Sugar Research Australia

VARIETY GUIDE 2021/2022

Central Region

HOW TO USE THIS GUIDE

This guide is designed to help growers in the Central canegrowing region with their agronomic considerations when selecting new varieties to plant and trial on their farms. The information comes from the best available data of regional variety performance and disease ratings. ***The information in the tables will help you understand:***

WANT TO KNOW WHAT IS HAPPENING IN THE OTHER REGIONS?

You can find all the regional variety guides on the SRA website ***sugarresearch.com.au***

(Cover page) *Harvesting a variety trial near Oakenden in the Central Region.*

SRA acknowledges the assistance of Central Region Productivity Services Organisations in producing this publication.

NEW AND RECENT VARIETIES AVAILABLE IN THE CENTRAL REGION

Variety Recommendation and Release Process

Regional Variety Committees (RVCs) are responsible for variety release decisions. SRA supports these groups with secretariat support and the provision of technical information to assist the committee making decisions on particular varieties.

RVCs are composed of voting and non-voting members to ensure transparency in the decision making process.

The Central RVC (Sugarcane Biosecurity Zone 3) voting membership consists of one grower representative from Proserpine, Mackay and Plane Creek. Voting representatives from Wilmar and Mackay Sugar also sit on the RVC. The Central RVC requires a majority vote for progression of a variety through the breeding program and a unanimous vote for the release of a variety.

If you would like more information on new variety release and regional variety committees, please visit the SRA website: ***sugarresearch.com.au/growers-and-millers/varieties/regional-variety-committees/***

Presented below are the results of trials conducted in the Central region. Yield (TCH) and CCS for each new variety are compared with the trial results of various standard varieties.

Variety: SRA22Φ		***Parentage:** QS91-7179 x CP72-2086 / **Summary:** Equal tonnes cane; higher CCS*								
TRIAL HARVEST YEAR	**CROP CLASS**	**YIELD (TCH)**				**CCS**				**# OF HARVESTS**
		SRA22Φ	**Q208Φ**	**Q238Φ**	**KQ228Φ**	**SRA22Φ**	**Q208Φ**	**Q238Φ**	**KQ228Φ**	
(2013 series FATs): 2014	Plant	84	78	85	78	16.5	16.2	16.4	15.9	4
2015	1R	97	95	95	89	18.0	17.4	17.6	18.0	4
2016	2R	98	96	94	91	17.1	16.9	16.3	16.9	4
(2016 series FATs): 2017	Plant	77	70	65		17.4	17.8	17.1		3
2018	1R	88	93	87		18.0	17.7	17.5		3
2019	2R	88	86	85		17.4	17.1	16.8		3
Overall performance		**89**	**86**	**85**	*	**17.4**	**17.2**	**17.0**	*	**21**
Comments:		SRA22Φ is a variety that is resistant to Pachymetra and Fiji leaf gall, resistant-intermediate to smut and leaf scald, and intermediate to red rot. It has equal TCH & higher CCS when compared to current commercial cane varieties. *KQ228Φ was only evaluated in the 2013 series FATs and can only be compared against those particular plant and ratoon crops.								

Variety: SRA21Φ		***Parentage:** QC82-663 x Q205Φ / **Summary:** Equal tonnes cane; equal CCS*								
TRIAL HARVEST YEAR	**CROP CLASS**	**YIELD (TCH)**				**CCS**				**# OF HARVESTS**
		SRA21Φ	**Q208Φ**	**Q183Φ**	**Q238Φ**	**SRA21Φ**	**Q208Φ**	**Q183Φ**	**Q238Φ**	
(2011 series FATs): 2012	Plant	107	92	101		16.4	16.9	16.1		4
2013	1R	88	92	92		17.9	18.4	18.1		4
2014	2R	83	87	82		17.4	17.9	17.6		4
(2014 series FATs): 2015	Plant	90	95	89	98	17.5	17.4	17.2	17.2	4
2016	1R	101	104	102	98	16.8	16.8	17.0	16.8	4
2017	2R	80	84	80	80	18.5	18.5	18.3	18.0	4
Overall performance		**92**	**92**	**91**	*	**17.4**	**17.7**	**17.4**	*	**24**
Comments:		SRA21Φ is a variety with resistant-intermediate rating for smut and Pachymetra, and is resistant to leaf scald and Fiji leaf gall. It has equal TCH and CCS compared to current commercial cane varieties. Preliminary tests suggest good sugar early in the season.								

Variety: SRA13Φ		Parentage: QC88-284 x QC90-289 / Summary: Equal tonnes cane; equal CCS								
TRIAL HARVEST YEAR	CROP CLASS	YIELD (TCH)				CCS				# OF HARVESTS
		SRA13Φ	Q208Φ	Q200Φ	Q238Φ	SRA13Φ	Q208Φ	Q200Φ	Q238Φ	
(2012 series FATs): 2013	Plant	93	84	85	88	17.8	17.9	17.5	18.1	3
2014	1R	96	92	86	98	18.0	18.2	17.9	18.2	3
2015	2R	70	72	65	75	18.0	18.1	18.1	17.9	3
(2016 series FATs): 2017	Plant	66	70		65	17.5	17.8		17.1	4
2018	1R	84	93		87	17.5	17.7		17.5	4
2019	2R	81	86		85	16.8	17.1		16.8	4
Overall performance		**82**	**83**	*	**83**	**17.6**	**17.8**	*	**17.6**	**21**
Comments:		SRA13Φ is a variety with intermediate rating for smut, and is resistant to Pachymetra, leaf scald and Fiji leaf gall. It has equal TCH and CCS compared to commercial cane standards. *Q200Φ was only evaluated in the 2012 series FAT and can only be compared against those particular plant and ratoon crops.								

Variety: SRA12Φ		Parentage: Q233Φ x QC90-289 / Summary: Equal tonnes cane; lower CCS								
TRIAL HARVEST YEAR	CROP CLASS	YIELD (TCH)				CCS				# OF HARVESTS
		SRA12Φ	Q208Φ	Q183Φ	Q238Φ	SRA12Φ	Q208Φ	Q183Φ	Q238Φ	
(2011 series FATs): 2012	Plant	108	92	101		15.6	16.9	16.1		4
2013	1R	95	91	92		17.4	18.4	18.1		4
2014	2R	86	87	82		17.1	17.9	17.6		4
(2014 series FATs): 2015	Plant	104	96	89	98	15.4	16.9	16.8	16.7	3
2016	1R	94	104	101	96	14.9	16.6	16.8	16.6	3
2017	2R	76	91	86	87	16.7	18.2	18.1	17.7	3
Overall performance		**94**	**93**	**92**	*	**16.3**	**17.5**	**17.2**	*	**21**
Comments:		SRA12Φ is a variety with intermediate rating for smut, and is resistant to Pachymetra and leaf scald. It has equal TCH & lower CCS when compared to current commercial cane varieties. *Q238Φ was only evaluated in the 2014 series FAT and can only be compared against those particular plant and ratoon crops.								

