 1997. The main aim of ANTEP is to evaluate a range of turfgrass varieties under uniform maintenance practices and assessment criteria at different sites around Australia. There have been 3 previous ANTEP trials;

- ANTEP 1 (1998): Perennial Ryegrass (Melbourne & Sydney)
- ANTEP 2 (2002): Tall Fescue (Melbourne & Canberra)
- ANTEP 3 (2006): Perennial Ryegrass & Tall Fescue (Melbourne)

These trials have provided turf managers with useful data on which to make informed decisions on selecting varieties for their particular situation as well as providing an excellent educational resource for turf and horticultural students.

Warm-season grasses such as couchgrass (*Cynodon dactylon*) & kikuyugrass (*Pennisetum clandestinum*) are more efficient water users and have better drought tolerance than the cool-season grasses such as ryegrass (*Lolium perenne*), fescue (*Festuca sp.*) as well as Wintergrass (*Poa annua*) which have been traditionally used in sportsfields and on golf course fairways. A saving of approximately 40 to 50% in water use can be achieved with warm-season grasses compared to cool-season grasses and if the turf area is not being actively used over summer then the water savings may even be greater.

Another advantage of warm-season grasses is that without an adequate supply of water (e.g. under water restrictions), sports surfaces consisting predominantly of cool-season grasses will lose cover, become tufty, have excessive hardness and often become unsafe. Warm-season grasses have a greater capacity to maintain good density and have a creeping growth habit that is less likely to become tufty during periods of extreme heat and low rainfall.

With the recent drought and water restrictions limiting the number of sports surfaces that can be watered many Municipal Councils have converted their sportsfields to warm season-grasses. In cold environments or in situations with heavy winter use the playing surface is oversown in autumn with ryegrass to provide a winter surface. The ryegrass provides winter colour and prevents the couch and kikuyu from wearing out during the cooler months when it is not actively growing with the ryegrass sprayed out in spring or stressed out during the following summer.

Couchgrass (oversown with ryegrass) is the preferred surface for most premier sports (football, soccer and cricket) due to its finer texture and lower thatch accumulation compared to kikuyu. It is commonly used in many high profile and irrigated sportsfields as well as on golf course fairways and tees. It can be established from vegetative material (e.g. by line planting or broadcast spreading) or from seed. Several of the commonly used couchgrass varieties, for example; Santa Ana, Legend, Conquest etc. can only be grown from vegetative material.

It is more than twice as expensive to establish a sports surface using vegetative material than from seed. This is a major issue for Municipal Councils that may have many sportsfields (often in excess of 50) when they want to convert to warm-season grasses.

For these reasons it was decided that the fourth ANTEP trial would evaluate seeded couchgrasses.

Methodology

- Location:**
- Mount Scopus Memorial College, Burwood, Victoria
 - North east corner of the main oval – an out of play area away from school buildings & outside the boundary line of the oval
- Soil type:**
- Sand profile
- Trial design:**
- Randomised block design with 3 replicates
 - Plot size is 2.0m x 1.5m (3m²)
 - 20 entries (18 seeded & 2 vegetative couchgrasses)
- Varieties:**
- **Advanced Seeds**
La Paloma; SR 9554; Veracruz; Yukon
 - **DLF Seeds**
Dune; Mirage II; IS-CD 10
 - **Heritage Seeds**
BAR 7 CD5; BAR C291-1; Riviera; Herit T2; Transcontinental
 - **PGG – Wrightson**
PSG 9BAN; PST-R60N-Foundation; PST-R6FLT; Sovereign (SWI-1012); SWI 1057; SWI 1070
 - **Vegetative Standards**
Legend; Santa Ana
- Site preparation:**
- The trial area was sprayed with glyphosate, rotary hoed, and levelled
 - The pH was amended to 6.0 - 6.5 (initial pH 5.3) using Dolomite lime
 - Starter fertiliser was incorporated into the profile prior to seeding
 - Starter fertiliser and a granular wetting agent were broadcast over the surface at seeding
- Seeding & Planting:**
- The trial was sown on the 6th January 2010
 - Seeding rates were 10g/m² for bare seed and 20 g/m² for coated seed (adjusted for 100% germination and for a 1:1 coating)
 - Plots were seeded using “shakers” and then lightly raked
 - The two vegetative couchgrasses were “line-planted” (7 rows, 10 - 15cm apart per plot) at a rate of approximately 1m² of washed sod per 20m²
- Maintenance:**
- **Nutrition**
 - A standard fertiliser program based on a low to moderate level of nutrition (1.7 kg N/100m²/year) that closely reflects the maintenance level of the majority of couchgrass sportsfields.
 - Fertiliser applications were made in spring, summer & autumn.
 - **Irrigation**
 - The trial was irrigated on a daily basis for the first 4 weeks and then every second day for the next 3 weeks. Irrigation was then reduced to an as needed basis to prevent wilt.
 - The trial was irrigated under a Water Conservation Plan approved by Yarra Valley Water

- **Mowing**
 - The trial was maintained with a cylinder mower at a height of 20 to 25mm (the same height of cut as the rest of the oval)
- **Pesticides**
 - Post emergent herbicides were applied in winter 2010 (Kerb, propyzamide) and autumn 2011 & 2012 (Coliseum, rimsulfuron) for *Poa annua* control

Assessment

Establishment: The trial was assessed during establishment for;

- **Germination:** % of replicates germinated
assessed 6 days after seeding (6 DAS)
- **Vigour:** visual estimate based on ground cover, plant height, maturity and health
assessed 10 days after germination/emergence (16 DAS)
0 = poor and 5 = excellent
- **Turf cover:** visual estimate of ground cover (%) at 4, 8 and 12 weeks

Full Sward: Once full cover was attained the trial was assessed quarterly for a two year period for;

- **Quality:** visual estimate integrating colour, uniformity, density, texture, growth habit and smoothness
0 = poor and 5 = excellent quality
- **Colour:** visual estimate of the inherent colour of the variety
0 = straw white and 5 = very dark green
- **Density:** visual estimate of living plants per unit area
0 = bare ground and 5 = very dense

The quarterly assessments were undertaken during;

- Winter: late July
- Spring: late October
- Summer: late January
- Autumn: late April

Wear: Wear was applied during the 2011 football season (ie. the second year). Most newly seeded/planted warm-season grassed sportsfields are not used during their first year.

