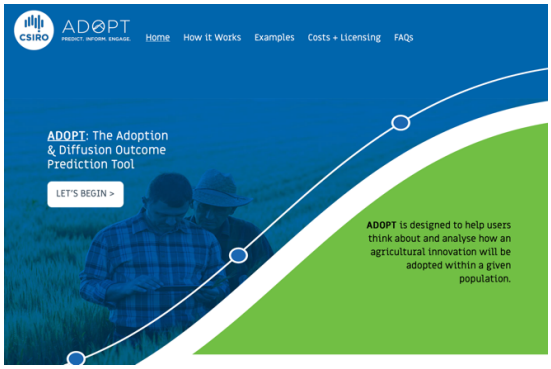
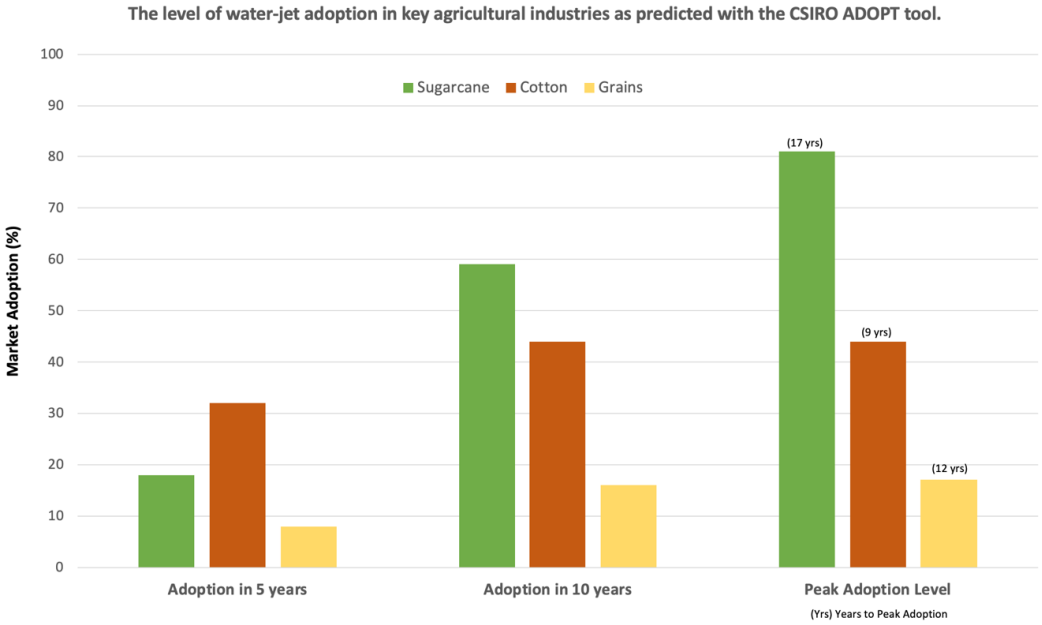
The future adoption of water-jet technology in sustainable farming systems.

G. Butler, SA NoTill Farmers Association

ADOPT is a tool developed by CSIRO that incorporates sets of factors that commonly influence the rate and peak level of adoption of agricultural innovation within a population.
https://adopt.csiro.au



In this project, the ADOPT tool was applied to ultra-high-pressure water-jet applications in sugarcane, cotton and grains.



Sugarcane, cotton and grains exhibited different adoption profiles that reflect the unique circumstances in each production system.

A summary of the adoption models and assumptions applied for sugarcane, cotton and grains are provided in the following pages.

Further Reading on ADOPT.
Kuehne G, Llewellyn R, Pannell D, Wilkinson R, Dolling P, Ouzman J, Ewing M,
Predicting farmer uptake of new agricultural practices: A tool for research, extension and policy.
Agricultural Systems, Volume 156, 2017, Pages 115-125, ISSN 0308-521X,
https://www.sciencedirect.com/science/article/pii/S0308521X16304541

SANTFA
SOUTH AUSTRALIAN NO-TILL FARMERS ASSOCIATION

Supporting early-stage adoption of ultra-high-pressure water-jet technology is a project delivered by the SA No-Till Farmers Association with funding support from the Australian Government's National Landcare Program.