Variety: SRA9Φ		Parentage: QN81-289 x Q166 / Summary: Higher tonnes cane; lower CCS								
TRIAL HARVEST YEAR	CROP CLASS	YIELD (TCH)				CCS				# OF HARVESTS
		SRA9Φ	Q208Φ	Q200Φ	KQ228Φ	SRA9Φ	Q208Φ	Q200Φ	KQ228Φ	
(2007 series FATs): 2008	Plant	95	90	84	85	16.0	16.7	16.5	16.7	4
2009	1R	80	80	74	75	15.3	16.0	15.8	16.1	4
2010	2R	100	76	68	70	14.6	14.6	14.8	14.4	2
2011	3R	32	33	30	36	14.8	15.4	15.6	15.4	1
(2009 series FATs): 2010	Plant	74	75	74	69	15.1	15.5	15.8	14.9	3
2011	1R	87	82	81	79	15.1	15.3	15.3	15.4	3
2012	2R	87	84	75	71	17.0	17.3	17.0	17.6	3
Overall performance		**83**	**79**	**75**	**74**	**15.6**	**16.0**	**15.9**	**15.9**	**20**
Comments:		SRA9Φ is a variety with intermediate-susceptible rating for smut, and is resistant to Pachymetra and leaf scald. It has higher TCH against current commercial cane varieties. CCS is slightly lower than current standards.								

NEW AND RECENT VARIETIES AVAILABLE IN THE CENTRAL REGION (CONT)

Variety: Q253Φ		Parentage: QN80-3425 x Q209Φ / Summary: Equal tonnes cane; lower CCS								
TRIAL HARVEST YEAR	CROP CLASS	YIELD (TCH)				CCS				# OF HARVESTS
		Q253Φ	Q208Φ	Q240Φ	Q238Φ	Q253Φ	Q208Φ	Q240Φ	Q238Φ	
(2016 series FATs): 2017	Plant	69	70	65	65	17.0	17.8	17.7	17.1	4
2018	1R	95	93	91	87	17.2	17.7	18.0	17.5	4
2019	2R	90	86	85	85	16.6	17.1	17.0	16.8	4
Overall performance		**85**	**83**	**80**	**79**	**16.9**	**17.5**	**17.6**	**17.1**	**12**
Comments:		Q253Φ has equal or higher TCH, lower CCS, and is resistant to smut, Pachymetra, leaf scald, and susceptible to Fiji leaf gall. Q253Φ is also intermediate-susceptible to brown rust.								

Variety: Q250Φ		Parentage: QN79-183 x QN89-1043 / Summary: Equal tonnes cane; higher CCS								
TRIAL HARVEST YEAR	CROP CLASS	YIELD (TCH)				CCS				# OF HARVESTS
		Q250Φ	Q183Φ	Q208Φ	Q238Φ	Q250Φ	Q183Φ	Q208Φ	Q238Φ	
(2013 series FATs): 2014	Plant	86	88	77	85	17.9	17.2	17.1	17.0	3
2015	1R	91	92	94	94	19.4	18.4	18.1	18.3	3
2016	2R	90	91	96	92	17.5	17.6	17.2	16.5	3
Overall performance		**89**	**90**	**89**	**90**	**18.2**	**17.7**	**17.5**	**17.3**	**9**
Comments:		Q250Φ is resistant to smut and leaf scald, intermediate for Pachymetra and susceptible to Fiji leaf gall. Q250Φ has equal TCH & higher CCS when compared to the current standards.								

SRA22[Φ]

SRA21[Φ]

SRA13[Φ]

SRA12[Φ]

SRA9[Φ]

Q253[Φ]

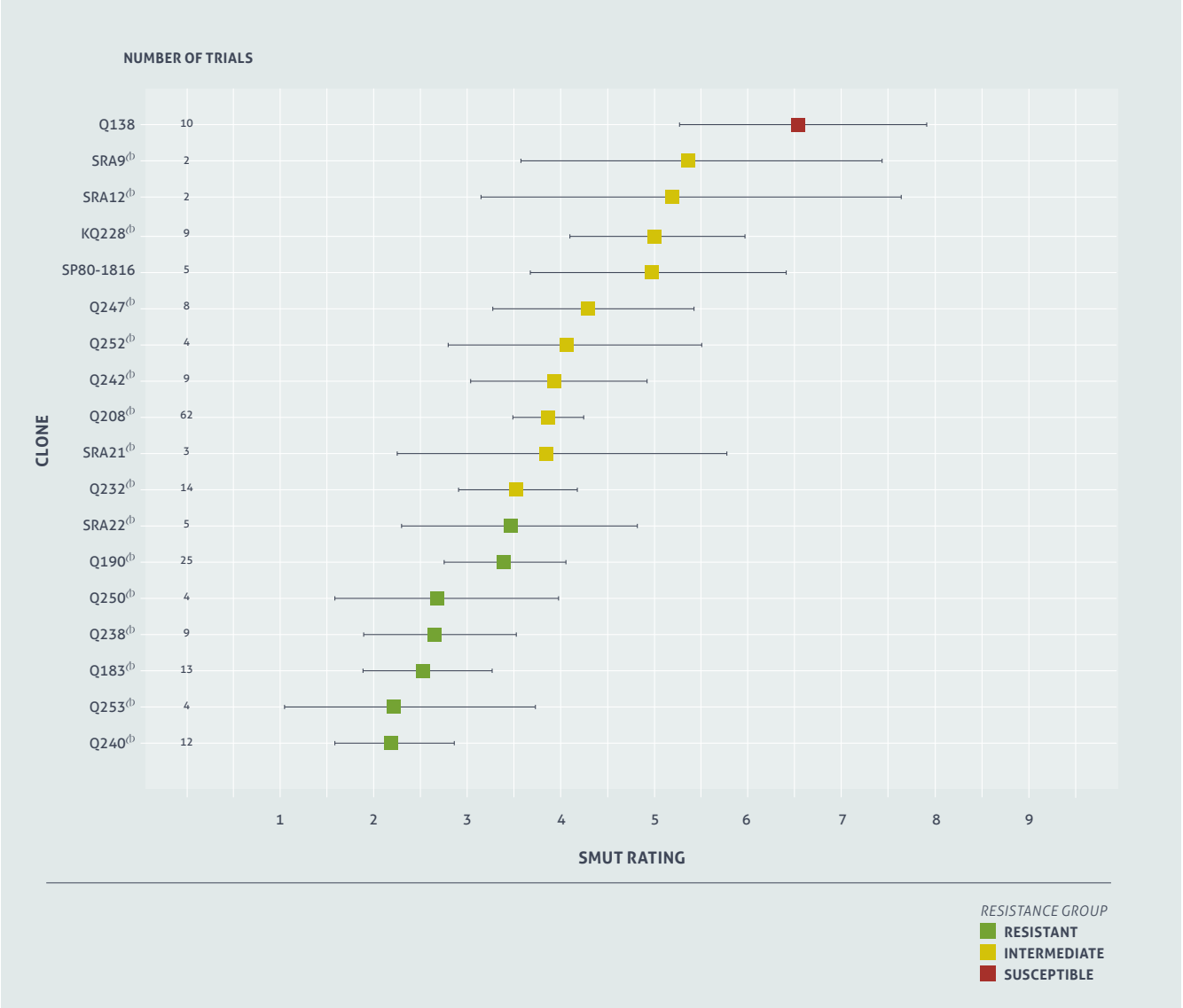
Q250[Φ]

For more information on *variety field trials* contact:

Central Variety Officer Chris Tom
E ctom@sugarresearch.com.au
M 0411 589 806

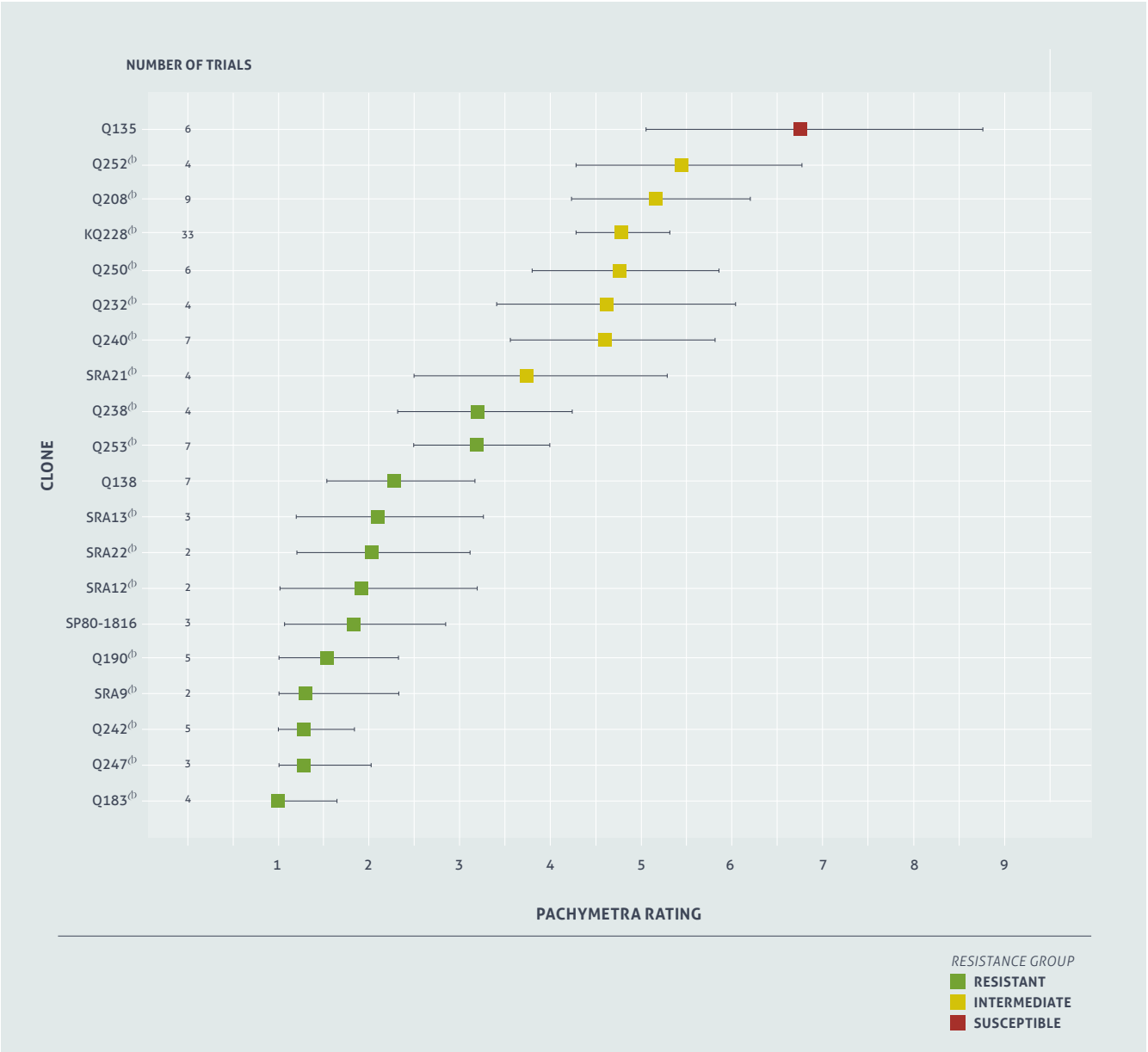
SMUT RATINGS

Smut resistance ratings are calculated from the incidence and severity of infection compared to standard varieties in inoculated field trials. The graphic includes the rating and the 95% confidence interval for each variety. The confidence interval is influenced by factors such as the number of trials and the uniformity of smut infection. For example the variety Q190(ф) has been tested in 25 trials and has a narrow confidence interval from 2.75 to 4.1 while the new variety SRA22(ф) has only been tested in five trials and ranges from 2.3 to 4.8 and new variety SRA21(ф) has only been tested in three trials and ranges from 2.3 to 5.7. Rating confidence will improve as more data is collected.



PACHYMETRA RATINGS

Pachymetra resistance ratings are calculated from the severity of infection in a test clone compared to standard varieties in inoculated bench trials. The graphic includes the rating and the 95% confidence interval for each variety. The confidence interval is influenced by factors such as the number of times a variety has been tested and variability of Pachymetra infection within each trial. For example the variety KQ228(ф) has been tested in 33 trials and has a narrow confidence interval from 4.25 to 5.3 while for the newer varieties, SRA21(ф) has only been tested in four trials and ranges from 2.5 to 5.3, and SRA22(ф) has only been in two trials and ranges from 1.2 to 3.2. Rating confidence will improve as more data are collected. The Pachymetra rating for Q253(ф) has been revised from Intermediate to Resistant using this new method of analysis, with its confidence interval ranging from 2.5 to 4.0 from seven trials. Similarly, the Pachymetra rating for Q250(ф) has been revised from Intermediate susceptible to Intermediate.



DISEASE RESISTANCE

Disease has the potential to lower the performance of varieties on your farm. This table will help you select varieties that will perform well given the diseases that may be present on your farm.

Central Disease Ratings										
VARIETY	SMUT	PACHYMETRA	LEAF SCALD	CHLOROTIC STREAK	ORANGE RUST	BROWN RUST	RED ROT	YELLOW SPOT	FIJI LEAF GALL	MOSAIC
SRA22Φ	R	R	I-R		R	R	I		R	R
SRA21Φ	I-R	I-R	R		R		I	R	R	I
SRA13Φ	I	R	R		R		I-R		R	R
SRA12Φ	I	R	R		R		I	I-R	I	I
SRA9Φ	I-S	R	R		R		I-R	I-R	I	R
Q253Φ	R	R	R		R	I-S	I	S	S	R
Q252Φ	I-R	I	R		R		R	I	I	R
Q250Φ	R	I	R		I		I	I-R	I-S	I-R
Q247Φ	I-R	R	R		R		R	S	R	R
Q242Φ	I-R	R	R	I	R		I-R	R	R	R
Q240Φ	R	I	R	I-R	R		R	I	I-S	R
Q238Φ	R	R	R	S	R	R	I-R	S	I-R	R
Q232Φ	I-R	I	R	R	R		I-R	R	I	R
KQ228Φ	I	I	R	S	R	R	R	I	I	R
Q208Φ	I-R	I	R	R	R	R	R	R	I-S	R
Q190Φ	R	R	R		R	I-R	R	I-S	R	R
Q183Φ	R	R	I	S	R	R	I	I-S	R	R
Q138	S	R	R	I-R	R	R	I-S	I	R	I-S
Q135	R	S	R	S	R	R	S	R	R	S
SP80-1816	I	R	R		R		R	I	R	R

Rotation of Varieties

Rotation of varieties for each crop cycle is important in the management of diseases. Arrange for your local productivity services officer to inspect your farm for disease. The *Diseases of Australian Sugarcane Field Guide* provides information on diseases including how to identify and manage them. The guide is available on the SRA website **sugarresearch.com.au.**

You will note that RSD resistance ratings are not included in this variety guide. Varietal resistance is not one of the three pillars of RSD disease management; growers should continue to ensure that disease-free seed cane is used to establish crops, that crops are planted into volunteer-free land and the equipment is decontaminated regularly.

No sugarcane varieties are resistant to RSD: they can all become infected, suffer yield losses, and further spread the disease.