Wear (4 passes/week) was applied from early April to mid September using a modified walk behind mower that had studs on the back roller & rubber beaters on the cutting unit. Approximately 20% of each plot was worn.

The level of visual cover of the worn section was assessed at the start of football season (early April), middle of winter (late July) and at the end of the football season (late August) as well as during its recovery in late September and late October.

0 = no cover/completely worn away and 5 = full cover

Colour retention / Dormancy & Green Up: The trial was assessed regularly from late April to mid June for colour retention / dormancy and from late August to late October for green-up each year.
0 = none / completely straw white and 5 = completely green

Rainfall, minimum & maximum air temperature and the soil temperature at 10cm depth were also recorded and are summarised in appendix 1.

Statistical Analysis

Analysis of variance was used to compare varieties and the Least Significant Difference (LSD) calculated. The LSD is used to determine statistical differences between varieties by subtracting one variety's mean from another variety's mean. Statistical differences occur when this value is larger than the corresponding LSD value.

At each assessment, varieties that are in the top grouping of significance have been shaded to assist in identifying the better performing varieties - the shaded varieties are not statistically different from each other.

Key Observations

Establishment assessments

- Germination was evident in approximately half of the varieties 6 days after seeding (table 1). There were 5 varieties where germination of all 3 replicates was evident.
- There was a significant difference in vigour between the varieties 16 days after seeding (table 2).
- There was a significant difference in cover at 4 & 8 weeks after seeding (WAS) (table 3);
 - 4 WAS average cover was 62% (ranged from 20 to 83%)
 - 8 WAS average cover was 92% (ranged from 77 to 98%)
- The seeded varieties generally had better early establishment than the two vegetative varieties;
 - all seeded varieties had significantly greater cover than the vegetative varieties at 4 WAS
 - the majority of seeded varieties (all but two) had significantly greater cover than the vegetative varieties at 8 WAS.
- There was no significant difference in cover at 12 WAS with all varieties having greater than 90% cover.

Full sward assessments

- The two vegetative couchgrasses; Santa Ana & Legend are proven performers and in this trial Santa Ana generally performed better than Legend (tables 4 to 6).
- There were a number of seeded varieties that performed as well as the two vegetative varieties.
- The performance of a variety can change during the year and this has implications when selecting a variety. For example if you require a variety to perform well during the football season then its summer performance will be of less importance than its performance during autumn and winter.

Dormancy & green up assessments

- Santa Ana had significant earlier green up than the other varieties in Year 1 but not Year 2 where there were only minimal differences between varieties with respect to green up (tables 8 & 10).
- The imposition of wear during the “football season” in Year 2 delayed green up (tables 10a & 10b).
- Santa Ana retained colour longer than the other varieties going in to dormancy in both years (tables 9 & 11)
- There were two seeded varieties in Year 1 and one variety in Year 2 that retained colour for about 3 weeks longer than the rest of the seeded varieties. However the varieties that retained colour longer were different in each year.

Wear assessments

- There was no difference in cover under wear until late August where 5 varieties (including Santa Ana & Legend) were in the top grouping of significance (table 7).
- By late October (6 weeks after wear ceased) there were 12 varieties that had basically fully recovered (90 – 100% cover). The remaining varieties had around 80% cover.

Care must be taken when using these results as a variety's performance may vary from one location to another, from one year to another and in different soil types.

Acknowledgements

Thanks to Mount Scopus Memorial College for hosting and maintaining the trial site and to Nuturf for providing the fertiliser.

Results

Table 1: Germination (% replicates germinated)

Variety	6 DAS
DUNE	100%
LA PALOMA	100%
SR 9554	100%
TRANSCONTINENTAL	100%
YUKON	100%
MIRAGE II	67%
PST-R60N	67%
PST-R6FLT	67%
RIVIERA	33%
SOVEREIGN	33%
BAR 7 CD5	0%
BAR C291-1	0%
HERIT T2	0%
IS-CD 10	0%
PSG 9BAN	0%
SWI 1057	0%
SWI 1070	0%
VERACRUZ	0%
LEGEND	-
SANTA ANA	-
LSD (p<0.05)	52%

DAS = Days after seeding

Table 2: Vigour (16 days after seeding/planting)

Variety	16 DAS
SR 9554	4.5
DUNE	4.0
TRANSCONTINENTAL	3.8
LA PALOMA	3.7
MIRAGE II	3.3
PST-R60N	3.3
PST-R6FLT	3.3
LEGEND	3.0
SANTA ANA	3.0
SWI 1070	3.0
SOVEREIGN	2.7
YUKON	2.3
HERIT T2	2.0
PSG 9BAN	2.0
BAR C291-1	1.8
BAR 7 CD5	1.3
SWI 1057	1.2
IS-CD 10	1.0
VERACRUZ	1.0
RIVIERA	0.7
LSD (p<0.05)	1.1

0 = poor to 5 = excellent

Table 3: Turf Cover (%)

Variety	4 WAS	8 WAS	12 WAS
PST-R60N	80	97	100
HERIT T2	67	97	100
PST-R6FLT	73	95	100
MIRAGE II	77	93	100
SWI 1057	57	92	100
DUNE	73	98	98
SR 9554	83	97	98
TRANSCONTINENTAL	77	97	98
SWI 1070	72	97	98
LA PALOMA	80	95	98
IS-CD 10	60	95	98
SOVEREIGN	82	97	97
VERACRUZ	62	93	97
PSG 9BAN	53	93	97
BAR C291-1	65	92	97
RIVIERA	40	90	97
BAR 7 CD5	45	82	97
YUKON	52	80	95
LEGEND	28	77	95
SANTA ANA	20	77	93
LSD (p<0.05)	27	8	ns

