The process for estimating the amount of nitrogen contributed from a legume crop comes from the work of the Sugar Yield Decline Joint Venture.

**STEP 1. CALCULATE WET BIOMASS (T/HA).**
- Cut all plants at ground level within several 1m lengths of row (plots) from representative sections of the legume crop.
- Immediately weigh (kg) each plot as it is cut.
- Average the weights of all plots that were cut.
- Divide average plot weight (kg) by row spacing (m) to determine kg wet biomass per m² (kg/m²).
- Multiply kg/m² by 10 to determine tonnes wet biomass per hectare (t/ha).

**STEP 2. CALCULATE DRY BIOMASS (T/HA).**
- Dry plant samples (or a representative sub-sample) in an oven at 70°C.
- It may take several days to reach a constant dry weight.
- Determine percentage dry matter (%):
  \[ \text{Dry matter (\%)} = \frac{(\text{Dry weight} + \text{Fresh weight})}{\text{Fresh weight}} \times 100 \]
- If this is not an option, research has shown that the dry biomass per hectare is approximately 25% of wet biomass per hectare.
STEP 3. MEASURE NITROGEN CONCENTRATION.

- The dried samples can then be sent to a laboratory to have nitrogen concentration analysed, which will be expressed as a percentage of dry weight.
- If this is not an option, table 1 below has some approximate nitrogen concentrations.

Table 1.

<table>
<thead>
<tr>
<th>General Crop N Concentration (%)</th>
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<tbody>
<tr>
<td>Soybean</td>
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<tr>
<td>Cowpea</td>
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<tr>
<td>Lab-lab</td>
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<tr>
<td>Peanut</td>
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</tbody>
</table>

Source: Sugarcane Yield Decline Joint Venture

Step 4. calculate nitrogen content of above ground biomass.

- Dry biomass (t/ha) x nitrogen concentration (%) = t N/ha
- t N/ha x 1000 = kg N/ha

STEP 5. CALCULATE NITROGEN CONTENT OF TOTAL CROP.

- The nitrogen content of the roots is approximately 30% of that of the above ground biomass.
- Nitrogen content of above ground biomass + Nitrogen content of crop roots

'Step 6. calculate nitrogen content of crop if harvested for grain.

Total crop N content (kg N/ha) x 0.33

EXAMPLE:

Soybean fallow crop.

STEP 1. Three 1m x 1.83m (row spacing) plots were cut from the legume crop

These plots weighed 2.4 kg, 2.6 kg and 2.8 kg

The average weight of the plots was (2.4 + 2.6 + 2.8) ÷ 3 = 2.6 kg/plot

2.6 kg/plot + 1.83m = 1.42 kg/m2

1.42 kg/m2 x 10 = 14.2 t/ha of wet biomass

STEP 2. Dry matter = 25%

14.2 t/ha x 0.25 (25% dry matter) = 3.55 t/ha of dry biomass

STEP 3. N concentration = 3.5%

STEP 4. 3.55 t/ha of dry biomass x 0.035 (3.5% N) = 0.1243 t N/ha

0.1243 t N/ha x 1000 = 124.3 kg N/ha within the above ground biomass

STEP 5. Root N content = 30% of the above ground N content

124.3 kg N/ha (above ground) x 0.30 (30%) = 37.3 kg N/ha within the crop roots

124.3 kg N/ha (above ground) + 37.3 kg N/ha (roots) = 162 kg N/ha total crop N content

'Step 6. 162 kg N/ha x 0.33 = 53.5 kg N/ha

Note: Numbers for above ground, roots and total crop content have been rounded.

FOR FURTHER INFORMATION PLEASE CONTACT

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