Growing maize for silage

Introduction
The HSR brand has been well respected from its initial Snowy River days for the high quality maize varieties available to dairy producers in Australia. Dent types are well known around the world for their higher protein and starch levels compared to flint types. And the existing HSR dent types have combined high yields, high ME and low NDF – the three main factors driving profitability of growing and feeding maize to dairy cows.

Cob is king
HSR think about maize and maize silage a little differently than most. We all know that farmers grow maize for starch and we know that starch = energy.
Total MJ ME per hectare is the important bottom line for cow condition, milk production and profit per hectare.
We also know that the greatest proportion of a maize crop’s energy comes from the cob.
The higher the cob to stover ratio is, the higher the energy per hectare.
The size of your cob really does matter, when you compare the energy of a cob at around 13.5 ME/kg DM to the stover at only around 6.5 ME/kg DM.
HSR maize is bred to deliver highest ME/ha.
Because HSR maize is selected for:
• Higher cob to stover ratio, and
• Higher kernel to pith ratio

Selection
HSR brand maize is particularly well suited for high quality silage production for dairy producers from central Queensland to southern Tasmania.
The key to selection of the best variety will be based around the highest yielding highest quality option for the growing season.
Producers should use the longest growing season option possible for their region, selecting varieties with the best quality parameters for silage. Picking the correct maturity is critical to getting the best result in any particular region and season. Crop agronomy then becomes the important issue to achieve the potential offered by the correct variety and growing conditions.

Very short growing season – less than 100 days
• MFY 136 – 82CRM
• Flint type for the shortest growing season rotation

Short growing season – around 100CRM
• Maximus – 102CRM
• Dent type for high starch
• High cob to stover ratio for increased digestibility and ME

Medium growing season – around 110CRM
• Olympiad – 112CRM
• Dent type for high starch
• High cob to stover ratio for increased digestibility and ME

Full growing season – around 120CRM
• Amadeus – 118CRM
• High quality flint type suitable for gritting, grain and silage
• Good disease resistance for wide geographic suitability
Maximus maize continues to be a favourite for dairy producers in the southern dairy regions of south west WA, south east SA, southern Victoria and Tasmania.

It is recognised as the cold start specialist, making it suitable for planting in these areas where the soil temperature is slow to increase coming into spring. It can be planted earlier than most other varieties, requiring soil temperatures of 10°C and rising.

In a block trial comparison Tim Perrett compared Maximus, Pioneer 9400 and MFY 139.

At harvest the maize had similar yields but the Maximus was clearly taller and leafier and had a higher dry matter percentage. But it was the quality characteristics of the Maximus that stood out above the other two options.

Maximus being a dent type had higher digestibility and metabolisable energy, higher crude protein, starch and fat concentrations. This enabled a feed conversion ratio of 0.7kg maize per litre of milk, significantly better than the other two options.

Inputting this data into Seed Force’s Animal Performance Calculator, Maximus would have produced an extra 2,900 litres of milk per hectare over the Pioneer 9400 and almost 6,500 litres of milk per hectare over the very short season variety.

This result highlights the importance of selection of the most suitable maturity for the location and growing window, with the 102CRM being more suitable than the 94 and 88CRM varieties respectively in this case.