WAS = Weeks after seeding

Table 4: Quality

Variety	Winter 2010	Spring 2010	Summer 2011	Autumn 2011	Winter 2011	Spring 2011	Summer 2012	Autumn 2012	Average Year 1	Average Year 2	Average
SANTA ANA	3.8	4.3	3.7	4.5	4.2	3.5	4.5	4.3	4.1	4.1	4.1
SWI 1057	3.2	4.0	4.0	4.0	3.3	4.3	4.5	4.3	3.8	4.1	4.0
SWI 1070	3.3	3.5	4.0	4.3	3.3	4.2	4.3	4.5	3.8	4.1	3.9
VERACRUZ	3.3	3.7	3.5	4.3	3.5	4.3	4.3	4.3	3.7	4.1	3.9
RIVIERA	3.2	4.0	3.7	3.8	2.7	4.3	4.3	4.2	3.7	3.9	3.8
HERIT T2	3.5	3.2	4.0	4.0	3.2	4.0	4.0	4.2	3.7	3.8	3.8
LEGEND	3.0	3.3	4.3	4.0	3.3	4.0	4.0	4.0	3.7	3.8	3.8
PSG 9BAN	3.2	3.7	3.5	4.0	2.8	4.5	4.3	3.8	3.6	3.9	3.7
BAR C291-1	3.0	3.3	4.0	4.2	2.8	4.5	4.2	3.8	3.6	3.8	3.7
BAR 7 CD5	2.7	3.3	3.8	3.8	2.8	4.2	4.0	3.5	3.4	3.6	3.5
MIRAGE II	3.0	2.8	3.2	3.8	2.7	4.0	4.3	4.0	3.2	3.8	3.5
SOVEREIGN	2.8	2.5	3.3	3.8	2.7	4.2	4.3	4.0	3.1	3.8	3.5
IS-CD 10	2.2	3.2	3.5	4.0	2.5	4.0	4.2	4.0	3.2	3.7	3.4
PST-R6FLT	3.0	2.3	3.2	3.7	2.5	3.7	4.0	3.8	3.0	3.5	3.3
PST-R60N	2.2	2.0	3.3	4.0	3.0	3.7	4.0	3.8	2.9	3.6	3.3
DUNE	2.5	2.3	3.0	3.7	2.7	3.7	4.0	3.7	2.9	3.5	3.2
SR 9554	2.2	2.2	2.5	3.8	2.8	4.0	4.0	3.8	2.7	3.7	3.2
LA PALOMA	2.3	2.0	3.5	3.7	2.3	3.5	4.2	3.8	2.9	3.5	3.2
TRANSCONTINENTAL	2.7	2.2	2.7	3.7	2.3	3.7	4.0	4.0	2.8	3.5	3.1
YUKON	2.0	3.0	3.2	3.7	2.0	3.5	3.8	3.8	3.0	3.3	3.1
LSD (p<0.05)	ns	0.9	0.6	ns	ns	0.5	0.4	ns	0.6	0.4	0.5

Table 5: Colour

Variety	Winter 2010	Spring 2010	Summer 2011	Autumn 2011	Winter 2011	Spring 2011	Summer 2012	Autumn 2012	Average Year 1	Average Year 2	Average
SANTA ANA	2.3	3.5	4.0	4.0	3.5	4.0	4.5	4.0	3.5	4.0	3.5
SWI 1057	1.5	3.5	4.0	4.2	2.5	4.0	4.5	4.0	3.3	3.8	3.3
LEGEND	1.0	3.5	4.5	4.0	2.2	4.0	4.5	4.0	3.3	3.7	3.3
RIVIERA	1.5	3.5	3.5	4.0	2.3	4.0	4.5	4.0	3.1	3.7	3.1
VERACRUZ	1.5	3.5	3.5	4.0	2.3	4.0	4.5	4.0	3.1	3.7	3.1
HERIT T2	1.2	3.5	3.8	4.0	1.8	4.0	4.5	4.0	3.1	3.6	3.1
SWI 1070	1.2	3.5	3.5	4.0	2.3	4.0	4.5	4.0	3.0	3.7	3.0
PSG 9BAN	1.0	3.5	3.7	4.0	1.5	4.0	4.5	4.0	3.0	3.5	3.0
BAR C291-1	0.7	3.5	3.8	4.0	1.3	4.0	4.5	4.0	3.0	3.5	3.0
MIRAGE II	0.8	3.5	3.5	4.0	2.0	4.0	4.5	4.0	3.0	3.6	3.0
PST-R6FLT	0.5	3.5	3.7	4.0	1.8	4.0	4.5	4.0	2.9	3.6	2.9
IS-CD 10	0.7	3.5	3.5	4.0	1.7	4.0	4.5	4.0	2.9	3.5	2.9
BAR 7 CD5	0.2	3.5	4.0	4.0	1.5	4.0	4.5	4.0	2.9	3.5	2.9
TRANSCONTINENTAL	0.5	3.5	3.5	4.0	2.2	4.0	4.5	4.0	2.9	3.7	2.9
DUNE	0.5	3.5	3.5	4.0	1.8	4.0	4.5	4.0	2.9	3.6	2.9
LA PALOMA	0.5	3.5	3.5	4.0	1.7	4.0	4.5	4.0	2.9	3.5	2.9
YUKON	0.0	3.5	4.0	4.0	1.5	4.0	4.5	4.0	2.9	3.5	2.9
SOVEREIGN	0.3	3.5	3.5	4.0	2.0	4.0	4.5	4.0	2.8	3.6	2.8
SR 9554	0.2	3.5	3.5	4.0	1.8	4.0	4.5	4.0	2.8	3.6	2.8
PST-R60N	0.0	3.5	3.5	4.0	2.0	4.0	4.5	4.0	2.8	3.6	2.8
LSD (p<0.05)	0.9	ns	0.2	ns	ns	ns	ns	ns	0.2	ns	0.2

