2DSPUD, a Two-dimensional Mechanistic Model of Potato Growth and Development. (A03-timlin121654-Poster)

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Abstract:

Potato is an intensively managed crop that requires large amounts of nutrients and water. Potato is also planted on hills or ridges which imposes a strong two-dimensional structure to infiltration and runoff. We are currently developing a mechanistic potato simulation model that will provide information on crop development stage, the need to irrigate and expected time to harvest as well as provide estimates of nitrogen fertilizer requirements. Experimental data on growth and development of potato under different environmental conditions were collected from indoor and outdoor controlled growth chambers, and from field plots. We can control carbon dioxide, temperature and water application to develop rate equations to model growth and development processes under a range of environmental conditions. The plant model was developed from SIMPOTATO with more detail in the photosynthetic component. The soil processes are simulated by 2DSOIL, a modular water and solute transport model that was adapted from SWMS_2D, SOIL-N and GLYCIM. 2DSOIL is a two dimensional model using an finite element description of solute and water flow. Results on phenology and photosynthesis are shown.

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