MAIZSIM uses a number of files for input and output. The names of these files are contained in a master file that is read in by MAIZSIM on the command line at runtime. The files are typically specified with the full path so they can be read in from any folder. The filename variable however, is limited to 132 characters. If the file name and path are longer, the name will be truncated and MAIZSIM will give an error. The file names have to be specified in a specific order as given here.

Spacing between entries on a line is not important, we use free-form input. However, dates must be enclosed with a single “’” as in ‘10/25/2006’

We are working on an interface to automatically generate these files and allow variation of parameters.

Irrigation now should be included in the rainfall column of the weather file. In the future we will implement a subroutine for irrigation.

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| Filename (Files can be given any name – the names given here are for illustration) | Purpose | Notes |
| Weather.dat | Weather information, can be daily or hourly. As a minimum you need solar radiation (MJ), temperature (C), and precipitation. Averages can be used for windspeed and RH can be calculated | This is specific for a year and location |
| Time.DAT | Provides information for time synchronization in 2dsoil. Contains parameters for controlling the time step in the finite element soil model. It also contains a flag to use daily or hourly weather data or to output variables as hourly or daily | The initial time or start time for the simulation is set here. This is the most commonly used variable. Also the flags for weather and output. The other variables do not normally need to be changed |
| Biology.DAT | Contains parameters for the soil nitrogen module. These parameters control carbon and nitrogen dynamics in organic matter | These parameters only need to be set when simulating soil organic matter dynamics. The materials refer to layers and one should insure that if there are 5 layers in the soil file, there are 5 layers here as well. This is true even if not simulating soil organic matter dynamics |
| Climate.DAT | This is a climate header file. The parameters are site and weather file specific | Check the documentation for a full description of this file. Many of the parameters will have to be changed to fit the simulation – these are location and weather data specific – such as latitude and longitude, and units of the weather data |
| Nitrogen.dat | This contains parameters for the nitrogen/carbon dynamics – specifically rate constants for decay. It also contains a row spacing parameter needed for mass balance calculations. This will be removed from the file at a later date. Each soil layer has a line of data | Make sure the file has the same number of layers (materials) as the soil file. Change the row spacing. The other parameters can remain as default.  This is not usually scenario specific. |
| Solute.DAT | This contains parameters that control solute transport. These include the dispersivity and diffusion. Dispersivity is affected by soil pores so it will vary with soil properties. Therefore there are entries for the different layers. The main solute is Nitrogen though the soil model (2dSoil) can handle more than one solute (we intend to add phosphorus later). | Only the number of layers must be consistent with the soil file. The diffusion of N is a general parameter and does not need to be changed. If you have information on how porosity affects diffusivity you can add it here. Units and ranges will be in the documentation.  This is not usually scenario specific |
| Soil.Soi | This file contains the soil properties, one line for each layer of data. We use van Genuchten’s equation but we can compile additional code to use Campbell’s equation or another relationship | This file is simulation scenario specific |
| Management.DAT | Contains Nitrogen application rates and times | The rate is for the “slab”, see the documentation for more information. In the future, we will make the rate Kg per hectare. This file is simulation scenario specific |
| Water.DAT | This file contains parameters for the water and heat movement and solute transport models in 2DSOIL. The parameters are fully described in the 2DSOIL documentation | This file is general and is only changed if there are convergence problems. |
| WaterBound.DAT | This file defines time dependent nodal boundary conditions for the model. It can be used for applying drip irrigation or node dependent evaporation/transpiration. See the 2DSOIL documentation | This file is not used unless there are time dependent boundary conditions. These are not common |
| initial01.ini | This is the initials file for the plant model and defines agronomic conditions. It defines things like the start and stop times for the plant model, planting date, auto irrigation, plant density, whether or not to output soil files, seed planting depth, etc | It is scenario dependent and is usually modified for a simulation |
| Hybrid.var | This file contains variety specific information for the shoot and roots. The GDD to maturity and number of leaves are the only parameters that are usually changed, the other parameters have been shown to be consistent for temperate varieties. The water uptake and root parameters are consistent over varieties and do not need to be changed. The ISINK parameter is used to define what kind of uptake model is used but is usually kept at 0. | Only change GDD to maturity, and number of leaves at maturity for a parameter |
| Grid.grd | Grid file – defines the 2D finite element grid (made up of nodes) | Can use a standard grid if the depths are OK. The grid defines a specific layering of soil also. I have a program to generate a grid if necessary. |
| Node.nod | Node file – defines the initial conditions of the nodal points | Corresponds to a grid file. Can be generated |
| Element.elm | Defines the root connections | Corresponds to a grid file. We plan to remove this file in the future |
| MassBl01.dat | Gives dates for output of detailed mass balance info | File is not used now, i.e., no output is produced – for future development |
| out01.g01 | Out file for plant (units are grams per plant) |  |
| out01.g02 | Out file of detailed leaf data |  |
| out01.g03 | Out file for nodal information in the soil |  |
| out01.g04 | Out file for element information (roots, water uptake) |  |
| out01.g05 | Out file of soil water and ET summary, units are cm cm-2 |  |
| out01.g06 | Outfile of |  |
| MassBl01.out | Gives the mass balance of Nitrogen and water in the domain. N is in Kg per ha and water is in grams per slab |  |
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