Table 6: Density

Variety	Winter 2010	Spring 2010	Summer 2011	Autumn 2011	Winter 2011	Spring 2011	Summer 2012	Autumn 2012	Average Year 1	Average Year 2	Average
SANTA ANA	3.0	5.0	4.5	4.8	4.7	4.2	4.5	5.0	4.3	4.6	4.5
SWI 1070	2.8	3.7	4.0	4.2	3.8	4.5	4.5	4.7	3.7	4.4	4.0
HERIT T2	2.7	3.5	4.5	3.7	4.2	4.3	4.3	4.7	3.6	4.4	4.0
SWI 1057	2.5	3.7	4.2	4.2	3.8	4.3	4.3	4.8	3.6	4.3	4.0
VERACRUZ	2.5	3.7	4.2	4.0	3.8	4.3	4.5	4.7	3.6	4.3	4.0
RIVIERA	2.7	3.8	3.8	4.0	3.7	4.3	4.3	4.3	3.6	4.2	3.9
BAR C291-1	2.2	3.5	4.0	4.0	3.7	4.3	4.3	4.5	3.4	4.2	3.8
LEGEND	1.8	3.3	4.5	3.8	4.0	4.2	4.2	4.5	3.4	4.2	3.8
PSG 9BAN	2.7	3.5	3.8	3.7	3.5	4.5	4.3	4.3	3.4	4.2	3.8
IS-CD 10	2.0	3.5	3.7	3.8	3.8	4.0	4.5	4.3	3.3	4.2	3.7
BAR 7 CD5	2.0	3.2	3.8	3.8	3.2	4.0	4.2	3.8	3.2	3.8	3.5
SOVEREIGN	1.8	2.2	3.7	3.7	3.2	4.0	4.5	4.0	2.8	3.9	3.4
MIRAGE II	2.0	2.5	3.3	3.7	3.0	4.0	4.2	4.2	2.9	3.8	3.4
PST-R6FLT	2.3	1.8	3.5	3.8	3.2	3.8	4.3	4.0	2.9	3.8	3.4
YUKON	1.8	3.2	3.5	3.5	3.2	3.5	4.0	4.0	3.0	3.7	3.3
PST-R60N	1.2	1.8	3.5	3.8	3.8	3.5	4.2	4.2	2.6	3.9	3.3
DUNE	2.2	1.8	3.7	3.8	3.0	3.8	4.2	3.5	2.9	3.6	3.3
TRANSCONTINENTAL	1.7	1.7	3.0	3.7	3.0	3.7	4.0	4.0	2.5	3.7	3.1
SR 9554	1.3	1.2	2.8	3.8	3.3	3.8	4.0	4.2	2.3	3.8	3.1
LA PALOMA	1.7	1.7	3.0	3.7	3.2	3.5	4.2	3.7	2.5	3.6	3.1
LSD (p<0.05)	ns	1.2	0.6	ns	0.9	0.4	ns	0.8	0.7	0.5	0.6

Table 7: Cover under wear

Variety	Early Apr.	Late Jul.	Late Aug.	Late Sep.	Late Oct.
BAR C291-1	5.0	2.8	1.3	2.3	5.0
RIVIERA	5.0	3.3	1.7	3.3	5.0
SANTA ANA	5.0	4.3	2.3	3.5	5.0
SWI 1057	5.0	3.7	2.1	2.5	5.0
PSG 9BAN	5.0	3.0	1.6	2.7	4.8
SWI 1070	5.0	3.7	2.2	3.5	4.8
MIRAGE II	5.0	2.3	1.4	2.5	4.7
VERACRUZ	5.0	3.7	2.0	2.3	4.7
HERIT T2	5.0	3.2	1.7	2.7	4.5
LEGEND	5.0	2.8	1.7	2.5	4.5
IS-CD 10	5.0	3.0	1.5	2.0	4.3
SOVEREIGN	5.0	2.8	1.5	2.2	4.3
BAR 7 CD5	5.0	3.7	1.9	2.2	4.2
DUNE	5.0	3.0	1.3	2.3	4.2
PST-R60N	5.0	3.0	1.4	1.8	4.2
PST-R6FLT	5.0	2.3	1.5	2.5	4.2
SR 9554	5.0	2.2	1.1	1.7	4.2
TRANSCONTINENTAL	5.0	2.5	1.1	1.8	4.0
YUKON	5.0	2.0	1.0	2.0	4.0
LA PALOMA	5.0	2.7	1.2	2.0	3.8
LSD (p<0.05)	ns	ns	0.5	1.1	0.7

Wear applied from early April to mid September

0 = no cover/completely worn and 5 = full cover

Table 8: Green-Up 2010 (Year 1)

VARIETY	30-Aug-10	06-Sep-10	15-Sep-10	27-Sep-10	11-Oct-10	25-Oct-10
SANTA ANA	2.5	2.5	3.2	3.5	5.0	5.0
PSG 9BAN	1.0	1.0	1.3	2.2	4.3	4.7
SWI 1057	1.5	1.5	1.8	2.3	4.2	4.7
VERACRUZ	1.0	1.3	1.5	2.3	4.0	4.5
RIVIERA	1.2	1.2	1.3	2.0	4.0	4.5
MIRAGE II	0.7	1.0	1.3	2.2	3.8	4.5
LEGEND	1.3	1.3	1.8	2.7	3.8	4.3
IS-CD 10	0.7	0.7	0.8	1.5	3.7	4.3
BAR C291-1	0.7	0.8	0.8	1.8	3.8	4.2
BAR 7 CD5	0.7	0.7	0.8	2.0	3.7	4.2
PST-R60N	0.2	0.5	0.8	2.0	3.5	4.2
HERIT T2	1.0	1.0	1.0	1.5	3.5	4.2
SWI 1070	0.8	0.8	0.8	1.7	3.3	3.8
DUNE	0.3	0.3	0.5	1.2	2.5	3.3
SR 9554	0.3	0.3	0.3	1.0	2.3	3.3
SOVEREIGN	0.5	0.7	0.7	1.2	2.5	3.2
LA PALOMA	0.3	0.5	0.5	1.0	2.5	3.2
PST-R6FLT	0.3	0.5	0.5	1.0	2.3	3.2
TRANSCONTINENTAL	0.3	0.3	0.5	1.0	2.2	3.0
YUKON	0.3	0.3	0.3	1.0	2.5	2.8
LSD (p<0.05)	0.5	0.5	0.6	0.8	0.9	0.8
Soil temperature (° C)	10	10	12	14	15	15

