**Miscanthus parameters for plant.dat**

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| --- | --- | --- | --- | --- |
| **Variable** | **Value** | **Description** | **Line** | **Reference** |
| ICNUM | 142 | Land cover/plant code | 1 | -- |
| CPNUM | MISG | Four character code to represent land cover/plant name | 1 | -- |
| IDC | 6 | Land cover/plant classification (perennial) | 1 | -- |
| BIO\_E | 41.00 | Radiation use efficiency or biomass energy ratio ((kg/ha)/(MJ/m2)) | 2 | Cibin et al., 2014 |
| HVSTI | 1.00 | Harvest index for optimal growing conditions | 2 | Cibin et al., 2014; Trybula et al., 2014; Ng et al., 2011 |
| BLAI | 11.00 | Maximum potential leaf area index | 2 | Cibin et al., 2014 and Trybula et al., 2014 |
| FRGRW1 | 0.10 | Fraction of plant growing season corresponding to 1st point on optimal leaf area development curve | 2 | Cibin et al., 2014 and Trybula et al., 2014 |
| LAIMX1 | 0.10 | Fraction of maximum leaf area index corresponding to the 1st point on optimal leaf area development curve | 2 | Cibin et al., 2014 and Trybula et al., 2014 |
| FRGRW2 | 0.45 | Fraction of plant growing season corresponding to 2nd point on optimal leaf area development curve | 2 | Cibin et al., 2014 and Trybula et al., 2014 |
| LAIMX2 | 0.85 | Fraction of maximum leaf area index corresponding to the 2nd point on optimal leaf area development curve | 2 | Cibin et al., 2014 and Trybula et al., 2014 |
| DLAI | 1.10 | Fraction of growing season when leaf area begins to decline. | 2 | Cibin et al., 2014 and Trybula et al., 2014 |
| CHTMX | 3.50 | Maximum canopy height (m) | 2 | Cibin et al., 2014 and Trybula et al., 2014 |
| RDMX | 3.00 | Maximum root depth (m) | 2 | Cibin et al., 2014 and Trybula et al., 2014 |
| T\_OPT | 25.00 | Optimal temperature for plant growth (C) | 3 | Cibin et al., 2014 and Trybula et al., 2014 |
| T\_BASE | 8.00 | Minimum temperature for plant growth (C) | 3 | Cibin et al., 2014 and Trybula et al., 2014 |
| CNYLD | 0.0035 | Normal fraction of nitrogen in yield (kg N/kg) | 3 | Cibin et al., 2014 and Trybula et al., 2014 |
| CPYLD | 0.0003 | Normal fraction of phosphorus in yield (kg P/kg) | 3 | Cibin et al., 2014 and Trybula et al., 2014 |
| PLTNFR(1) | 0.01 | Nitrogen uptake parameter #1: normal fraction of nitrogen in plant biomass at emergence (kg N/kg biomass) | 3 | Cibin et al., 2014 and Trybula et al., 2014 |
| PLTNFR(2) | 0.0065 | Nitrogen uptake parameter #2: normal fraction of nitrogen in plant biomass at 50% maturity (kg N/kg biomass) | 3 | Cibin et al., 2014 and Trybula et al., 2014 |
| PLTNFR(3) | 0.0057 | Nitrogen uptake parameter #3: normal fraction of nitrogen in plant biomass at maturity (kg N/kg biomass) | 3 | Cibin et al., 2014 and Trybula et al., 2014 |
| PLTPFR(1) | 0.0016 | Phosphorus uptake parameter #1: normal fraction of nitrogen in plant biomass at emergence (kg P/kg biomass) | 3 | Cibin et al., 2014 and Trybula et al., 2014 |
| PLTPFR(2) | 0.0012 | Phosphorus uptake parameter #2: normal fraction of nitrogen in plant biomass at 50% maturity (kg P/kg biomass) | 3 | Cibin et al., 2014 and Trybula et al., 2014 |
| PLTPFR(3) | 0.0009 | Phosphorus uptake parameter #3: normal fraction of nitrogen in plant biomass at maturity (kg P/kg biomass) | 3 | Cibin et al., 2014 and Trybula et al., 2014 |
| WSYF | 1.000 | Lower limit of harvest index ((kg/ha)/(kg/ha)) | 4 | Cibin et al., 2014; Trybula et al., 2014; Ng et al., 2011 |
| USLE\_C | 0.0030 | Minimum value of USLE C factor for water erosion applicable to the land cover/plant. | 4 | Cibin et al., 2014; Trybula et al., 2014; Ng et al., 2011 |
| GSI | 0.0050 | Maximum stomatal conductance at high solar radiation and low vapor pressure deficit (m\*s^-1) | 4 | Cibin et al., 2014 and Trybula et al., 2014 |
| VPDFR | 4.00 | Vapor pressure deficit (kPa) corresponding to the second point on the stomatal conductance curve | 4 | Cibin et al., 2014 and Trybula et al., 2014 |
| FRGMAX | 0.750 | Fraction of maximum stomatal conductance corresponding to the second point on the stomatal conductance curve | 4 | ? |
| WAVP | 8.50 | Rate of decline in radiation use efficiency per unit increase in vapor pressure deficit | 4 | Cibin et al., 2014 and Trybula et al., 2014 |
| CO2HI | 660.00 | Elevated CO2 atmospheric concentration (microL CO2/L air) | 4 | ? *not required* |
| BIOEHI | 54.00 | Biomass-energy ratio corresponding to 2nd point on the radiation use efficiency curve | 4 | ? *not required* |
| RSDCO\_PL | 0.0500 | Plant residue decomposition coefficient | 4 | Cibin et al., 2014; Trybula et al., 2014; Ng et al., 2011 |
| ALAI\_MIN | 0.000 | Minimum leaf area index for plant during dormant period (m2/m2) | 4 | Cibin et al., 2014; Trybula et al., 2014; Ng et al., 2011 |
| BIO\_LEAF | 0.000 | Fraction of tree biomass accumulated each year that is converted to residue during dormancy | 5 | ? *not required* |
| MAT\_YRS | 0 | Number of years required for tree species to reach full development (years) | 5 | ? |
| BMX\_TREES | 0.00 | Maximum biomass for a forest (metric tons/ha) | 5 | ? |
| EXT\_COEF | 0.550 | Light extinction coefficient | 5 | Cibin et al., 2014 and Trybula et al., 2014 |
| BMDIEOFF | 0.100 | Biomass dieoff fraction | 5 | ? |

