**How to add a new crop in the SIMPLE?**

To make it easy to add a new crop in the SIMPLE, we add dummy files or experiments for a new crop. You only need to replace the dummy files/data with your own step by step. In each step, you can test run the SIMPLE to ensure your files are correct. The dummy data is included in the following files:

1). Input\Simulation Management.csv

2). Input\Species parameter.csv

3). Input\Cultivar.csv

4). Input\Treatment.csv

5). Input\Irrigation.csv

6). Input\Soil.csv

7). Observation\Obs\_dummy crop\_Exp name.csv

8). Weather\dummy weather.WTH

**Nine steps to add a new crop in the SIMPLE:**

1. Replace the dummy **crop name** with your crop name (the crop name should be in lower case) in the following files:

1). Input\Simulation Management.csv

2). Input\Species parameter.csv

3). Input\Cultivar.csv

4). Input\Treatment.csv

5). Input\Irrigation.csv

6). Observation\Obs\_dummy crop\_Exp name.csv

Then run SimpleB to make sure no error occurs, and the output figure shows the correct crop name.

2. Replace the dummy **experiment name** with your experiment name in the following files:

1). Input\Simulation Management.csv

2). Input\Treatment.csv

3). Input\Irrigation.csv

4). Observation\Obs\_dummy crop\_Exp name.csv

If you have the label name for the experiment, also replace the dummy label name with you own one in above 1) and 2) file. Then run SimpleB to make sure no error occurs, and the output figure shows the correct experiment/label name.

3. Replace the dummy **observation data** with your own one in the Observation/ Obs\_dummy crop\_Exp name.csv. In the observation file, make sure there are at least one number for each column of yield/FSolar/Biomass, and observed yield number must be shown in the last row. If there are no observations for one of the variables, just replace them with 0.

FSolar can be calculated from LAI as FSolar =1-EXP(-k\*LAI). Run SimpleB to make sure no error occurs, and the output figure shows the correct observations.

4. Replace the dummy **Species parameters** with the new crop parameters in the Input\Species parameter.csv. The parameters could be derived from accepted values in the literature, or from other crop models if they existed, or estimated in relation to crops with known parameters. Run SimpleB to make sure no error occurs.

5. Switch the dummy **water stress option** in the Input/Simulation Management.csv.

1). **a)** If no water stress in your experiments, replace the “Yes” with “no”.

**b)** If there is water stress in your experiments, keep the “Yes” option and open the Input\Treatment.csv, add the treatment number in ‘IrrigationTrt’ column and replace the dummy irrigation data with your own one in the Input\Irrigation.csv.

2). Run SimpleB to make sure no error occurs, and check the output file whether the water stress is included.

6. Replace the dummy **soil** name with your own in Input\Treatment.csv and Input\Soil.csv. Run SimpleB to make sure no error occurs.

Replace the dummy soil parameters with your own in Input\Soil.csv, then run SimpleB to make sure no error occurs.

7. Replace the dummy **cultivar name** with your own in Input\Treatment.csv and Input\Cultivar.csv. Run SimpleB to make sure no error occurs.

Replace the dummy cultivar parameters with your own in Input\ Cultivar.csv, then run SimpleB to make sure no error occurs.

8. Replace the dummy **management/initial data** with your own in Input\Treatment.csv.

1) CO2

2) MaxIntercept

3) InitialBio

4) InitialTT

5) InitialFsolar

Run SimpleB to make sure no error occurs.

9. Replace the dummy **weather** name with your own in Input\Treatment.csv and also replace the file name of Weather\dummy weather.WTH. Run SimpleB to make sure no error occurs.

Replace the contents of the weather file with your own in the same format, and replace the dummy sowing date and harvest date (YYDOY format; if harvest at maturity, keep it blank; if harvest before maturity, fill in your harvest date) with your own data in Input\Treatment.csv.

Run SimpleB to make sure no error occurs.