Green Up 2010

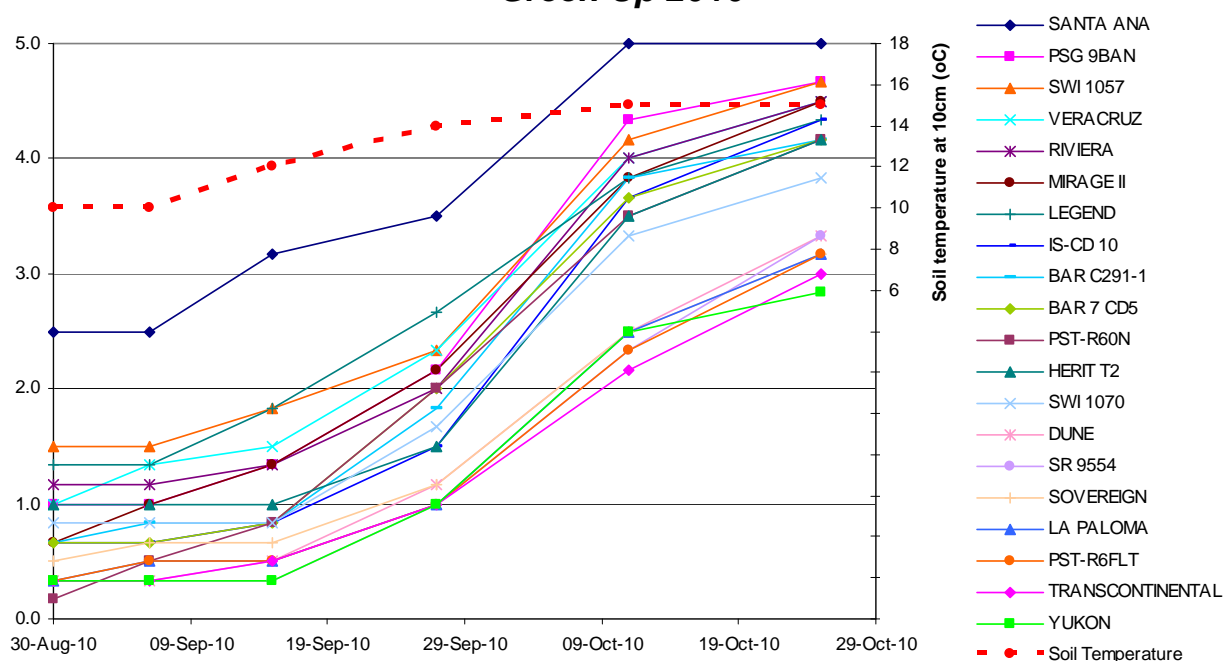


Table 9: Colour Retention / Dormancy 2011 (Year 2)

VARIETY	27-Apr-11	09-May-11	19-May-11	30-May-11	10-Jun-11	22-Jun-11
SANTA ANA	4.7	4.5	4.3	4.0	3.2	2.8
VERACRUZ	4.3	4.2	3.7	3.2	2.2	1.7
LEGEND	3.7	3.5	3.3	2.7	2.0	1.5
SWI 1057	4.0	3.8	3.5	3.0	2.0	1.3
SWI 1070	4.3	4.2	3.8	3.0	1.8	1.3
HERIT T2	3.8	3.7	3.5	3.0	1.5	1.3
RIVIERA	3.8	3.7	3.5	2.7	1.7	1.0
TRANSCONTINENTAL	3.8	3.3	3.0	2.3	1.5	1.0
PST-R6FLT	3.7	3.5	3.0	2.5	1.5	0.8
BAR 7 CD5	4.2	3.3	3.3	2.3	1.3	0.8
SOVEREIGN	3.7	3.5	3.0	2.3	1.3	0.8
SR 9554	3.7	3.5	3.0	2.2	1.3	0.8
PST-R60N	3.8	3.5	3.2	2.5	1.2	0.8
BAR C291-1	4.0	3.5	3.0	2.5	1.2	0.8
PSG 9BAN	3.7	3.3	3.0	2.5	1.2	0.8
IS-CD 10	3.8	3.7	3.3	2.3	1.5	0.7
MIRAGE II	3.3	3.0	3.0	2.3	1.3	0.7
LA PALOMA	3.7	3.5	3.0	2.3	1.2	0.7
YUKON	3.7	3.2	2.8	2.2	1.0	0.7
DUNE	3.3	3.0	2.8	2.0	1.0	0.7
LSD (p<0.05)	0.6	0.5	0.6	0.5	0.5	0.5
Soil temperature (° C)	15	10	11	10	10	10

Colour Retention / Dormancy 2011

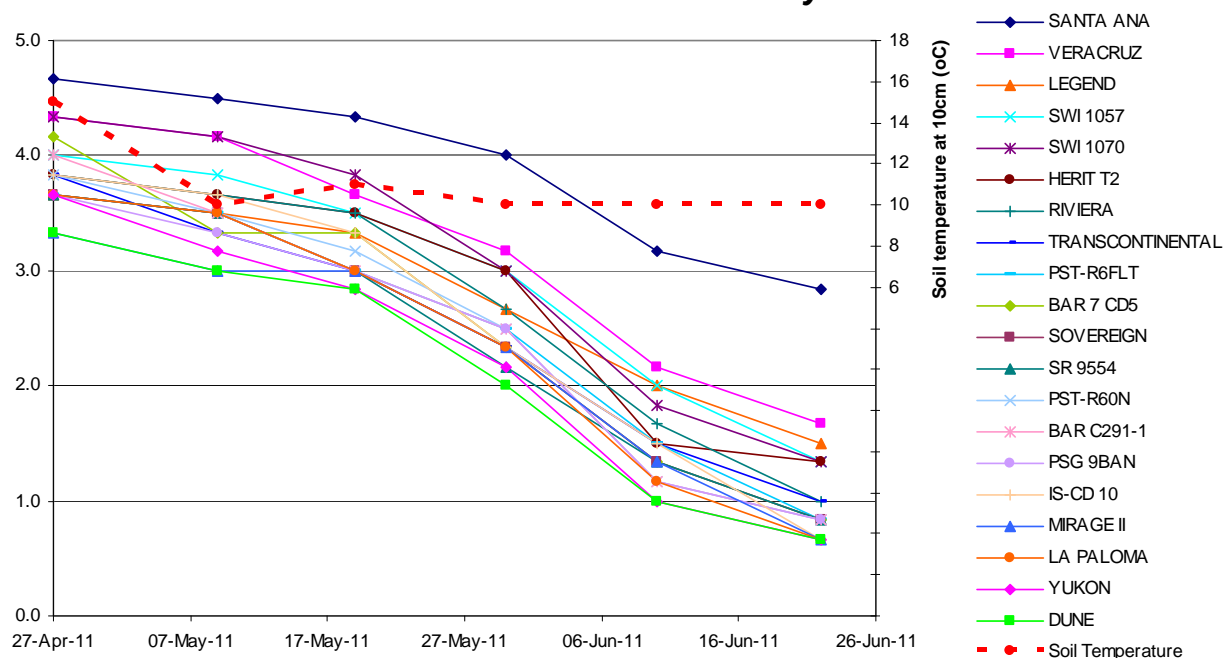


Table 10a: Green-Up - no wear 2011 (Year 2)

