***All plant carbon in the plant model is expressed as grams dry matter (carbohydrate) per plant per hour.***

***All root carbon in the soil part is grams dry matter per slab per day***

The gas exchange module calculates photosynthesis as umol CO2 per meter squared leaf area per second. the variable *assimilate* as shown below is converted to grams carbohydrate per plant per hour. Since the plant model works on an hourly time step this is the total dry matter produced in that one hour.

This is the carbon trail in Maizsim:

1. In module calcGasExchange assimilate is calculated this way (from the photosynthesis - gas exchange module).

assimilate = (photosynthesis\_gross\*CO2\_MW/1.0e6)\*(60.0\*initInfo.timeStep)/initInfo.plantDensity;

/ / grams CO2 per plant per hour

**assimilate is grams co2 per plant per hour (in the comment)**

1. in module update (again plant.cpp)

C\_pool += assimilate\*CH2O\_MW/CO2\_MW; // convert from grams CO2 to grams carbohydrate (per hour per plant)

**C\_pool is now grams dry matter (carbohydrate) per hour per plant**

1. In C\_allocation:

C\_supply = \_\_max(C\_pool\*tmprEffect\*grofac, 0); //CADD from Grant

Same units as C\_pool -> grams dry matter per hour per plant

1. Later in C\_allocation

shootPart = \_\_max(0, 0.67\*(C\_supply-maintRespiration)); //these are the amount of carbons allocated with no drought stress

rootPart = \_\_max(0, 0.33\*(C\_supply-maintRespiration)); //Yang, 6/22/2003

shootPart and rootPart are same units as C\_supply -> **grams dry matter per hour per plant**

in crop.cpp

SHOOTR->PCRL=(pSC->getPlant()->get\_rootPart()+pool)\*24\*PopSlab;

**Carbon is now passed to the soil model as grams of dry matter per slab per day. This is the total**

note that the time step for the plant model is 1 hour thus the 1 hour rate is the same as the total mass of dry matter. 2DSOIL must iterate for time steps smaller than an hour. Thus all carbon calculations in 2DSOIL must be integrated over time.

The variable HourlyCarboIncrement is summed over the hour in 2dsoil and is a sum of the actual carbon used to grow roots. In 2dsoil the units are total grams dry matter per slab used in **1 hour.** Thus when returned to the crop model it is scaled to **grams dry matter per plant per hour.** This value is then added to the rootMass variable that holds grams root dry matter per plant.