Some varieties are more sensitive to RSD and carry significantly higher levels of the bacteria. In situations where RSD is a high risk and hygiene measures are not guaranteed, it may be appropriate to avoid varieties such as KQ228Φ, Q253Φ, SRA1Φ and SRA3Φ.

- Resistant **(R)**
- Resistant -Intermediate **(I-R)**
- Intermediate **(I)**
- Intermediate- Susceptible **(I-S)**
- Susceptible **(S)**
- Unknown

HARVEST MANAGEMENT

Select varieties for a harvest plan that can be followed to maintain maximum CCS throughout the year. The tables below indicate early, mid or late sugar varieties. The information presented in this table for the recently released varieties is based on very limited information and could be expected to differ in different circumstances and conditions. SRA will continue to monitor this information and update as more becomes available.

Central Harvest Management			
VARIETY	EARLY SUGAR	MID SUGAR	LATE SUGAR
SRA22Φ	Unknown	Unknown	Unknown
SRA21Φ	Good	Average	Average
SRA13Φ	Average	Average	Poor
SRA12Φ	Poor	Average	Average
SRA9Φ	Poor	Average	Good
Q253Φ	Good	Good	Average
Q252Φ	Average	Good	Good
Q250Φ	Good	Good	Average
Q247Φ	Average	Average	Average
Q242Φ	Average	Average	Average
Q240Φ	Good	Good	Good
SP80-1816	Poor	Good	Good

VARIETY	FAST AND RELIABLE GERMINATION	TRASH YIELD	TRASH	LODGING TOLERANCE
SRA22Φ	Good	Average	Free	
SRA21Φ	Reliable		Average	
SRA13Φ	Good	Average	Free-Average	Poor
SRA12Φ	Slow-Average	High	Average-Tight	Average-Good
SRA9Φ	Good-Reliable	Medium-High	Average-Tight	Average
Q253Φ	Very good	Good	Free-Average	Average
Q252Φ	Good	Average	Free	Average
Q250Φ	Good	High	Free-Average	Poor

Maximise your profit at harvest:
Selecting varieties for specific sugar maturity profiles, planting and harvesting them for optimal CCS maturity at time of harvest can make a significant difference in the profit your crop can make for you. Making harvest decisions based on in-field maturity maximises profit making decisions.

VARIETY BY HERBICIDE SCREENING TRIALS

Sugarcane varieties are known to have variable responses to herbicides with some being more impacted than others. As a result, data outlining susceptibility is critical to optimise productivity outcomes.

Since 2014, SRA has conducted trials following a two-step process to obtain reliable data for the susceptibility of varieties to herbicide. This process is:

- a fully randomised replicated pot trial in year one to shortlist the most susceptible combinations of varieties and herbicides
- a fully randomised replicated field trial in year two to confirm that the shortlisted combinations have an impact on yield.

In year three, the two-step process starts again, with new combinations of newly released varieties and herbicides.

In these trials, products are applied at their maximum label rate (and their minimum water label rate) when plant cane is at four- to six-leaf stage.

In the pot trials, weekly phytotoxicity ratings are conducted using the European Weed Research Council (EWRC) rating scale (table 1) and the aerial plant dry biomass is measured 10 weeks after spraying.

In the field trials, plant cane yield is measured at harvest using a weigh truck.

In all trials, KQ228$^{\phi}$ is assessed and used as a susceptible reference variety to compare to other tested varieties.

Table 2 describes the phytotoxicity symptoms obtained on KQ228$^{\phi}$ and their expected severity. All varieties present identical symptoms but their severity may vary between varieties.

Tables 3 and 4 summarise all phytotoxicity, biomass and yield results obtained in the pot and field trials from 2014 to 2020.

These tables are updated yearly to include newly tested combinations of varieties by herbicides.

TABLE 1 EWRC selectivity rating scale

SCORE	SELECTIVITY
1	No effect
2	Very slight effects. Some stunting and yellowing just visible
3	Slight effects. Stunting and yellowing obvious, effects reversible
4	Substantial chlorosis and or stunting, most effects probably reversible
5	Strong chlorosis/stunting, thinning of stand (50% loss)
6	Increasing severity of damage (70% loss)
7	Increasing severity of damage (85% loss)
8	Increasing severity of damage (90% loss) a few plants survive
9	Total loss of plants and yield

TABLE 2 Summary of phytotoxicity ratings and symptoms obtained on the reference susceptible variety KQ228$^{\phi}$

	2,4-D	2,4-D+ IOXYNIL	AMETRYN	AMETRYN+ TRIFLOXY SULFURON	AMICARBAZONE	ASULAM	DIURON	FLUMIOXAZIN	METOLACHLOR	METRIBUZIN	MSMA
DESCRIPTION OF SYMPTOMS	Small white spotty discolorations	Small yellow spotty discolorations	Yellowing of the whole plant	Slight yellow blotching	Small white spotty discolorations	Bright yellow blotching	Slight yellowing of the whole plant	Large necrotic lesions	Small necrotic lesions	Slight yellowing of the whole plant	Large necrotic lesions
PHOTOGRAPH OF SYMPTOMS		NA									
SYMPTOM SEVERITY ON KQ228$^{\phi}$	Mild	Mild	Medium to severe	Mild	Mild	Medium	Mild	Severe	Medium	Mild	Medium to severe
KQ228$^{\phi}$ PHYTO RATING RANGE											
	1.2 to 1.9	1.2	1.8 to 3.2	1.3	1.3 to 1.5	1.1 to 2.6	1.8	3.9 to 4.1	1.1 to 2.8	1.2 to 1.8	1.7 to 3.5

Table 3 - Herbicide symptoms severity on the cane foliage for all tested varieties. Average EWRC scores and associated colour code are presented for each tested combination of herbicides by variety. In each trial, KQ228$^{\phi}$ was used as our reference variety. Note that symptoms severity on KQ228$^{\phi}$ can vary between trials: weather conditions at application, and/or during the trial can alter cane growth and herbicide response. These EWRC scores are average scores for the 10-week assessment period, which means higher symptoms intensity and scores have been recorded during the assessment period.

Table 4 - Sugarcane dry biomass reduction in the pot trials measured 10 weeks after spraying and yield reduction in the field trial measured at harvest. The biomass reduction in the pot trials is represented in a green-to-red scale. The percentage value compared to the untreated is indicated in the table (a negative value indicates a biomass

For more information contact:
Emilie Fillols, Senior Researcher
T 07 4056 4510

TABLE 3 Phytotoxicity severity of symptoms (Legend: refer to table 1 on the left)

