HALLOIN, JOHN M.[1*], and J. CLAIR THEURER[2]. ARS, USDA, Sugarbeet and Bean Research Unit, Departments of [1]Botany and Plant Pathology, and [2]Crop and Soil Science, Michigan State University, East Lansing, MI 48824. Procedure modifications for operation of the *Rhizoctonia* crown and root rot nursery in East Lansing, Michigan.

ABSTRACT

Two changes have been made in the operation of the *Rhizoctonia* crown and root rot nursery at East Lansing, MI. An alternative disease rating system has been developed for scoring of disease in association with resistance breeding, and the crop rotation sequence has been changed to facilitate establishment of epiphytotics.

The new rating system is non linear, providing numerical expansion of those categories exhibiting little rot. Roots are scored as follows: 0 = no evidence of disease, 1 = few isolated, superficial lesions; 2 = lesions more abundant and coalescing, to cover up to 10% of the root surface; 3 = up to 30% of the root surface rotted, with rot often extending into tissues; and 4 = crowns dead or more that 30% of the root rotted. The new system should be better for selection of disease resistant germplasms. In practice, materials selected for resistance are those roots with less than 10% rot, and this non linear system should to provide better numerical discrimination among those roots. While not useful for disease loss estimates, this non linear system should provide better numerical discrimination for selection of resistant roots for breeding, than a linear scoring method. We use a linear rating system for disease loss estimates.

The site used for the disease nursery has been employed for that purpose for more than 20 years. In recent years we have had difficulty producing disease severe enough to discriminate resistant from partially resistant germplasms. The nursery employs a two year rotation between sugarbeets and alfalfa; and annually the sugarbeets are inoculated six weeks after planting, by dispensing into their crowns, millet caryopses on which the fungus has been grown. Experiments were done to determine if biological control of the pathogen was responsible for low disease severity. Highly susceptible to highly resistant sugarbeet genotypes were planted in the established *Rhizoctonia* disease nursery and in an adjacent field with no prior use as a root rot disease nursery. In two of three years, the disease was more severe at the new sites than in the established nursery. Inoculated plants at the new sites also were more stunted. Biological control of *Rhizoctonia* seems a likely cause of the decreased disease severity in the established nursery. The crop rotation for the site is being changed to a three year rotation of sugarbeets/oats/navy beans, in an attempt to reduce the apparent effects of biological control of *Rhizoctonia*.