Sixty sugarcane growers trialling enhanced efficiency fertilisers (EEFs) have helped reveal new opportunities for nutrient management. The EEF60 project is a collaborative partnership between sugarcane growers, CANEGROWERS, Sugar Research Australia (SRA), regional productivity services and agricultural economists from the Department of Agriculture and Fisheries (DAF).

CANEGROWERS manager Burn Ashburner said that collaboration between researchers and growers is vital to identify practical on-farm management options that maintain industry profitability, which has been a key focus of the EEF60 project.

Growers in the project were given a choice of EEFs to trial, alongside three other set fertiliser treatments. Many growers decided to test either urea with nitrification inhibitors or controlled release fertiliser (CRF) blends. A few growers decided to test liquid fertilisers. The project will have one more harvest (2020), but preliminary results reveal that the grower chosen EEFs have performed as well as urea at the SIX EASY STEPS recommended N rate.

The project was designed to test what, where and when EEFs can optimise performance on sugarcane farms located between Mossman and Childers. Key indicators used to measure performance include cane yield, CCS, sugar yield and profitability.

EEFs were tested at N rates below SIX EASY STEPS due to having higher costs than urea (per tonne) and their ability to better match crop N uptake over the growing season (see Table). Applying the grower-chosen EEFs (mostly urea with nitrification inhibitor, or 80% urea and 20% controlled release fertiliser blends) at N rates 20% below SIX EASY STEPS had similar costs to urea applied at SIX EASY STEPS.

**Table: List of fertiliser treatments trialled at most farms**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>PRODUCT</th>
<th>N RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment 1</td>
<td>Urea</td>
<td>SIX EASY STEPS</td>
</tr>
<tr>
<td>Treatment 2</td>
<td>Urea</td>
<td>20% below SIX EASY STEPS</td>
</tr>
<tr>
<td>Treatment 3</td>
<td>EEF – 2/3 CRF*, 1/3 NI**</td>
<td>20% below SIX EASY STEPS</td>
</tr>
<tr>
<td>Treatment 4</td>
<td>EEF – grower chosen</td>
<td>20% below SIX EASY STEPS</td>
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</tbody>
</table>

*controlled release fertiliser (CRF)  
**nitrification inhibitor (NI)
Preliminary results indicate that compared to the urea at SIX EASY STEPS treatment (treatment 1):

- The grower chosen EEFs (treatment 4) obtained similar yields and profitability in the Wet Tropics and Burdekin trials;
- The grower chosen EEFs (treatment 4) obtained slightly lower yields in the Central region trials (-2.2 tonnes of cane/ha TCH) but profitability remained similar;
- Urea applied at the lower N rate (treatment 2) obtained slightly lower yield (-1.7 to -2.9 TCH) in the Wet Tropics and Burdekin, however, had marginally higher CCS (+0.1 unit) in the Burdekin;
- The 2/3 CRF and 1/3 NI EEFs (treatment 3) generally obtained similar yields (though slightly lower in Central region by -1.3 TCH) but profitability was generally lower due to higher product costs.

SRA Researcher Julian Connellan said more comprehensive data analysis will be undertaken following the third harvest this year.

Results from the data analysis will provide guidance around what types of EEF perform better (nitrification inhibitors versus blends of urea and controlled release fertiliser), where do they perform better (e.g. sandy soils versus clay or loam, or particular climates/regions), and when do they work best (e.g. applied late versus early in the season).

"The results should help identify in what situations growers have the option of applying EEFs profitably," said DAF economics manager Mark Poggio.

The EEF60 project is a partnership between 60 sugarcane growers, CANEGROWERS who manage the project, SRA who conduct the trials, regional productivity services including BPS, HCPSL, MAPS and Innisfail CANEGROWERS who provide on-ground trial support and extension, and agricultural economists from the Queensland Government Department of Agriculture and Fisheries who evaluate the profitability of the different fertilisers. Essential support is also provided by the many harvesting operations and mill personnel involved. The project is funded by the Australian and Queensland governments.