TRIAL ID	VARIETY	2,4-D	2,4-D+ IOXYONIL	AMETRYN	AMETRYN+ TRIFLOXY-SULFURON	AMI-CARBAZONE	ASULAM	DIURON	FLUMI-OXAZIN	METO-LACHLOR	METRIBUZIN	MSMA
#2014	Q208Φ	1.1	1.1		1.3		1.2			1.5	1.3	1.8
#2014	Q232Φ	1.2	1.2		1.2		1.2			1.5	1.2	1.8
#2014	Q238Φ	1.2	1.2		1.3		1.2			1.7	1.2	1.8
#2014	Q240Φ	1.2	1.2		1.3		1.2			1.5	1.2	1.8
#2014	Q242Φ	1.2	1.2		1.3		1.2			1.6	1.2	1.8
#2014	Q250Φ	1.2	1.2		1.3		1.2			1.6	1.2	1.8
#2014	Q252Φ	1.2	1.2		1.3		1.2			1.5	1.2	1.8
#2014	Q253Φ	1.3	1.2		1.3		1.2			1.6	1.2	1.8
#2014	SP801816	1.2	1.2		1.3		1.2			1.6	1.3	1.9
#2014	*Ref KQ228Φ*	*1.2*	*1.2*		*1.3*		*1.2*			*1.4*	*1.2*	*1.7*
#2017	SRA9Φ	1.7		1.6		1.1	2.3		3.3	2.0	1.2	3.0
#2017	SRA12Φ	1.6		1.8		1.4	2.6		4.1	2.4	1.4	3.3
#2017	*Ref KQ228Φ*	*1.6*		*2.4*		*1.5*	*1.8*		*3.7*	*2.1*	*1.6*	*3.2*
#2018	SRA13Φ	1.5		2.3		1.6	2.2		4.1	2.8	1.5	3.6
#2018	*Ref KQ228Φ*	*1.5*		*2.7*		*1.5*	*2.0*		*3.9*	*2.8*	*1.8*	*3.5*
#2019	SRA21Φ	2.2		2.6		1.1	1.2	1.6		1.2	1.5	3.3
#2019	*Ref KQ228Φ*	*1.9*		*3.2*		*1.3*	*1.1*	*1.8*		*1.1*	*1.6*	*3.1*

TABLE 4 Biomass reduction (pot trial)/yield reduction (field trial)

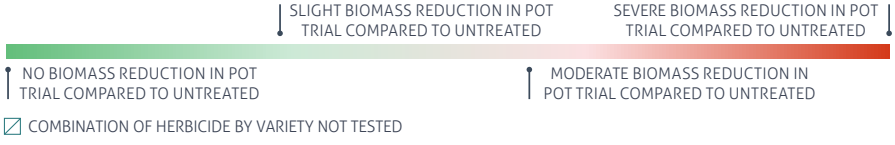
TRIAL ID	VARIETY	2,4-D	2,4-D+ IOXYONIL	AMETRYN	AMETRYN+ TRIFLOXY-SULFURON	AMI-CARBAZONE	ASULAM	DIURON	FLUMI-OXAZIN	METO-LACHLOR	METRIBUZIN	MSMA
#2014	Q208Φ	-1%	-11%		-28%		9%			-22%	-12%	-29%
#2014	Q232Φ	10%	17%		-35% (-9%)		0%			-9% (+4%)	-6% (-4%)	-17% (+1%)
#2014	Q238Φ	-10%	-1%		-33% (-19%)		-29%			-13% (-9%)	-22% (-14%)	-24% (-22%)
#2014	Q240Φ	-5%	-7%		-23%		-10%			8%	-11%	-19%
#2014	Q242Φ	9%	8%		-13% (+7%)		20%			13% (-3%)	-2% (-1%)	-2% (-17%)
#2014	Q250Φ	-12%	-11%		-35% (0%)		-23%			-21% (+8%)	-9% (+2%)	-31% (-7%)
#2014	Q252Φ	-7%	6%		-13%		22%			10% (+12%)	-12%	-13%
#2014	Q253Φ	-1%	-11%		-29%		-13%			1%	-24%	-23%
#2014	SP801816	1%	5%		-14%		13%			-13%	-23%	-21%
#2014	*Ref KQ228Φ*	*6%*	*-12%*		*-40%*		*7%*			*15%*	*-13%*	*-9%*
#2017	SRA 9Φ	-25%		**-60%**		-41%	**-56%** (-4%)		**-54%**	1%	-42%	**-55%**
#2017	SRA12Φ	-40% (-10%)		**-48%**		-23%	**-50%** (+4%)		**-64%**	-15%	-22%	**-50%**
#2017	*Ref KQ228Φ*	*-31% (+2%)*		***-80%***		*-36% (-10%)*	***-48%** (-9%)*		***-55%***	*-15%*	***-60%***	***-56%***
#2018	SRA13Φ	**-47%** (-7%)		-23%		8%	-18%		**-61%**	-13%	-2%	-39%
#2018	*Ref KQ228Φ*	*-49% (+2%)*		*-38% (-18%)*		*16%*	*-25% (-9%)*		*-37%*	*16%*	*-45%*	*-14%*
#2019	SRA21Φ	-3%		**-61%**		-20%	-11%	-43%		16%	-41%	-26%
#2019	*Ref KQ228Φ*	*-9%*		***-63%***		*-22%*	*0%*	*-44%*		*-2%*	*-35%*	*-36%*

Legend

% VALUE = BIOMASS REDUCTION (-%) OR GAIN (+%) IN THE POT TRIAL COMPARED TO THE UNTREATED

(% VALUE) = YIELD REDUCTION (-%) OR GAIN (+%) IN THE FIELD TRIAL COMPARED TO THE UNTREATED

(% VALUE) = YIELD REDUCTION (-10% OR MORE SEVERE) IN THE FIELD TRIAL COMPARED TO THE UNTREATED



reduction compared to the untreated, a value in bold indicates a significant biomass loss and, a positive value indicates a non-significant biomass gain compared to the untreated). Severe biomass reductions recorded 10 weeks after spraying are typical, as the plant metabolism has just been diverted into detoxifying the applied herbicide to the detriment of its growth. Usually yield loss by harvest time is less severe as the plant has had more time to recover from its growth delay. When available, yield reductions compared to the untreated from the field trials were also added in brackets. Red font indicates varieties whose yield was reduced by more than 10% compared to the untreated control (no yield loss was statistically significantly different to the untreated control at P 0.05). In each trial, KQ228Φ was used as our reference variety: note that the biomass reduction can vary between trials: weather conditions at application, and/or during the trial can alter cane growth and herbicide response.

VARIETY ADOPTION IN EACH MILL AREA

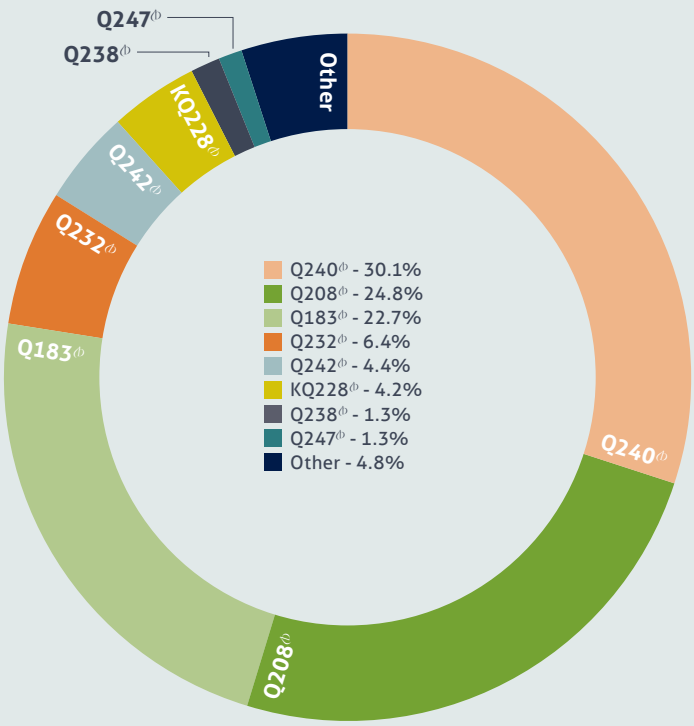
The following graphs are generated from mill statistics from the 2020 season. Use this information to assess yield performance of varieties over a number of years. Caution should be taken when comparing commercial performance of newer varieties (from plant and young ratoons) to older/established varieties (which include older ratoons).