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**Miscanthus operational schedule parameters for MISG\_base.txt**

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Operation: **Tillage** – recommended before planting operation, to at least a depth of 6 inches (Heaton et al., 2011; Heaton and Wilson, 2013). Usually 2-3 weeks prior to planting. Part of weeding approach?

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| --- | --- | --- | --- | --- | --- |
| Variable | value | description | Position | Format | Reference |
| MONTH | 5 |  | Space 2-3 | 2-digit integer | Heaton et al., 2011; Heaton and Wilson, 2013 |
| DAY | 1 |  | Space 5-6 | 2-digit integer | Heaton et al., 2011; Heaton and Wilson, 2013 |
| MGT\_OP | 6 | Tillage | Space 17-18 | 2-digit integer | -- |
| TILL\_ID | 6 | Fldcge15: till field cultivator. From tillage database (see pg 597 Appendix A.2). | Space 20-23 | 4-digit integer |  |

Operation: **Planting** – recommended on or around May 1st (when temps are around 50 C), similar to planting schedule of corn (Heaton et al., 2011; NRCS USDA, 2011; Heaton and Wilson, 2013; Trybula et al., 2014). Recommended not to apply fertilizer in the first two years (Caslin, Finnan, and McCracken 2010; NRCS USDA, 2011). No fertilizer is required during the first establishment year (Heaton and Wilson, 2013).