### Table: Comparisons

<table>
<thead>
<tr>
<th>Unit</th>
<th>Maximus</th>
<th>P9400</th>
<th>MFY139</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield kg DM/ha</td>
<td>13,150</td>
<td>12,400</td>
<td>12,400</td>
</tr>
<tr>
<td>DM %</td>
<td>43.5</td>
<td>41.0</td>
<td>41.0</td>
</tr>
<tr>
<td>Utilisation rate %</td>
<td>0.95</td>
<td>0.95</td>
<td>0.95</td>
</tr>
<tr>
<td>Utilised feed kg DM/ha</td>
<td>12,493</td>
<td>11,780</td>
<td>11,780</td>
</tr>
<tr>
<td>NDF% %</td>
<td>33.7</td>
<td>38.3</td>
<td>43.8</td>
</tr>
<tr>
<td>ME MJ per kg DM</td>
<td>12.3</td>
<td>12.0</td>
<td>11.0</td>
</tr>
<tr>
<td>Protein</td>
<td>11.1</td>
<td>11.2</td>
<td>11.9</td>
</tr>
<tr>
<td>Starch</td>
<td>50.7</td>
<td>42.5</td>
<td>36.4</td>
</tr>
<tr>
<td>Fat</td>
<td>4.1</td>
<td>3.9</td>
<td>3.9</td>
</tr>
<tr>
<td>Total milk litres / ha</td>
<td>18,370</td>
<td>15,448</td>
<td>11,834</td>
</tr>
<tr>
<td>Price 0.45c / litre</td>
<td>0.45</td>
<td>0.45</td>
<td>0.45</td>
</tr>
<tr>
<td>Gross income $</td>
<td>8,266</td>
<td>6,952</td>
<td>5,325</td>
</tr>
<tr>
<td>FCE Utilised</td>
<td>0.7</td>
<td>0.8</td>
<td>1.0</td>
</tr>
<tr>
<td>kgs DM / litre milk Grown</td>
<td>0.7</td>
<td>0.8</td>
<td>1.0</td>
</tr>
<tr>
<td>Costs $</td>
<td>315</td>
<td>297</td>
<td>298</td>
</tr>
<tr>
<td>Seed $/ha</td>
<td>378</td>
<td>356</td>
<td>358</td>
</tr>
<tr>
<td>Fertiliser $/ha</td>
<td>600</td>
<td>600</td>
<td>600</td>
</tr>
<tr>
<td>Irrigation $/ha</td>
<td>400</td>
<td>400</td>
<td>400</td>
</tr>
<tr>
<td>Harvest &amp; stack $/ha</td>
<td>395</td>
<td>372</td>
<td>372</td>
</tr>
<tr>
<td>Inoculation $/ha</td>
<td>66</td>
<td>62</td>
<td>62</td>
</tr>
<tr>
<td>Covering $/ha</td>
<td>39</td>
<td>37</td>
<td>37</td>
</tr>
<tr>
<td>Total costs $/ha</td>
<td>1,838</td>
<td>1,790</td>
<td>1,792</td>
</tr>
<tr>
<td>Gross margins $/ha</td>
<td>6,428</td>
<td>5,161</td>
<td>3,533</td>
</tr>
<tr>
<td>Extra profit $/ha</td>
<td>+1,267</td>
<td>0</td>
<td>-1,628</td>
</tr>
</tbody>
</table>

Comparisons made based on yield and quality data provided and estimated growing costs from the APC model.
With a very short growing season only available for his program, Ross Woodhouse opted to try a 40ha pivot of the new 82CRM maize HSR MFY 136. With a few changes in planning before sowing on a lease block that had little time for preparation, light soils and low P and K levels, the new crop yielded an average 14.5tDM/ha. Due to the varying soil nutrition, the crop yield was also highly variable with poor areas at 9t DM/ha and the best at 18.45tDM/ha, which shows the potential for the variety.

Due to the change in site the crop was planted late in mid-December and was in ground for 118 days, harvest was at 40% DM so was about 6 days past ideal, however ensiled well with good quality silage as a result.

Interestingly, the variety was selected because of the short window available however still took about 112 days to reach ideal maturity for harvest. This is because the location experiences cooler average daytime temps and much cooler nights than the Busselton crop which was only 70 km north.

This highlights the importance of doing the homework on heat unit accumulation for the crop site to make sure varietal selection fits the growing window available, particularly when an autumn pasture is planned following harvest of the summer crop.

Whilst it may have been an expensive crop due to high diesel irrigation costs, at $240/t inclusive of all costs, it was still cheaper than similar quality supplementary feed landed at $350/t. The crop has given him encouragement to grow a similar area in 2014 and possibly another 40ha at his Scott River property.
New maize variety Amadeus produces big result for mid north coast dairy farmer

All maize silage crops are an important part of supplementary feeding during winter or shortfalls in seasonal pasture growth. Quality is highly regarded as the most important aspect, along with yield when growing maize for silage.

With a range of top quality maize hybrids from HSR and Seed Force available to suit growing conditions from central Queensland to southern Tasmania, dairy producers can now choose a high performance hybrid that best fits with their growing season.

Dairy producers Graham and Kathy Forbes of “Heatherdale” in Gloucester on the mid north coast of New South Wales chose to grow HSR Amadeus from Seed Force during 2013/14 summer season after some interim feed test data and yields from a grower trial -the previous year proved to be very positive.

In those 2012/13 trials HSR Amadeus tested well with ME over 11%, NDF's as low as 34%, starch levels at 37% and yields over 60 wet tonnes/ha in a moderate year.

Graham chose to grow 18ha of HSR Amadeus for pit silage as he saw it as a great option for high quality and high yielding maize, given its 118CRM would suit his mid north coastal climate.

