**4 parameters of interest:**

* Biomass of storage organs
* Volumetric water content
* Root depth

-superimpose volumetric water content and root depth-> because water takes time to reach the root level

* Tranrf: tranRF= 1 (no water stress)

Data:

typical sandy loam soil, weather data is from the NUTS2 region AT11 (Burgenland, Austria). Crop: spring wheat

Useful notes:

Ctrl + shift (overlay graphs)

**Tasks:**

* Find best scheduling (using the regular irrigation schedule with 2 irrigation times per year)

-explain the science, logic, and theories behind

-express the limitations encountered

-complete documentation of runs

-raw data files and graphs for presentation

* Best scheduling with modified settings per year (modified .csv irrigation schedule)
* Recommendations for future improvements

**Concepts:**

A picture containing diagram, text, line, plot

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Source: https://www1.agric.gov.ab.ca/$department/deptdocs.nsf/ba3468a2a8681f69872569d60073fde1/fd89ad4f75f8525b8725786b004fa8d5/$FILE/112\_561-2.pdf

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Source: https://ipad.fas.usda.gov/rssiws/al/crop\_calendar/europe.aspx

## **Delegation of tasks:**

Run a model with and without water stress. Compare the annual yields and try to compensate yield loss by irrigation. The yearly yields should always be more than 90% of the potential yearly yields.

Calculate the overall water use efficiency (sum of yields divided by sum of irrigation amounts) and try to maximize it by varying amounts and irrigation dates. Consider only those simulations as valid, where the yearly yields are at least 90% of the potential ones.

For all the runs, please use the ideal template Gunther showed in class, so we will have no problems following the settings. Please organize all the files and runs in the github repository.

Task 1: optimal condition (without water stress) and worst case scenario (0 irrigation for irrigation days 1 and 2)

* Calculate exact values for **biomass accumulation for best case (ideal cumulative biomass**) and worst case scenario (data already available in git hub repository under ‘nostress’ folder and ‘with water stress’ folder containing the ‘1\_0.0\_1\_0.0’ files)

Task 2: water stress

Using water use schedule per **crop stage, soil type water retention, and cropping calendar** (graphs shown above in this document) for spring wheat, determine most likely irrigation schedule. Do runs within 30% around those settings (water input) to find best setting

* Identify where the best biomass growth is with least water supplied (within 90% of ideal cumulative biomass)
* Identify when the time water reaches root needs adjustment

Task 3: water stress with yearly set water irrigation schedule

Using data from task 2, craft schedule with yearly change