

Table 3. Brief summary of problems resulting from water deficit or excess in soil moisture as percent Field Capacity (FC) based on production period.  
 (based on Curwen, 1994 and personal communications; see Figure 3)

Production Period & Plant Growth Phases	Preferred Soil Moisture	Moisture Deficit Effects	Moisture Excess Effects
Pre-Plant: preparation	70-80% FC	soil clumping poor root growth	muddy soil and delayed planting
Pre-Emergence: Root = lag-log phase Canopy = lag phase	65-80% FC	poor seed healing poor sprouting poor root growth susceptible to rot	poor seed health poor sprouting poor root branching high soil pathogens
Pre-Tuber Initiation: Root = log phase Canopy = log phase	70-80% FC	poor root growth poor canopy growth late tuberization	poor root branching stolon/stem canker blackleg on stolon
Tuber Initiation: Root = flat phase Canopy = log phase Flower = blooming Tuber = lag phase	80-90% FC	leaf aging and wilt early blight common scab late tuberization tuber mis-shaping tuber sugar-ends	leaf aging hollow heart blackleg early blight early dying late blight danger
Tuber Bulking: Canopy = flat phase Tuber = log phase	80-90% FC	leaf aging and wilt wilt diseases early dying early blight brown spot common scab poor tuber growth tuber mis-shaping	leaching N swollen lenticels hollow heart blackleg late blight soft rots (field) white mold
Plant Senescence: Canopy = dying Tuber = maturing	60-70% FC	poor tuber maturity late skin set high skin peeling poor skin russetting high bruising (IBS)	soft rots (storage) tuber early blight high shatter bruise
stolon and stem cankers = <i>Rhizoctonia solani</i> ; blackleg = <i>Erwinia carotovora</i> ; early blight = <i>Alternaria solani</i> ; common scab = <i>Streptomyces scabies</i> ; early dying = complex, primarily <i>Verticillium dahliae</i> ; late blight = <i>Phytophthora infestans</i> ; wilt diseases = includes <i>Fusarium</i> , <i>Rhizoctonia</i> , and <i>Verticillium</i> wilts; brown spot = <i>Alternaria alternata</i> ; soft rots = include <i>Erwinia carotovora</i> (bacterial soft rot), <i>Phytophthora erythroseptica</i> (pink rot), and <i>Pythium</i> spp. (leak); white mold = <i>Sclerotinia sclerotiorum</i> .			