VARIETY	29-Aug-11	14-Sep-11	26-Sep-11	10-Oct-11	26-Oct-11
RIVIERA	2.8	3.7	4.7	5.0	5.0
SWI 1070	2.8	3.8	5.0	5.0	5.0
SWI 1057	2.8	3.8	4.8	5.0	5.0
BAR C291-1	2.0	3.2	4.7	5.0	5.0
SANTA ANA	3.2	4.0	5.0	5.0	5.0
VERACRUZ	2.8	3.5	4.7	5.0	5.0
HERIT T2	2.7	3.5	5.0	5.0	5.0
MIRAGE II	2.5	3.5	4.5	4.8	5.0
PST-R6FLT	2.5	3.5	4.8	4.8	5.0
PST-R60N	2.5	3.3	4.7	4.7	5.0
SOVEREIGN	2.3	3.3	4.7	4.7	5.0
IS-CD 10	2.5	3.5	4.5	4.5	5.0
LEGEND	2.5	3.3	4.5	4.5	5.0
SR 9554	2.7	3.5	4.3	4.5	5.0
PSG 9BAN	2.3	3.5	4.5	4.5	5.0
BAR 7 CD5	2.5	3.5	4.3	4.5	5.0
YUKON	2.2	3.0	4.3	4.3	5.0
LA PALOMA	2.2	3.0	4.2	4.3	5.0
DUNE	2.3	3.0	4.3	4.3	5.0
TRANSCONTINENTAL	2.5	3.2	4.3	4.3	5.0
LSD (p<0.05)	ns	ns	ns	0.4	ns
Soil temperature (° C)	10	12	13	12	13

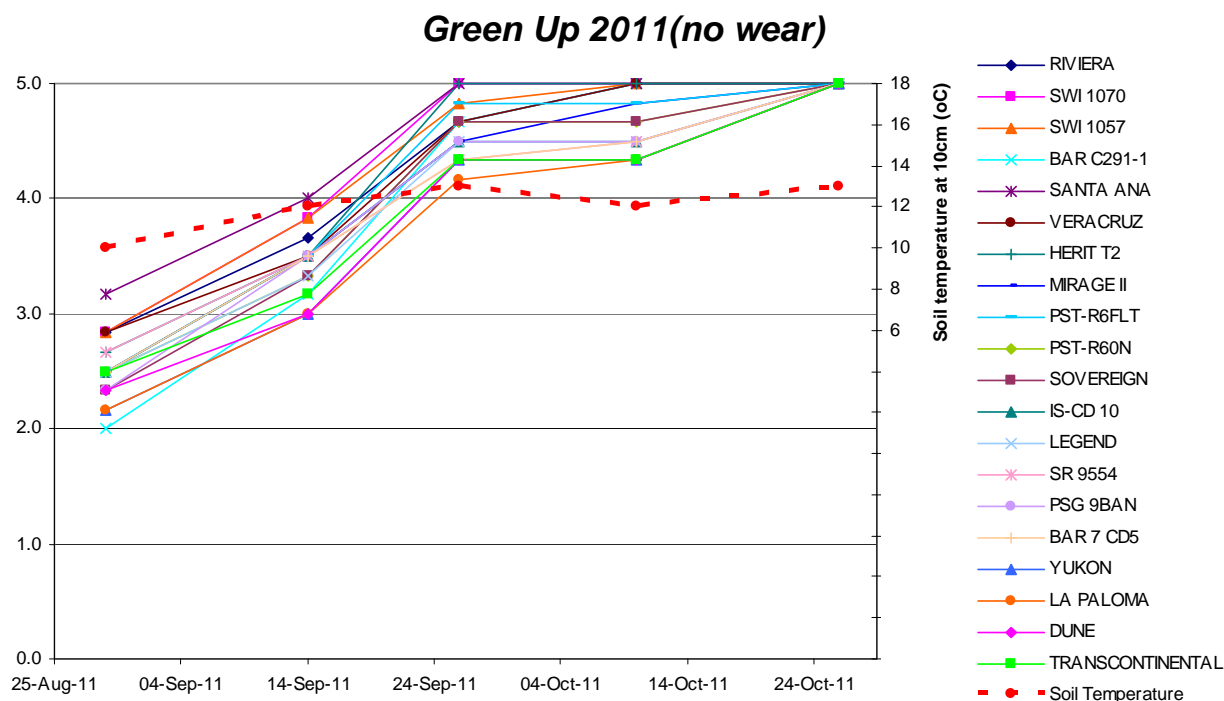


Table 10b: Green-Up - wear 2011 (Year 2)

VARIETY	29-Aug-11	14-Sep-11	26-Sep-11	10-Oct-11	26-Oct-11
SANTA ANA	0.0	2.2	3.5	4.7	5.0
RIVIERA	0.0	2.0	3.3	4.5	5.0
SWI 1057	0.0	1.7	2.5	4.3	5.0
BAR C291-1	0.0	1.2	2.3	4.2	5.0
SWI 1070	0.0	2.2	3.5	4.3	4.8
PSG 9BAN	0.0	1.3	2.7	4.2	4.8
MIRAGE II	0.0	1.5	2.5	4.0	4.7
VERACRUZ	0.0	1.3	2.3	3.8	4.7
LEGEND	0.0	1.7	2.5	4.2	4.5
HERIT T2	0.0	1.5	2.7	4.0	4.5
IS-CD 10	0.0	1.5	2.0	3.7	4.3
SOVEREIGN	0.0	1.5	2.2	3.5	4.3
PST-R6FLT	0.0	1.5	2.5	3.7	4.2
DUNE	0.0	1.5	2.3	3.7	4.2
BAR 7 CD5	0.0	1.3	2.2	3.7	4.2
SR 9554	0.0	1.3	1.7	3.5	4.2
PST-R60N	0.0	1.2	1.8	3.3	4.2
TRANSCONTINENTAL	0.0	1.5	1.8	3.5	4.0
YUKON	0.0	1.3	2.0	3.2	4.0
LA PALOMA	0.0	1.5	2.0	3.3	3.8
LSD (p<0.05)	ns	ns	1.1	0.7	0.7
Soil temperature (° C)	10	12	13	12	13