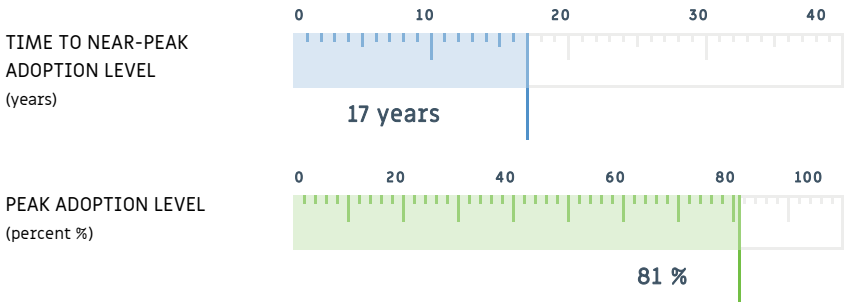
Australian Government
National Landcare Program

SUGARCANE

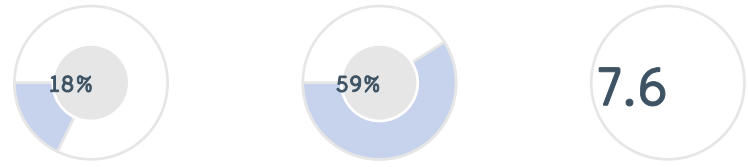
Sugarcane should expect to see moderate penetration (18%) in the next five years. In 10 years, the majority of the market (59%) may adopt water-jet technology. A peak adoption of 81% is forecast to happen in 17 years.

Environmental compliance factors, such as runoff into the reef, may be a strong influence on future adoption.

Adoption Level



Predicted adoption levels



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SUGARCANE

Changing the adoption levels

Many of the factors can be changed by activities such as extension. Based on the data entered, the ADOPT model suggests that changing the following factors would have the biggest effect on adoption.

Changing the peak adoption level

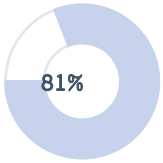
MOST SENSITIVE QUESTION

4 Enterprise scale

On what proportion of the target farms is there a major enterprise that could benefit from the innovation?

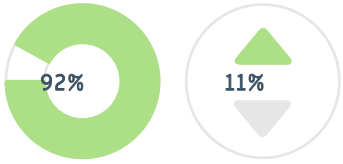
YOUR RESPONSE

About half of the target farms have a major enterprise that could benefit



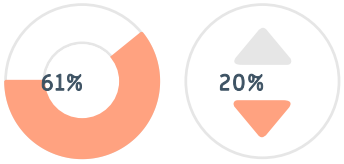
STEP UP RESPONSE

A majority of the target farms have a major enterprise that could benefit



STEP DOWN RESPONSE

A minority of the target farms have a major enterprise that could benefit



Changing the time to peak adoption level

MOST SENSITIVE QUESTION

7 Trialable

How easily can the innovation (or significant components of it) be trialled on a limited basis before a decision is made to adopt it on a larger scale?

YOUR RESPONSE

Difficult to trial

STEP UP RESPONSE

Moderately trialable

STEP DOWN RESPONSE

Not trialable at all

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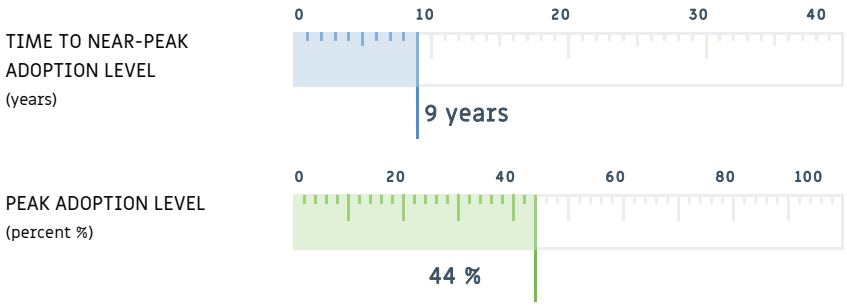
COTTON

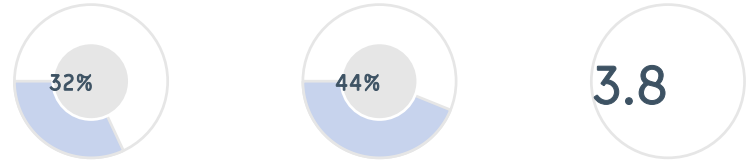
Initial adoption of water-jet technology in cotton production is likely to be higher than sugarcane, resulting in 32% adoption in 5 years. Peak adoption in cotton may occur in 9 years at 44% adoption.

The rationale for this adoption profile is largely driven by the lack of alternative solutions that cotton growers can use sustainably to terminate cotton ratoon.

Adoption Level



Predicted adoption levels



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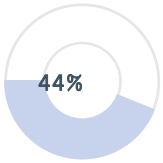
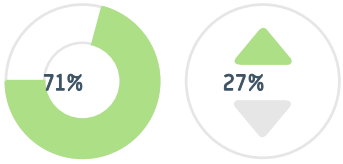
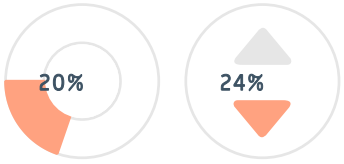
COTTON

Changing the adoption levels

Many of the factors can be changed by activities such as extension. Based on the data entered, the ADOPT model suggests that changing the following factors would have the biggest effect on adoption.

