



Sugar Research
Australia

SRA GUIDE TO MODERN HARVESTING

GATHERING SPIRALS, BASECUTTERS & FORWARD SPEED

Harvesting losses cannot be eliminated completely however, trials have shown that these can be reduced significantly if the harvester is set up and operated correctly. The harvesting operator has a crucial role in ensuring that the harvester is set up and operated in such a way that performance is optimised, cane quality is maximised and losses are minimised.

Even under optimum operating conditions, losses associated with the front end of the harvester can be significant and contribute to the overall harvesting losses the combined value of which can be equal to the cost of harvesting.

Finding the right balance between harvesting losses and the direct cost of harvesting makes everyone more money. Tools such as SCHLOT, shown to the right, (<http://calcs.schlot.com.au/>) allow all sectors to make an informed decision on finding the balance between loss and direct cost of harvesting.



SCHLOT HARVESTING TRIALS CALCULATORS SIGN IN

Simple Harvesting Calculator

Crop

Variety	Class	Row Spacing	Est Yield	Est CCS
Q208	Plant	1.8 / 1.83 Single	120	13

Conditions

Green/Burned	Field Conditions	Crop Presentation
Green	Heavy dew or recent rain	Erect

Machine

Gathering spirals

The gathering spirals on the harvester do cause losses and damage which increase with a gain in forward speed in any given crop and especially in lodged crops.

Crop presentation (erect vs lodged, row profile, row width) is the main factor determining the level of pick-up loss. When harvesting sprawled cane or heavily lodged crops the gathering spirals struggle to pick-up and guide cane stalks into the throat of the machine. Side knives/saws in tangled crops reduce stools being torn out but increase pick-up losses. Minimising pick up losses depends on matching ground speed to field conditions.

Basecutters

Basecutters contribute to cane losses, increase dirt levels and can damage the stool, which impacts crop ratoonability.

Losses associated with basecutters are due to:

- Basecutter height
- Blade configuration and condition
- Forward speed

Basecutter blade tips should ideally be skimming the surface. Modern machines face a compromise between good cane pick-up and dirt intake. If basecutters are set above ground level, pick-up losses increase and stalk shattering and feeding problems may occur. If they are set too deep, excess soil is fed into the machine.

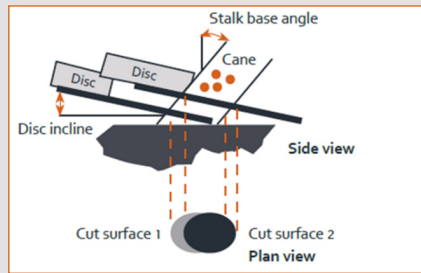
Basecutters (Continued)

As a blade wears, it not only loses length but also becomes rounded and therefore loses much of its cutting capability. At some point along the curve of the blade, the cane prefers to slide along the edge and tear, rather than be cut.

To minimise stool and stalk damage keep basecutter blades as long and square as practically possible.

The main causes of stool damage are:

- Blade smashing rather than cutting
 - Angle of leading edge of blade
 - Sharpness of cutting edge
 - Relative contact speed
- Basecutter disc contact causing splitting of stalk into stool
 - Blade length, sharpness, number of blades, rpm etc.



(Image above) Disc contact which causes stool fracture and stalk splitting down into the stool. The parameters are due to: Speed, blade length, number of blades, rpm etc.

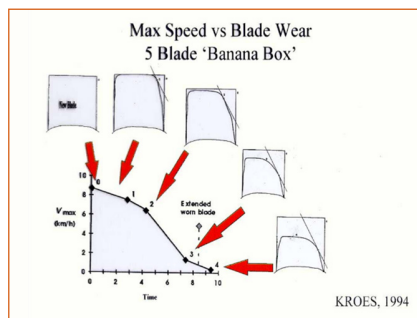
(Images right) A poor basecutter job associated with blunt blades and/ or high forward speed. This causes the stalk to be torn not cut, dramatically increases stool damage and can increase soil in cane supply.



Forward speed

Many factors impact forward speed including wet conditions, crop size and condition, stool tipping and insect damage.

At higher forward speeds, higher yielding and heavily lodged crops suffer greater damage and higher cane loss (over loading cleaning chamber).



Modelling shows that in good conditions—for example erect crop single row and dry soil—forward speeds of up to 8 km/h will cause minimal stool damage provided that the basecutter blades are new (see figure above).

To maintain negligible stool damage, harvester forward speed should reduce to 6 km/h when 25 mm of blade has been lost from its corner.

Summary

- Crop presentation (erect vs lodged, row profile, row width) is the main factor determining the level of pick-up loss.
- Keep basecutter blades as long and square as practically possible
- Aim to skim the surface
- As basecutter blade wear increases forward speed should reduce.

For more information contact:

Phil Patane

E: ppatane@sugarresearch.com.au
T: (07) 4776 8202

Carol Norris

E: cnorris@sugarresearch.com.au
T: (07) 4963 6824

Garry Landers:

E: glanders@sugarresearch.com.au
T: (07) 3331 3332

Copyright © 2018 • All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior permission of SRA. **Disclaimer** In this disclaimer a reference to 'we', 'us' or 'our' means SRA and our directors, officers, agents and employees. Although we do our best to present information that is correct and accurate, we make no warranties, guarantees or representations about the suitability, reliability, currency or accuracy of the information we present in this Information Sheet, for any purposes. Subject to any terms implied by law and which cannot be excluded, we accept no responsibility for any loss, damage, cost or expense incurred by you as a result of the use of, or reliance on, any materials and information appearing in this Information Sheet. You, the user, accept sole responsibility and risk associated with the use and results of the information appearing in this Information Sheet, and you agree that we will not be liable for any loss or damage whatsoever (including through negligence) arising out of, or in connection with the use of this Information Sheet. We recommend that you contact our staff before acting on any information provided in this Information Sheet.

Warning Our tests, inspections and recommendations should not be relied on without further, independent inquiries. They may not be accurate, complete or applicable for your particular needs for many reasons, including (for example) SRA being unaware of other matters relevant to individual crops, the analysis of unrepresentative samples or the influence of environmental, managerial or other factors on production.