Green Up 2011(with wear)

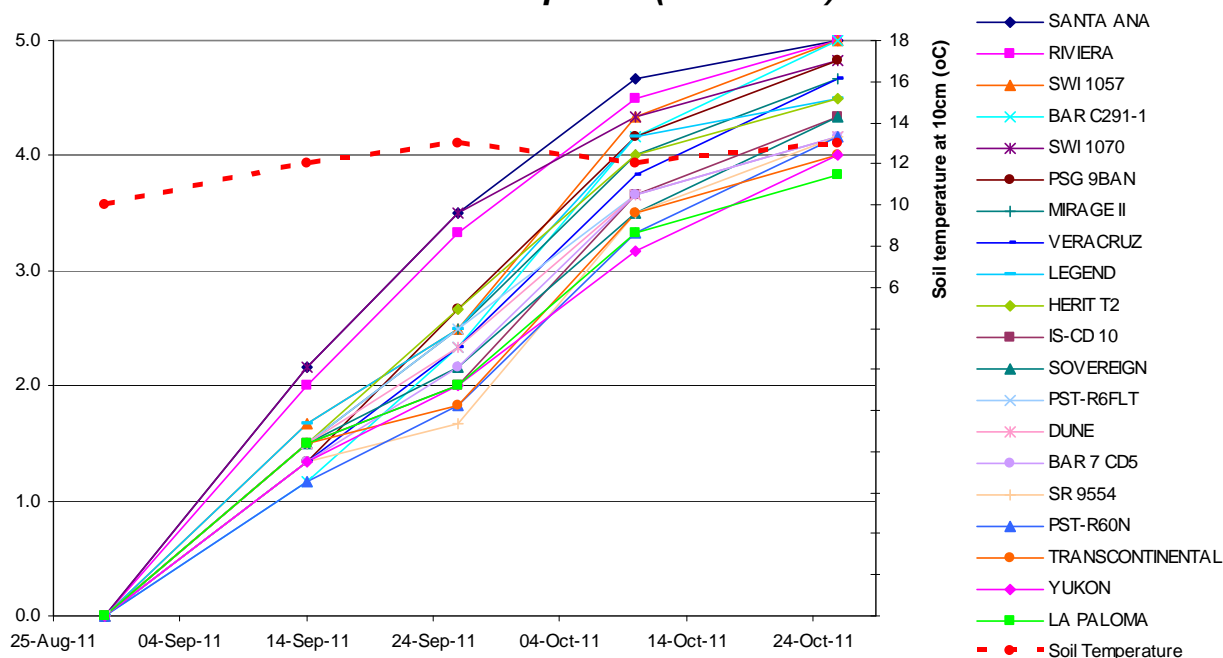
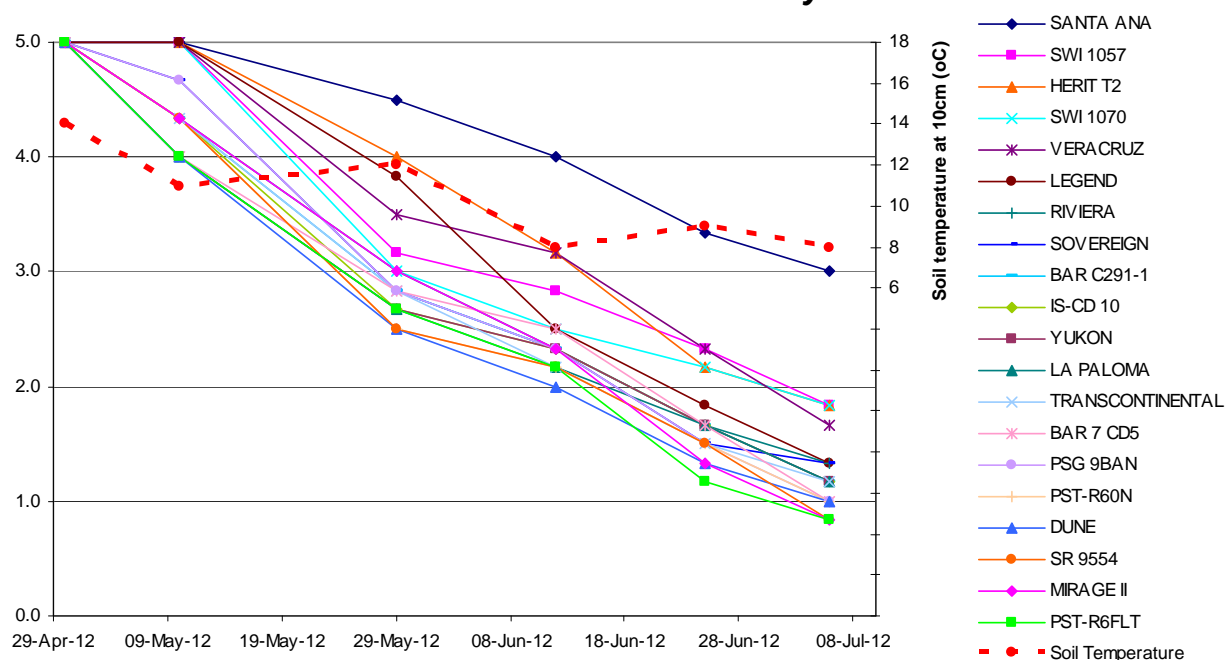