Changing the peak adoption level

MOST SENSITIVE QUESTION	YOUR RESPONSE
(16) Profit benefit in years that it is used To what extent is the use of the innovation likely to affect the profitability of the farm business in the years that it is used?	Small profit advantage in years that it is used 

STEP UP RESPONSE	STEP DOWN RESPONSE
Moderate profit advantage in years that it is used 	No profit advantage or disadvantage in years that it is used 

Changing the time to peak adoption level

MOST SENSITIVE QUESTION	YOUR RESPONSE
(7) Trialable How easily can the innovation (or significant components of it) be trialled on a limited basis before a decision is made to adopt it on a larger scale?	Easily trialable 

STEP UP RESPONSE	STEP DOWN RESPONSE
Very easily trialable 	Moderately trialable 

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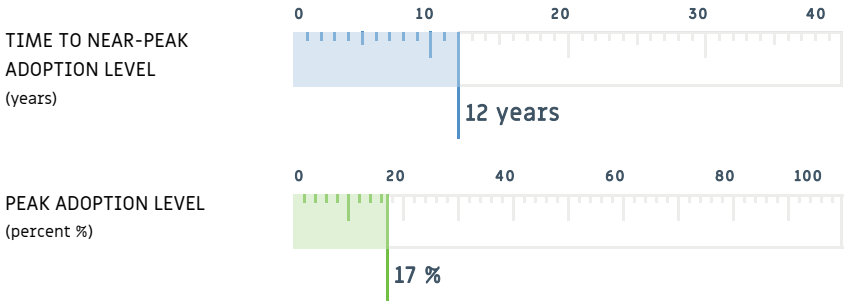
GRAINS

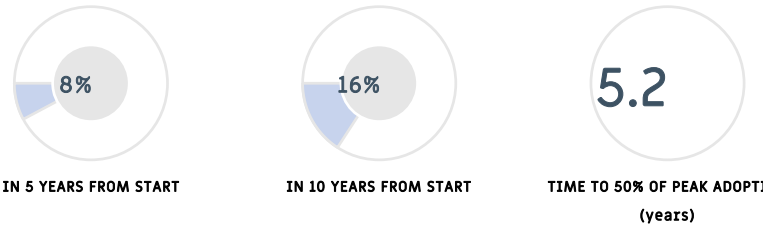
Grains has the lowest and slowest adoption response, reaching a peak adoption of only 17% in 12 years. Water-jet technology is best suited to northern Australian farming systems, including sugarcane, cotton and wide row grains.

This is largely due to the differences in grains production between northern and southern Australia. The water-jet system is lower cost to acquire and operate in the wide-row grain systems that prevail in northern Australia. Whereas, the narrow-row grain systems that prevail in southern Australia currently have technical and cost limitations that won't be overcome until the product is further refined in wide-row applications.

Adoption Level



Predicted adoption levels



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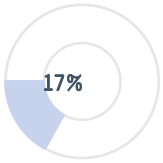
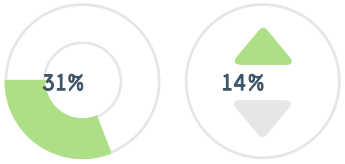
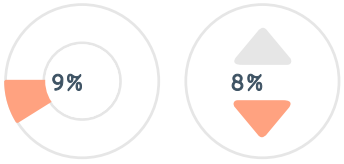
Changing the adoption levels

Many of the factors can be changed by activities such as extension. Based on the data entered, the ADOPT model suggests that changing the following factors would have the biggest effect on adoption.

Changing the peak adoption level

MOST SENSITIVE QUESTION	YOUR RESPONSE
(16) Profit benefit in years that it is used	Small profit advantage in years that it is used
To what extent is the use of the innovation likely to affect the profitability of the farm business in the years that it is used?	

STEP UP RESPONSE	STEP DOWN RESPONSE
Moderate profit advantage in years that it is used	No profit advantage or disadvantage in years that it is used
	

Changing the time to peak adoption level

MOST SENSITIVE QUESTION	YOUR RESPONSE
(7) Trialable	Easily trialable
How easily can the innovation (or significant components of it) be trialled on a limited basis before a decision is made to adopt it on a larger scale?	

STEP UP RESPONSE	STEP DOWN RESPONSE
Very easily trialable	Moderately trialable
	

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