Proserpine Mill (% TONNES 2020)

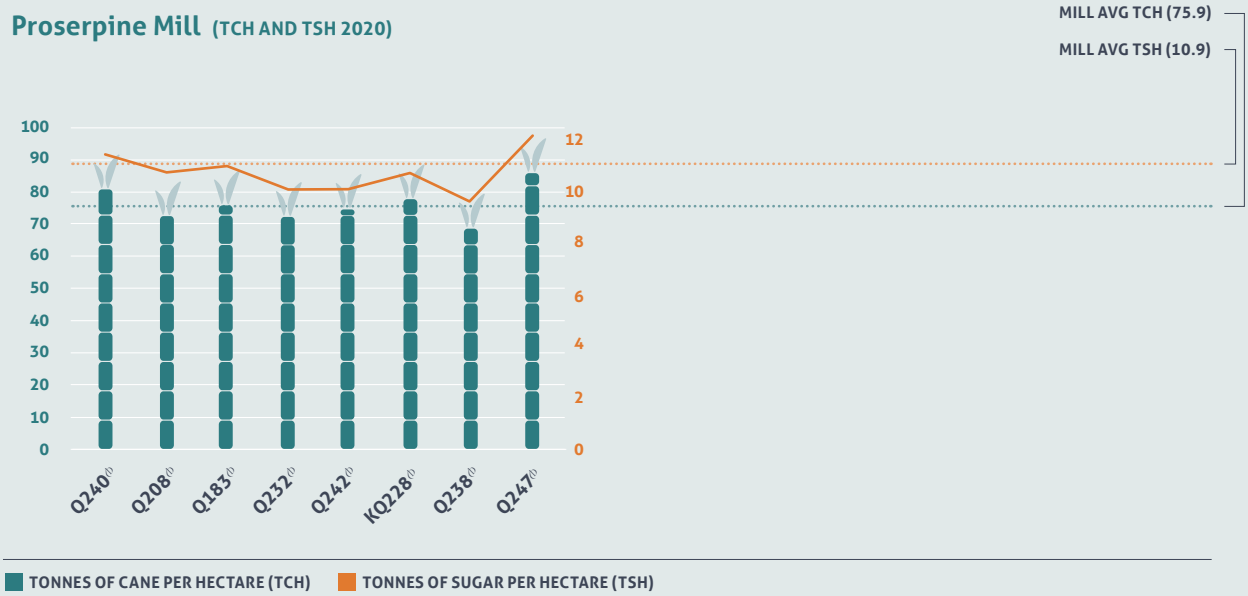
The Proserpine Mill area harvested 1,535,660 tonnes from 20,240 hectares in 2020 with an average of 76 TCH. The mill ave CCS increased to 14.36, up from 14.14 in 2019.

Q240Φ continued its dominance in Proserpine increasing from 23.8% in 2019 to 30.1% in 2020. Q208Φ remained in second place with 24.8% of total tonnage harvested in 2020, followed by Q183Φ with 22.7%. Together these three varieties make up 77.6% of the region.

Cane varieties above 1% of production that performed above mill average TSH were Q240Φ, Q247Φ and Q183Φ.



Proserpine Mill (TCH AND TSH 2020)

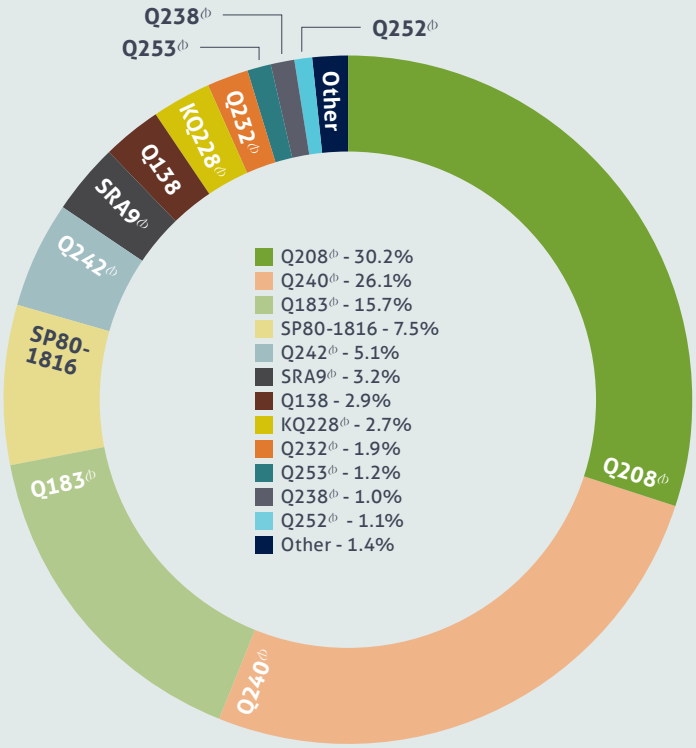


Mackay Sugar Mills (% TONNES 2020)

Mackay Sugar Mills reported 5,151,542 tonnes of cane harvested from 65,326 hectares in 2020. The mill average TCH increased to 79 and mill average CCS was steady at 14.12 compared to the 2019 crop.

Q208Φ again is the highest for the region at 30.2% of total production but is in line with the general downward trend for the whole of the central region. In 2012, Q208Φ was 50.1% of the Mackay production. Q240Φ is maintaining its steady increase in production with 26.1% in 2020, up from 25.5% in 2019. Q183Φ has remained steady at 15.7% in 2020, taking the top three varieties within the mill region to 72%.

Q208Φ, Q240Φ, SP80-1816, Q253Φ and SRA9Φ all produced higher tonnes sugar per hectare than the district average. Q253Φ and SRA9Φ may be influenced by the high proportion of plant cane to ratoon cane harvested. They are varieties to watch for into the future, along with SRA21Φ and SRA22Φ.



Mackay Sugar Mills (TCH AND TSH 2020)

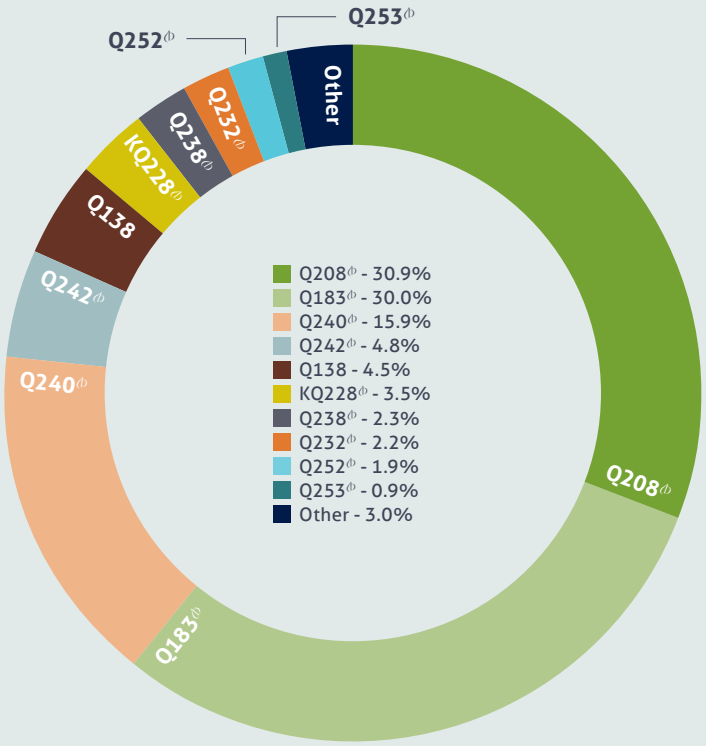
VARIETY ADOPTION IN EACH MILL AREA (CONT)