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| --- | --- | --- | --- | --- | --- |
| Variable | value | description | Position | Format | Reference |
| MONTH | 5 |  | Space 2-3 | 2-digit integer | Heaton et al., 2011; Trybula et al., 2014 |
| DAY | 13 |  | Space 5-6 | 2-digit integer | Trybula et al., 2014 |
| MGT\_OP | 1 | Planting/beginning of growing season | Space 17-18 | 2-digit integer | -- |
| PLANT\_ID | 142 | Plant identification number from plant.dat | Space 20-23 | 4-digit integer | -- |
| HEAT UNITS | 1830.00000 | Total heat units for plant to reach maturity | Space 32-43 | Decimal (xxxxxx.xxxxx) | Trybula et al., 2014 |

Operation: herbicides within first year? (Anderson et al., 2010, Heaton and Wilson, 2013)

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| Variable | value | description | Position | Format | Reference |
| MONTH |  |  | Space 2-3 | 2-digit integer |  |
| DAY |  |  | Space 5-6 | 2-digit integer |  |
| HUSC |  |  | Space 8-15 | Decimal (xxxx.xxx) |  |
| MGT\_OP |  |  | Space 17-18 | 2-digit integer |  |
|  |  |  |  |  |  |
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Operation: **fertilizer application** – applied once a year around early-mid after 1st establishment year; Agrotain®-coated urea (Heaton et al., 2011; Trybula et al., 2014)

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| Variable | value | description | Position | Format | Reference |
| MONTH | 5 |  | Space 2-3 | 2-digit integer |  |
| DAY | 15 |  | Space 5-6 | 2-digit integer | Trybula et al., 2014 |
| MGT\_OP | 3 | Fertilizer application | Space 17-18 | 2-digit integer | -- |
| FERT\_ID | 4 | Fertilizer identification number from fertilizer database; urea | Space 20-23 | 4-digit integer | -- |
| FRT\_KG | 23.00000 | Amount of fertilizer applied to HRU (kg/ha) | Space 32-43 | Decimal (xxxxxx.xxxxx) | based on switchgrass (Sundar et al., ) |
| FRT\_SURFACE | 0.00 | Fraction of fertilizer applied to top 10mm of soil (if set to 0, model applied 20%) | Space 45-50 | Decimal (xxx.xx) | based on switchgrass (Sundar et al., ) |

Operation: **harvesting –** optimal when crop is dry enough for storage (<20% moisture); moisture curve for g. miscanthus in Illinois is 50% in October through 10% by Febrary (NRCS USDA, 2011; Heaton et al., 2011). Harvest leaving 2-4 inch stubble to maximize biomass yield (Heaton et al., 2010; NRCS USDA, 2011). Don’t harvest in first year of growth (Heaton and Wilson, 2013).

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| Variable | value | description | Position | Format | Reference |
| MONTH | 10 |  | Space 2-3 | 2-digit integer | Heaton et al., 2011; Trybula et al., 2014 |
| DAY | 31 |  | Space 5-6 | 2-digit integer | Heaton et al., 2011; Trybula et al., 2014 |
| MGT\_OP | 7 | Harvest only (no kill) | Space 17-18 | 2-digit integer | -- |
| IHV\_GBM | 0 | Biomass harvest | Space 25-27 | 3-digit integer | -- |
| HARVEFF | 0.7 | Harvest efficiency | space 32-43 | Decimal (xxxxxx.xxxxx) | Trybula et al., 2014 |
| HI\_OVR | 1 | Harvest index override ((kg/ha)/(kg/ha)) | Space 45-50 | Decimal (xxx.xx) | Trybula et al., 2014 |

Management schedule: 10 years of rotation

Year 1: Tillage, (herbicide application if possible), planting in early May (in Midwest)

Year 2: (herbicide application if possible), fertilizer application (early/mid May)

Year 3: fertilizer application (little-none required after establishment period)

Years 4-9: harvest annually in late October (no kill)

Year 10: harvest and kill (MGT\_OP = 5).

VERSION 2:

Management schedule: 10 years of rotation

Year 1: planting in early May (in Midwest)

Year 2: (herbicide application if possible), fertilizer application (early/mid May)

Year 3: fertilizer application (little-none required after establishment period)

Years 4-9: harvest annually in late October (no kill)

Year 10: harvest and kill (MGT\_OP = 5).

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