EVALUATION OF MUSTARD GERMPLASM AS GREEN MANURES. Christopher Gittings and John B. Masiunas, Undergraduate Research Associate and Associate Professor, Univ. of Illinois, 1201 West Gregory Dr., Urbana, IL 61801.

Crucifer green manures have potential as biofumigants to suppress weeds emerging with crops. The primary mechanism for weed suppression by crucifer residues is the hydrolysis by myrosinase (thioglucoside glucohydrolase, EC 3.2.3.1) of glucosinolates to D-glucose, sulfates and a number of active allelochemicals such as isothiocyanates, nitriles, thiocyanates. In crucifer tissues, myrosinase is normally segregated from glucosinolates but when cells are damaged, myrosinase is released. Crucifers differ in their glucosinolate profile with more than a hundred thirty glucosinolates varying in their side chains and weed suppression existing. Crucifer genotypes with higher concentrations of glucosinolates or exposure to environmental stress (i.e. drought, high temperatures, insect feeding) that elevates levels of glucosinolates may result in better weed suppression. The objectives of our research were to identify accessions that have the best germination and growth under Midwestern U.S. conditions and to determine the alleopathic activity of their water extracts. We hypothesize that the best accessions for further development are those with good emergence, large biomass, and suppessive water extracts. Accessions were obtained from the crucifer germplasm collection in Ames, IA and commercial seed companies (Seeds of Change, High Performance Seeds, Siegers Seeds, Rispens Seeds, Harvest Moon Seeds, Southern Exposure Seeds, and Native Seeds). We evaluated: 22 accessions in *B. juncea*, 10 accessions in *Brassica napus*, 3 accessions in *B. rapa*, 3 accessions in *B. nigra*, 3 accessions in *Sinapis arvensis*, 2 accessions in *Camelina sativa*, 2 accessions in *Eruca sativa*, and 1 accession in each of the following species *Biscutella lustianica*, *B. frutescens*, *B. sempervirens*, *Brassica barrelieri*, *B. campestris*, *B. kaber*, *B. oxyrrhini*, *B. tournefortii*, *Enarthrocarpus arcuatus*, *Eruca pinnatifida*, *Erysimum cheiranthoides*, *Sinapis alba*, and *Sinapis flexuosa*. On August 22, mini-plots (.09 m^2) were established in Champaign in a randomized complete block design with 5 replications. The number of plants and dry mass were determined six weeks later. The accessions in *Camelina sativa*, *Biscutella lustianica*, *B. frutescens*, and *Erysimum cheiranthoides* did not emerge in any replication. The accessions with the greatest biomass/ plant were *Brassica juncea* 'Florida Broadleaf', *Brassica napas* var. *napus* 'Ames 26655' and *Brassica napas* 'PI 305280'. The accessions also differed in the allelopathic activity of their water extracts against cress and annual ryegrass in a Petri dish bioassay. Our results indicate that promising accessions exist which merit further evaluation in field studies.

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