Plane Creek (% TONNES 2020)

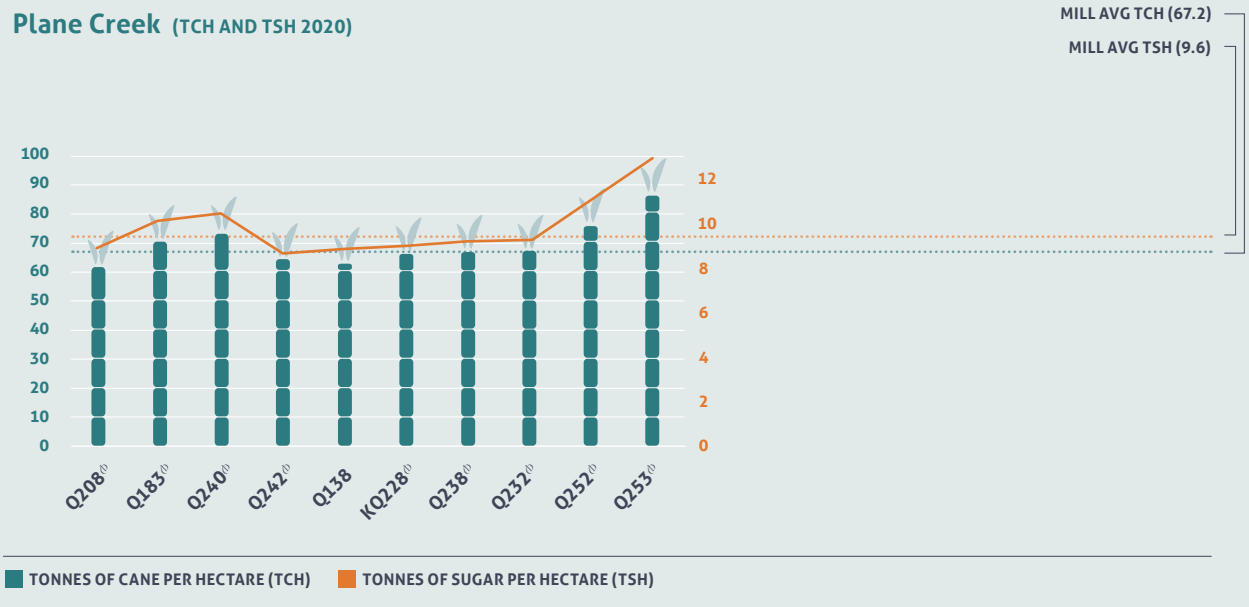
The Plane Creek region harvested 1,234,352 tonnes from 18,374 hectares in 2020, with a mill average of 67 TCH, and CCS of 14.25

Q208Ⓟ has declined over the last few years but in 2020 was still number one at 30.9% of total production down from a peak of 42.5% in 2012. Q183Ⓟ is competing with Q208Ⓟ for the top spot, increasing to 30%, up from 28.2% in 2019. Q240Ⓟ is steadily increasing with 15.9% of total production, an increase from 14.2% in 2019. The top performer with the highest TCH average of 76 T/Ha and highest TSH average of 11.1 was Q252Ⓟ, although this was produced from only 1.9% of the total production.

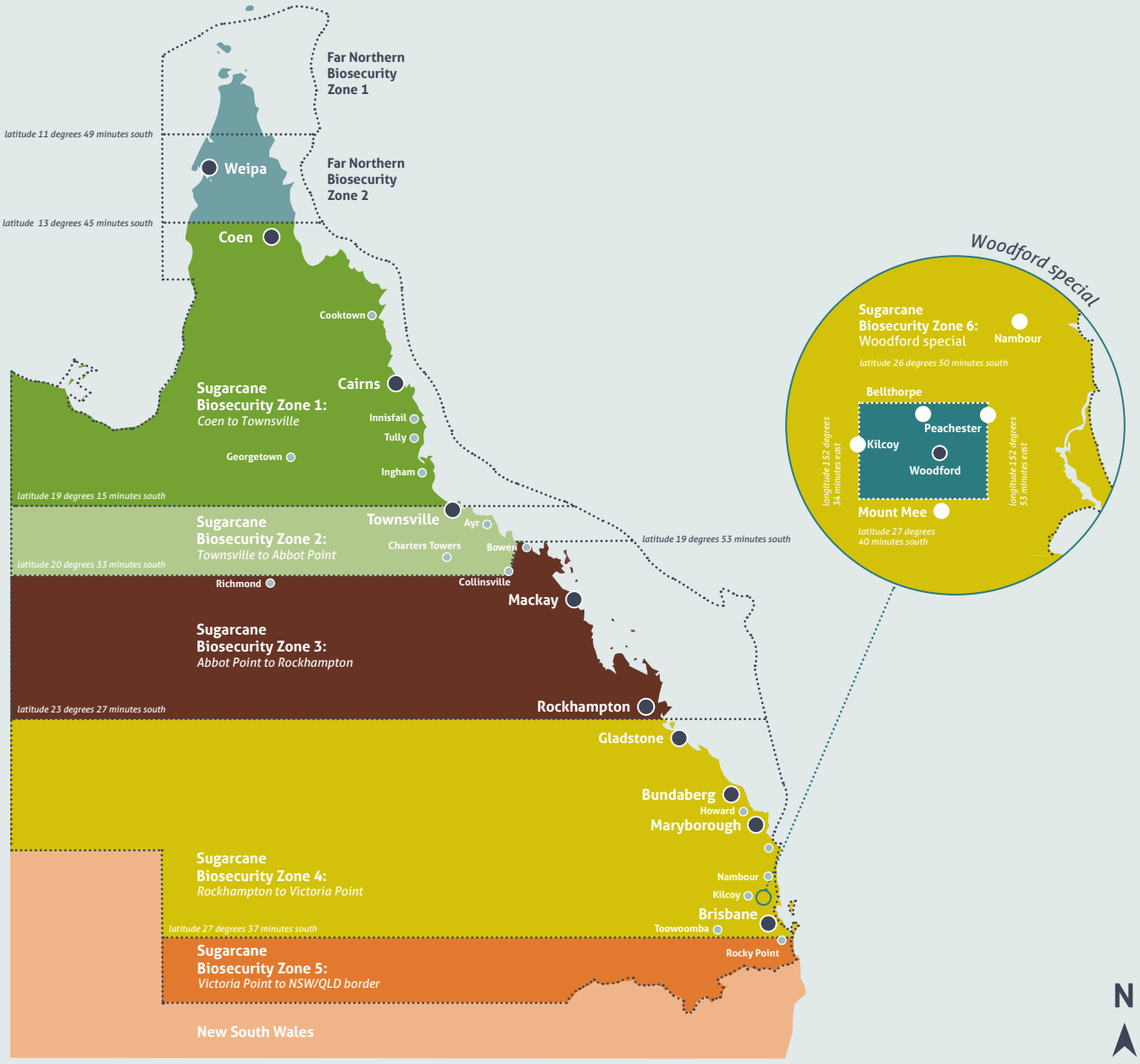
Q252Ⓟ, Q240Ⓟ, Q183Ⓟ, Q232Ⓟ and Q238Ⓟ make up the top 5 varieties in 2020 for TSH.



