**Supplementary Material**

**Table S1.** Basic statistics on RMSE (ton ha$^{-1}$) of the selected papers' models, where DM means Data Mining.

| Model Type | Model | Number of Papers | RMSE minimum (ton/ha) | RMSE average (ton/ha) | RMSE maximum (ton/ha) |
|---|---|---|---|---|---|
| Mechanistic | AQUACROP | 3 | 0.4 | 1 | 1.7 |
| | APSIM | 6 | 3.4 | 18 | 32.4 |
| | DSSAT | 5 | 5.2 | 13 | 24.6 |
| | FAO-AZM | 6 | 13.8 | 25 | 46.1 |
| | WOFOST | 2 | 6.7 | 9 | 12.7 |
| Hybrid | DM/FAO-AZM | 1 | 19.7 | 20 | 20 |
| Empirical | DM | 14 | 0.2 | 12 | 32.1 |

**Table S2.** Attributes based on field information.

| Acronym | Description | Reference |
|---|---|---|
| AGB | Above Ground Biomass | [23] |
| AGE | Crop Cycle | [30,31] |
| HARV_DATE | Harvest date | [12,31,32] |
| Irrig_status | Irrigation Status | [31] |
| TF-Ca | Calcium in leaf tissue | [24] |
| TF-K | Potassium in leaf tissue | [24] |

| | | |
|---|---|---|
| TF-N | Nitrogen in leaf tissue | [24] |
| N_HARV | Number of harvests | [12,30–32] |
| PE | Sugarcane production environment, according to [111] | [12] |
| SOIL_COD | Soil code, generated from the combination of suborder and soil group | [12] |
| SOIL_GR | Soil group: soil classification based on the chemical attributes of the subsurface horizon. | [12] |
| SOIL_ORD | Soil order: classification of the soil based on the clay content in the A and B horizons. | [12] |
| SOIL_SORD | Soil suborder: soil classification based on soil properties and horizons. | [12] |
| SURFC | Area of interest | [31] |
| VAR | Sugarcane Variety | [12,30–32] |
| ENA | Percentage of internodes attacked by caterpillars | [31] |
| SUC | Sugar Content | [31] |

**Table S3.** Attributes based on spectral bands and vegetation indices.

| Acronym | Description | Reference |
|---|---|---|
| APAR | Absorbed photosynthetically active radiation | [29] |

| | | |
|---|---|---|
| ARVI | Atmospherically Resistant Vegetation Index | [27] |
| BI | Bare Soil Index | [30] |
| BLUE | Spectral Band in Blue | [22,27] |
| CI | Chlorophyll Index Green | [30] |
| CIRE | Chlorophyll Index Red Edge | [4] |
| COASTAL/ AEROSOL | Spectral Band in Coastal/Aerosol | [27] |
| CWSI | Crop Water Stress Index | [29] |
| DVI | Difference Vegetation Index | [27] |
| EVI | Enhanced Vegetation Index | [11,12,26,27,30,31,80] |
| FPAR | Fraction of Photosynthetically Active Radiation | [26] |
| GCI | Green Chlorophyll Index | [27] |
| GNDVI | Green Normalized Difference Vegetation Index | [11,22,27,77] |
| GPP | Gross Primary Productivity | [26] |
| GREEN | Spectral Band in Green | [27] |
| GRVI | Green–Red Vegetation Index | [112] |
| LAI | Leaf Area Index | [25,26] |
| MCARI | Modified Chlorophyll Absorption in Reflectance Index | [80] |

| | | |
|---|---|---|
| MSAVI | Modified Soil Adjusted Vegetation Index | [11] |
| MTVI | Modified Triangular Vegetation Index | [80] |
| NDBI | Normalized Difference Built-up Index | [30] |
| NDMI | Normalized Difference Moisture Index | [12,27,30] |
| NDRE | Normalized Difference Red-Edge Index [113] | [22,80] |
| NDRE1 | Normalized Difference Red-Edge 1 Index [114] | [4] |
| NDSIs | Normalized Difference Spectral Indices | [32] |
| NDVI | Normalized Difference Vegetation Index | [4,11,12,22–31,80,115] |
| NDWI 1 | Normalized Difference Water Index [79] | [12,27] |
| NDWI 2 | Normalized Difference Water Index [116] | [12] |
| NG | Normalized Green | [27] |
| NIR | Spectral Band in the Near-Infrared | [12,22,27] |
| NN | Normalized Near Infrared | [27] |
| NR | Normalized Red | [27] |
| OSAVI | Optimized Soil Adjusted Vegetation Index | [27] |

