McGRATH, J. MITCHELL, USDA, Agricultural Research Service, Dept. of Crop and Soil Sciences, Michigan State University, East Lansing, MI 48824-1325. Total protein profiles in sugarbeet tissues revealed from one-dimensional SDS-PAGE.

Protein extracts of tissues can be directly applied to a protein-denaturing solid matrix sieve and separated according to molecular weight in a voltage gradient via SDS-polyacrylamide electrophoresis (SDS-PAGE). The resulting separation of proteins can be used to gauge the complexity of proteins expressed in different tissues, such as leaf, flower or root, as well as to follow changes in protein composition during development. We have begun to examine sugarbeet tissues for differences in total protein profiles. Within population variability was minimal or absent for detectable leaf proteins among three to nine plants each of EL48, SR80, EL576-0 and 576-01. Similar results were obtained with total root protein extracts. Root, crown and leaf profiles from EL48, EL576-0 and EL576-01 at different developmental stages (20, 12 and 2 weeks) showed no detectable variation in profiles during development or between similar tissues. Major differences were detected between root and leaf proteins in all cases, with root proteins showing less complexity and abundance than leaf proteins. Diversity in leaf proteins was examined in three sugarbeet accessions (Beta 5931, SR80 and EL48), five *Beta vulgaris* var. *maritima* (PI 540625, PI 546523, PI 504196, PI 546409 and WB326) and one *Beta lomatogona*. All accessions had substantially similar protein profiles, with SR80 showing variation in band intensity relative to similar bands in other accessions. Flower buds and leaf extracts showed substantially similar patterns with two notable exceptions. First, a 95 Kd protein was observed in pollen-producing flower buds from EL48, SR80 and EL576-0 (an O-type) but not in cytoplasmic male sterile (CMS) lines EL576-01 or SLC-03. This protein was observed in pollen extracts and was not detected in immature buds. Second, a protein of 25 Kd appeared to accumulate to high levels in CMS lines and immature fertiles. Both differences were more apparent in extracts of excised anthers.

ABSTRACT of talk given at ASSBT meeting, Phoenix, AZ March 1-5, 1997.