Plane Creek (TCH AND TSH 2020)



SUGARCANE BIOSECURITY ZONE MAP



- All appliances (harvesters and other sugarcane machinery) moving between sugarcane biosecurity zones must:
  - > be free of cane trash and soil
  - > be inspected by an authorised inspection person who will issue a Plant Health Assurance Certificate (PHAC)
  - > be accompanied during transportation by the PHAC.
- Machinery moving from NSW to Qld requires a Plant Health Certificate issued by NSW Department of Primary Industries.
- Machinery inspections can be arranged by contacting the local Productivity Service organisation.
- To move sugarcane plants (stalks, leaves, potted plants, etc) between biosecurity zones contact Biosecurity Queensland (13 25 23).

PROPAGATING NEW VARIETIES

Contact your local productivity services group for regional advice on varieties. They can supply clean planting material of recommended varieties and place orders for tissue culture plantlets.

Mackay Area Productivity Services (MAPS):
T 07 4963 6830

Plane Creek Productivity Services Ltd:
T 07 4956 1488

Sugar Services Proserpine Ltd:
T 07 4945 0513

Billet planting

PLANT MATERIAL FROM AN APPROVED-SEED SOURCE

Approved-seed provides cane growers with disease-free seed of varieties that are true-to-type. Disease-free seed (stalks, billets, setts or tissue culture plantlets used for planting) is a key control measure for systemic diseases of sugarcane, including chlorotic streak, Fiji leaf gall, leaf scald, mosaic, ratoon stunting disease (RSD) and smut. Provision of disease-free or approved-seed in each mill area in the Australian sugar industry is coordinated by SRA, in cooperation with the local productivity services group. SRA provides a disease-free supply of DNA fingerprinted new varieties. The local productivity services group multiplies the new varieties, maintaining the disease-free status and distributes the approved-seed to growers.

GROW SUGARCANE SPECIFICALLY FOR PLANTING MATERIAL

The block selected for growing plant material should be disease-free, weed-free and sugarcane volunteer-free. When selecting cane for planting material the cane should be less than one year old, erect and free from damage. Plan for two or more eyes per sett when harvesting for billets or stick planting. For non-irrigated regions plants should be well watered, have adequate nutrition immediately prior to harvest for billet planting. For irrigated regions you may need to reduce fertiliser rates, withhold irrigation or plant late in the season. The cane should also have originated from an approved seed plot and therefore be no more than three years away from long hot water treatment.

The best "whole farm" disease risk minimisation and productivity strategies can be achieved through consistent access to clean seed. It is highly recommended that cane considered for use as planting material be RSD tested well in advance of harvest so an informed choice can be made prior to planting.

SET UP THE HARVESTER FOR CUTTING HIGH QUALITY SOUND BILLETS

Rubber coating rollers and optimising the roller speeds to chopper speed will produce good quality billets with minimal split or crushed ends and damaged eyes. Reduce the speed of harvesting and maintain sharp basecutter and chopper blades for clean cutting. Disinfect the machinery used to cut and plant new varieties to limit the spread of disease and weeds.

Tissue culture

CALCULATE HOW MUCH TISSUE CULTURE TO ORDER

We've made it easier with our online tissue culture calculator. It demonstrates the speed at which large quantities of planting material can be produced from a set number of plantlets or for a set cost. Below is a look-up table including common results from the calculator (available at sugarresearch.com.au/calculator).

TRY TISSUE CULTURE AS AN APPROVED CLEAN SEED SOURCE

Tissue culture is an excellent source of clean seed for all varieties and can help reduce the spread of serious diseases such as RSD, smut and Fiji leaf gall. Tissue-cultured plantings are more uniform and produce more sticks than conventional plantings so larger quantities of planting material are achieved the following year. This means earlier commercial-scale production of more productive new varieties can be achieved when using tissue culture.

STAGE	ORDER DEADLINE FOR SPRING PLANTING	ORDER DEADLINE FOR AUTUMN PLANTING
Grower finalises order. Productivity services group places order with SRA.	15 November	1 July
Productivity services group receives established plantlets from nursery and distributes to growers.	Delivery on agreed date between grower, productivity services group and nursery. Available in August.	Delivery on agreed date between grower, productivity services group and nursery. Available in March.

ESTIMATED COST AND TIME TO SCALE UP NEW VARIETY PRODUCTION USING TISSUE CULTURE

Yr 1	No. plantlets ordered	100	250	500	1000
	Approximate cost	$150	$375	$750	$1500
	M row planted @ 0.8m	80	200	400	800
Yr 2	M row available for planting	2400	6000	12000	24000
	Ha avail for planting @ 1.8m	0.4	1.1	2.2	4.3

For more information on *varieties*, contact:
SRA Central Variety Officer **Chris Tom**
E ctom@sugarresearch.com.au T 0411 589 806

For more information on *tissue culture*, contact:
SRA Tissue Culture Manager **Clair Bolton**
E cbolton@sugarresearch.com.au T 07 3331 3374

PLANTING AND MANAGING TISSUE-CULTURED PLANTLETS IN THE FIELD

Planting

- Prepare soil to a fine tilth to ensure good soil/root contact.
- A seedling planter can be used if one is available, although hand planting small numbers is not a huge job. Plant them deep at the bottom of a drill to prevent stool tipping.
- Fill in after early growth.
- Plant the plantlets 500 mm to 1 m apart. A good distance is 800 mm, which will allow tillering to produce a high number of sticks.

Irrigating

- Provision of water is the most critical factor for the successful establishment of tissue culture plantlets.
- Irrigate plantlets immediately after planting and monitor them to ensure they don't dry out over the first three weeks to get the roots well established.
- If you do not have access to flood or sprinkler irrigation a simple irrigation system can be set up using cheap drip tape and an in-line filter hooked up to your garden tap or water tanker.

Insects

- If you expect problems with insects then an application of an insecticide drench (such as chlorpyrifos or imidacloprid) at planting will protect the young plantlets.
- In canegrub-prone areas use your standard grub control treatment.

Fertiliser

- Fertiliser requirements of the tissue cultured plantlets are the same as for billet plantings.
- If possible, plant with a planter mix to maintain good early growth, and side-dress later to avoid fertiliser burn.

Weeds

Weed control is important for good establishment and growth.

- Ideally pre-irrigate the soil to germinate weeds, then apply a knock-down herbicide or cultivate just prior to planting to reduce the weed pressure on young plantlets.
- Allow at least one week after planting before applying pre-emergent herbicides, longer if planted into cold, wet soils, as the root system needs time to establish:
  - > Atradex® at 2.5 kg/ha plus Dual Gold® at 1.5 L/ha has been successfully applied over the top, for grass and broadleaf weed control.
  - > Do not use diuron as young plantlets are sensitive to this product.
- Sempra® at 100 g/ha plus Activator at 200 mL/100 L for nutgrass. Both applications were sprayed over the top for nutgrass control.
- Do not use paraquat unless you have no other option and only on established plantings.

QCANESelect®

- Using sugarcane varieties that are best-suited to your farm may help maximise its productivity and profitability.
- QCANESelect® is an online tool that allows you to review, compare and select varieties for use on each block on your farm.
- To access QCANESelect® and the tissue culture calculator visit the SRA website **sugarresearch.com.au**
- The information in QCANESelect® is updated regularly based on our most recent trials and from observations and experiences of varieties that are growing in the field.
- Once you have identified the best varieties for planting on your farm, contact your local productivity services group to place orders for tissue-cultured plantlets.

Sugar Research Australia Limited
ABN 16 163 670 068

Brisbane Office 50 Meiers Road, Indooroopilly QLD 4068 Australia
Postal Address PO Box 86 Indooroopilly QLD 4068 Australia

T 07 3331 3333
E sra@sugarresearch.com.au
sugarresearch.com.au