| RED | Spectral Band in Red | [12,22,27] |
|---|---|---|
| RED_EDGE 1 | Spectral Band in RedEdge 1 | [12,22,27] |
| RVI | Ratio Vegetation Index | [27] |
| SAVI | Soil Adjusted Vegetation Index | [11,12,27] |
| SIRI | Short Wave Infrared Ratio | [11] |
| SR | Simple Ratio | [11] |
| SWIR1 | Spectral Band in Short-wave Infrared 1 | [12,27] |
| SWIR2 | Spectral Band in Short-wave Infrared 2 | [12,27] |
| Ts | Canopy Surface Temperature | [29] |
| VARI | Visible Atmospherically Resistant Index | [27] |
| VCI | Vegetation Condition Index | [83,115] |
| VOD | Vegetation Optical Depth | [112] |
| WDRVI | Wide Dynamic Range Vegetation Index | [22] |
| WS | Water Scalar | [23,80] |

**Table S4.** Attributes based on meteorological data.

| Acronym | Description | Reference |
|---|---|---|
| PPT | Precipitation | [12,26,30–32] |
| Rg | Global Radiation | [12,30–32] |

| | | |
|---|---|---|
| Tmax | Maximum temperature | [12,31,32,115] |
| Tmin | Minimum temperature | [12,31,32,115] |
| ET | Evapotranspiration | [26,30] |
| EP | Evaporation | [30,32] |
| ETP | Potential Evapotranspiration | [26,31] |
| RH | Relative Humidity | [12,31,115] |
| SPI | Standardized Precipitation Index | [12,26] |
| LE | Latent Heat Flux | [26] |
| CD | Presence of Cold day | [30] |
| CW | Presence of cold waves | [30] |
| DS | Presence of a dry season | [30] |
| ER | Effective rainfall on the day | [30] |
| HW | Heat waves on the day | [30] |
| HR | Heavy rainfall on the day | [30] |
| LR | Long rains on the day | [30] |
| VP | Vapour pressure | [32] |
| Trange | Temperature range | [31] |
| WS | Wind speed | [12] |
| GDD | Degree day | [30,31] |

**Table S5.** Attributes based on SAR data.

| Acronym | Description | Reference |
|---------|-------------|-----------|
| VH | Polarization from the C-band of the Sentinel-1 satellite | [32,80] |
| VV | Polarization from the C-band of the Sentinel-1 satellite | [32,80] |
| VV/VH | Ratio between VV and VH polarizations | [32,80] |

**Table S6.** Attributes based on terrain information.

| Acronym | Description | Reference |
|---------|-------------|-----------|
| DEM | Digital Elevation Model | [30,32] |
| Slope | Slope | [30,32] |
| MrRTF | Muti-res Ridge Top Flatness | [30] |
| ASP | Aspect | [32] |
| CURV | Curvature | [32] |
| MrVBF | Multi-res Valley Bottom Flatness | [30] |
| TWI | Total Wetness Index | [30] |

**Table S7.** Other attribute types.

| Acronym | Description | Reference |
|---------|-------------|-----------|
| RAD_DOSE | Radiation Adsorbed Dose | [30] |
| RAD_K | Gamma Radiometrics Potassium | [30] |

| RAD_Th | Gamma Radiometrics Thorium | [30] |
|---|---|---|
| RAD_TK | Th:K | [30] |
| RAD_U | Gamma Radiometrics Uranium | [30] |
| RAD_U2Th | U2:Th ratio | [30] |
| RAD_UK | U:K ratio | [30] |
| RAD_UTh | U:Th ratio | [30] |