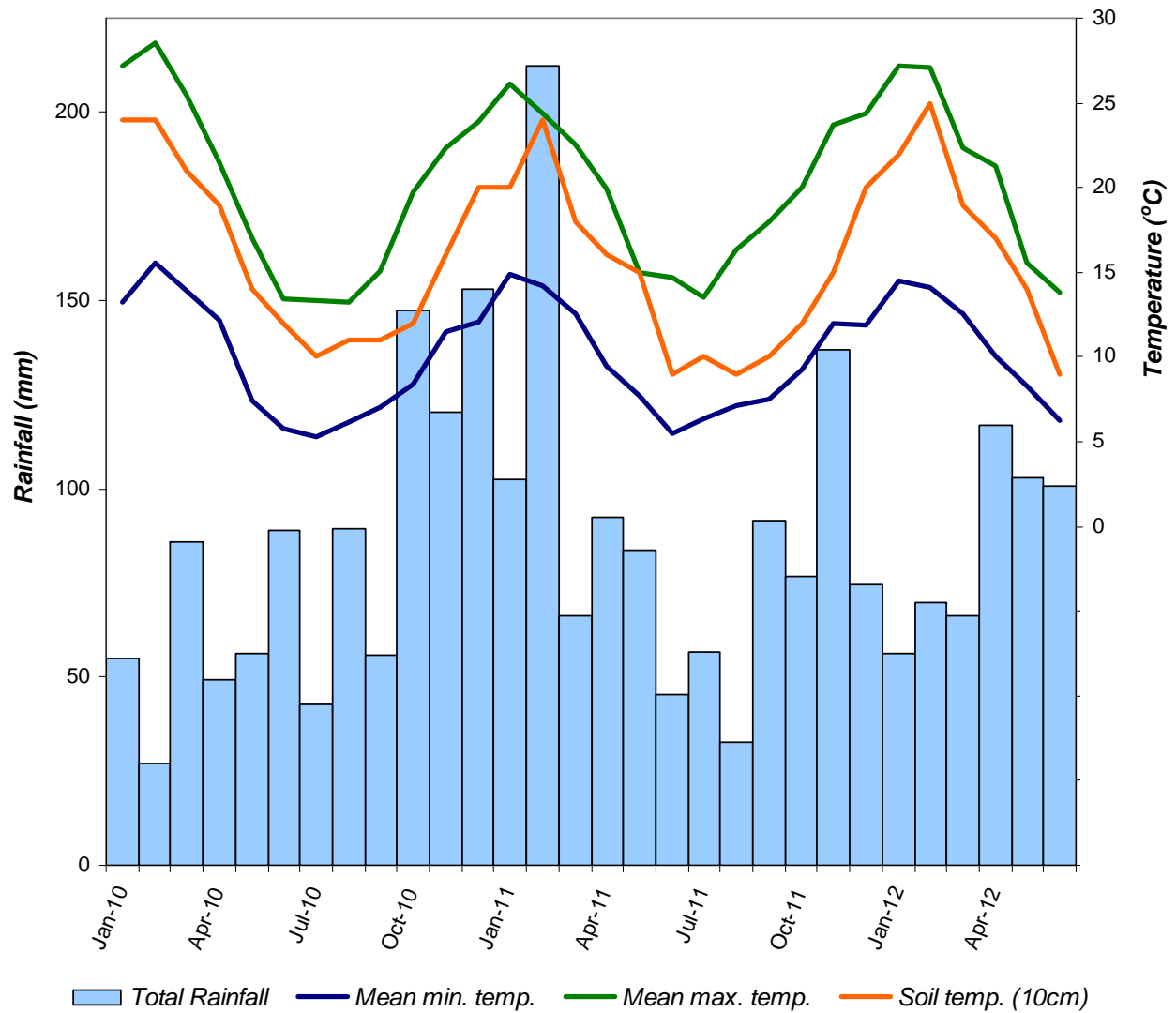
Table 11: Colour Retention / Dormancy 2012 (Year 3)

VARIETY	30-Apr-12	10-May-12	29-May-12	12-Jun-12	25-Jun-12	06-Jul-12
SANTA ANA	5.0	5.0	4.5	4.0	3.3	3.0
SWI 1057	5.0	5.0	3.2	2.8	2.3	1.8
HERIT T2	5.0	5.0	4.0	3.2	2.2	1.8
SWI 1070	5.0	5.0	3.0	2.5	2.2	1.8
VERACRUZ	5.0	5.0	3.5	3.2	2.3	1.7
LEGEND	5.0	5.0	3.8	2.5	1.8	1.3
RIVIERA	5.0	4.3	3.0	2.3	1.7	1.3
SOVEREIGN	5.0	4.7	2.8	2.3	1.5	1.3
BAR C291-1	5.0	4.3	2.8	2.3	1.7	1.2
IS-CD 10	5.0	4.3	2.7	2.3	1.7	1.2
YUKON	5.0	4.0	2.7	2.3	1.7	1.2
LA PALOMA	5.0	4.0	2.7	2.2	1.7	1.2
TRANSCONTINENTAL	5.0	4.3	2.8	2.2	1.5	1.2
BAR 7 CD5	5.0	4.0	2.8	2.5	1.7	1.0
PSG 9BAN	5.0	4.7	2.8	2.3	1.5	1.0
PST-R60N	5.0	4.3	2.5	2.2	1.5	1.0
DUNE	5.0	4.0	2.5	2.0	1.3	1.0
SR 9554	5.0	4.3	2.5	2.2	1.5	0.8
MIRAGE II	5.0	4.3	3.0	2.3	1.3	0.8
PST-R6FLT	5.0	4.0	2.7	2.2	1.2	0.8
LSD (p<0.05)	ns	0.6	0.6	0.5	0.7	0.7
Soil temperature (° C)	14	11	12	8	9	8

Colour Retention / Dormancy 2012



Appendix 1: Trial Weather Conditions



Appendix 2: Trial Photos



Seeding with shakers



Line planting vegetative couchgrasses



Trial overview: 4 weeks after seeding



Trial overview: 8 weeks after seeding



Trial overview: 14 weeks after seeding



Summer



Winter



Spring green-up



Wear in late autumn



Wear machine

Field Day (November 2011)



ANTEP 4 (2010 - 2012)

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