“The Amadeus this season proved to be very resilient in the dry summer we had on the coast with strong stay green crop with big grain and a very sweet kernel. The crop just held in there, even when we saw other varieties in our block trials stressing badly due to the lack of moisture. The Amadeus had good stay green trait and kept growing large cobs with very big kernels,” Graham said.

“We will be growing Amadeus this season and would recommend it as the new high quality high yielding variety for the mid north Coast,” Graham added.

As well as HSR Amadeus for a full growing season (118CRM), dairy producers can also choose HSR Olympiad for a medium growing season (112CRM), HSR Maximus for a short growing season (102CRM), and HSR MFY139 (88CRM) and HSR MFY 136 (82CRM) for a very short season.

“The Amadeus this season proved to be very resilient in the dry summer we had on the coast with strong stay green crop with big grain and a very sweet kernel”. 
Cob is king for silage nutrition.

The bigger the cob, the higher the energy per hectare.

Size does count when you want to make the most of your silage. Grow HSR maize bred to deliver the highest ME/ha. With a higher cob to stover ratio and a higher kernel to pith ratio, HSR maize gives you more energy per hectare because cobs are bigger. So improve cow condition, milk production and profit per hectare with high ME HSR maize from Seed Force.

Choose the HSR variety to best suit your growing season:

- **MFY 139**: CRM 88
- **Maximus**: CRM 102
- **Olympiad**: CRM 112
- **Amadeus**: CRM 118

104 - 106 Drummond Rd Shepparton VIC 3630
T: 03 5832 3800 F: 03 5821 8999 www.seedforce.com
Tips for getting the best from your crop

Sowing the crop

Being a large seed, maize can be planted deeper than most other plant species to be sown where moisture is within the soil profile – ideally 2–4cm depth.

- Wait until soil temperatures reach 12°C and above at the planting depth for a more uniform germination.
- Sow using a precision planter with starter fertilizer being added 5–7cm away and 2–4cm below the seed.

Irrigation

Maize has a high requirement for water and ideally should have 4–7mL for production, with the capacity to provide about 25mm water per week. This needs to be balanced with rainfall during the growing period with soil maintained at or near field capacity.

- Maize uses the majority (70%) of its water requirement three weeks either side of tasselling.
- Therefore if irrigation is limited, it is important to irrigate during the critical period from 2–3 weeks before tasselling until 2–4 weeks after tasselling.

Making silage

- Maize is ideal for direct harvesting and storage as silage.
- Correct harvest timing can be determined by observing the developing grain milk line within the grain kernel.
- Aim for 35–38% plant dry matter with dent x dent hybrids.
- At this stage yield, feed quality and dry matter content will be optimised.

Nutrition

- Maize silage has the potential to achieve yields in excess of 30tDM/ha and will need adequate nutrition to achieve this.
- It is recommended that all the Potassium requirement and 80% of Nitrogen is applied prior to planting.
- This includes the DAP at planting with the planter and the other Nitrogen deep preferably banded, or broadcast and worked in with the Potassium.
- Side dressing of the other 20% of Nitrogen can occur all the way to tasselling, preferably through the irrigation water.
- Maize nutrition requires a focus on the major nutrients N, P and K, plus the minor nutrients S, Ca and Mg.
- Certain soil types may also have a requirement for the micro-nutrients Zn, B, Cu and Fe. Take a soil test to determine the best fertiliser regime to achieve your target yield.

<table>
<thead>
<tr>
<th>Silage yield tDM/ha</th>
<th>N kg/ha</th>
<th>P kg/ha</th>
<th>K kg/ha</th>
<th>S kg/ha</th>
<th>Ca kg/ha</th>
<th>Mg kg/ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>14</td>
<td>1.8</td>
<td>10</td>
<td>1</td>
<td>1.6</td>
<td>1.7</td>
</tr>
<tr>
<td>12</td>
<td>192</td>
<td>36</td>
<td>48</td>
<td>9.6</td>
<td>3.6</td>
<td>24</td>
</tr>
<tr>
<td>18</td>
<td>288</td>
<td>54</td>
<td>72</td>
<td>14.4</td>
<td>5.4</td>
<td>36</td>
</tr>
<tr>
<td>24</td>
<td>384</td>
<td>72</td>
<td>96</td>
<td>19.2</td>
<td>7.2</td>
<td>48</td>
</tr>
</tbody>
</table>

Source: Top fodder successful silage

www.seedforce.com
104-106 Drummond Rd, Shepparton VIC 3630
Phone 03 5832 3800 Fax 03 5821 8999

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