

INTERNATIONAL CONSORTIUM FOR SUGARCANE MODELLING

LIST OF MINIMUM AND *OPTIONAL* DATA REQUIREMENTS FOR THE VALIDATION OF THE DSSAT CANEGRO MODEL

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This document described the data requirements for the validation of the DSSAT Canegro model. It addressed the type of variables (and their units) to be measured in experiments and the format of electronic data files. Data requirements that are not compulsory are shown in italics. Please input your two best experimental datasets into the accompanying Excel spreadsheet and submit to Matthew Jones by 30 March 2007. We will probably comment and request further information before we prepare the data for the Validation Workshop to be held in Durban in July 2008.

1. SOIL

1.1. Description

1.1.1. Soil taxonomy (USDA)

1.1.2. Soil slope (%)

1.1.3. Soil colour

1.1.4. Residue type and amount

1.1.5. Stones (%)

1.1.6. Depth of impermeable layer (m)

1.1.7. Parent material

1.1.8. Comment on drainage and N mineralization properties

1.2. Properties:

1.2.1. Water retention properties (Saturated (SLSAT), drained upper (SLDUL) and lower (SLLL) limits of available water (units of volumetric fraction) at depths (SLB) where properties distinctly change.

1.2.2. Texture: Clay and silt fractions (SLCL, SLSI)

1.2.3. Max rooting depth (m)

1.2.4. *Bulk density (SBDM in g/cm³)*

1.2.5. Chemical analysis (P, K, Mg, Ca, NO₃, NH₄ content in ppm m/m)

1.2.6. *Total N (SNTOT) and C (SCTOT) at the start (% m/m)*

1.3. *Root density at monthly intervals (cm/cm³ in different layers)*

1.4. *Water content at weekly intervals (volumetric fraction in different layers)*
(Estimates at crop start essential)

2. PLANT

2.1. Phenology

2.1.1. *Dates of primary tiller emergence, start of stalk elongation, leaf and tiller appearance and senescence*

2.1.2. *Area of individual mature leaves on the primary tiller (cm²/leaf)*

2.1.3. *Tiller emergence and senescence (tillers per m²)*

2.1.4. Stalk height, stalk population at biweekly intervals

2.1.5. Canopy cover at biweekly intervals (%)

2.1.6. *LAI at biweekly intervals (m²/m²)*

2.2. Dry plant mass

2.2.1. Plant component mass (roots, millable stalk, leaf, meristem, stalk components) (t/ha or g/stalk) *at 3 monthly intervals*

2.2.2. Final stalk and stalk sucrose yield (t/ha)

2.2.3. Final green and dead leaf mass (t/ha)

3. WEATHER (DAILY)

3.1. Rainfall (mm/d)

3.2. *Solar radiation (MJ/m²/d), sunshine duration (h/d)*

3.3. Max and min temperature (°C)

3.4. *Max & min humidity (%)*

3.5. *Wind (km/d)*

3.6. A-pan evaporation (mm/d)

4. MANAGEMENT

4.1. Site: (Lat, Long, Altitude, *Slope, Aspect*)

4.2. Variety

4.3. Dates of establishment, sampling

4.4. Plant depth (cm), amount of seed cane (kg/ha)

4.5. Row spacing (m)

4.6. Fertilizer date, type (Composition, %) and amount (kg/ha)

4.7. Irrigation system (Overhead etc, typical application strategy (amount and cycle), spacing of emitter and dripper lines, application rate etc).

4.8. Irrigation dates and amounts (mm)

4.9. Ripener application date and type, amount

4.10. Presence of trash blanket

4.11. Trash blanket depth (at start and end)