SUMMER ANNUAL COVER CROPS FOR WEED SUPPRESSION IN ORGANIC CROPPING SYSTEMS. Abram Bicksler and John B. Masiunas, Graduate Research Assistant and Associate Professor, Univ. of Illinois, 1201 West Gregory Dr., Urbana, IL 61801.

Canada thistle [*Cirsium arvense* (L.) Scop.] is an increasing problem in organic cropping systems. Canada thistle causes extensive crop yield losses through competition and, perhaps, allelopathy. The prickly mature foliage reduces productivity by increasing harvest difficulty and deterring livestock from grazing. Cover crops may suppress Canada thistle in organic cropping systems. The suppressive ability of cover crops on Canada thistle relates to their capacity to occupy ecological niches otherwise available for weed development. This occurs through cover crops sequestrating soil nutrients, releasing allelochemicals, and modifying the soil microenvironment. Buckwheat (*Fagopyrum* spp.), is commonly used as a green manure by sustainable and organic farmers. Buckwheat quickly germinates, rapidly establishes a canopy, and shades out weeds. Buckwheat plants also contain the allelochemicals, fagomime, 4-piperidone, 2-piperidine methanol, gallic acid, and (+)-catechin. Sudangrass fits into a summer niche when Canada thistle growth is poor. Sudangrass is a C_4 species that is best able to use resources in a warm, high-light environment and produces tremendous amounts of biomass. Sudangrass rapidly closes canopy, reaching heights of 3 m and immobilizes nutrients, making it more competitive than Canada thistle. Sudangrass contains the allelochemicals sorgoleone and dhurrinase. Cowpea has shown promise as a weed-suppressive cover crop in the California desert. Our objective was to evaluate the summer annual cover crops, buckwheat, cowpea and sudangrass for their ability to suppress Canada thistle. The study was conducted in a certified organic field at the Cruse Tract Irrigated Vegetable Research Farm in Champaign and the Blue Moon Organic Farm in Urbana. The study was a randomized complete block design with three (Blue Moon) or four (Cruse Tract) replications. The treatments were 'Sweetleaf II' sudangrass (NC+ Organic), 'Papago' cowpea (Seeds of Change), and common buckwheat (Fizzle Flat Farm). At the Cruse Tract we also included 'Black Africa' sorghum (Seeds of Change). The sudangrass and cowpea were drilled June 7 at Champaign and June 21 at Urbana. Buckwheat does not tolerate the heat of summer, thus it was planted later, when night temperatures started to cool, on July 20 (Champaign) and August 11 (Urbana). The seeding rates were 50, 67, and 100 kg/ha for sudangrass (and sorghum), cowpea, and buckwheat, respectively. Cover crop and weed counts and biomass were determined at approximately two-week intervals. The biomass data was used to create growth curves for the cover crops. The cowpea did not suppress Canada thistle or annual weeds (primarily redroot pigweed and common purslane) and was susceptible to bean leaf beetle feeding. The sudangrass (and sorghum) produced plants up to 3.5 m tall and when combined with mowing was very suppressive of Canada thistle and annual weeds. Buckwheat was also very suppressive of Canada thistle and annual weeds even though its foliage did not reach more than 90 cm. Buckwheat was difficult to manage in organic farming systems because it remained green until the first hard freeze in November and produced hard seed. Data on Canada thistle regrowth will be collected in the spring. Sudangrass when combined with other practices appears to have promise for suppressing Canada thistle in organic cropping systems.

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