Abstract:

Total soluble protein (TSP) concentration and distribution was determined for 20 cultivars (cvs.) of both fresh and stored potato tubers from the 2000 and 2001 growing seasons. A subset of 7 cvs. was used to compare the concentration and distribution of TSP between fresh field-grown tubers and microtubers. TSP concentration was quantified separately in three tissue layers (periderm, cortex and pith) using the Bradford method. In most cvs., the TSP concentration on a dry weight (DW) basis was greater in the periderm compared with the cortex and pith. The TSP concentration in fresh field-grown tubers ranged from 38 to 73 mg g^{-1} DW in the periderm compared with 30 to 49 mg g^{-1} DW in the cortex and pith. After 6 months of tuber storage, the TSP concentration was unchanged in eleven cvs., decreased (mean of 16%) in five cvs. and increased (mean of 18%) in four cvs. While the relative TSP concentration in the tissues tended to be distributed in a similar pattern for each cv., whether fresh or stored, concentrations were greater in microtubers than in fresh field-grown tubers; possibly a function of the readily available nitrogen in the tissue culture medium. These results suggest avenues for identifying and selecting genotypes with increased protein concentrations and improved nutritive value.