Intercropping: Wheat-Chicory (Pilot Year)

Project duration: May 2020 – September 2020
Objectives: To evaluate intercropping potential for wheat and chicory
Collaborators: PCDF

Background

Chicory is a short-lived, broadleaf perennial that has gained the attention of livestock producers for its high production potential, excellent nutritional qualities, and deep taproot. The crop may be seeded alone or as part of a chicory-grass or chicory-legume mixture. For a good summary of chicory cultivation see this agronomy factsheet, prepared by Penn State University. Figure 1 shows second-year chicory plants at PCDF. (Note that the taproot is broken off.)

The trial examines the potential for establishing chicory with a wheat crop. This would provide producers with the opportunity to benefit from a cash crop during the establishment year.

Figure 1: Year-2 chicory plants, showing 40” of top growth and strong taproot

Results

The data presented here are for the pilot year, which seeks to establish proof-of-concept. PCDF plans to continue the trial in 2021, with some modifications (detailed below). Treatment 5 differed from the check (wheat-only) (Table 1). However, the difference stems from variation in plot yield (bu/ac) for Treatment 5 (Rep 1 = 84.7, Rep 2 = 82.3, Rep 3 = 71.4). Stand establishment for Treatment 5, Rep 3 was poor, resulting in lower yield relative to the other plots for that treatment.

The results for the pilot year suggest that the lower seeding rates for chicory provide unsatisfactory results for establishing a chicory crop, based on the number of plants observed per plot. The trial will be redesigned for 2021 to use higher seeding rates (3 and 4 lb/ac) and additional intercrops (barley, oat and wheat), for 6 entries in total.

There are no registered herbicides for chicory, making intercropping more challenging. Good weed control prior to seeding is crucial. The trial was hand-weeded.

Table 1: Summary of statistical information for wheat yield

	Seeding rate				
Treatment	Wheat	Chicory	Wheat yield (bu/ac)	Statistical significance	
Treatment 1	90 lb/ac	-	83.4	A	-
Treatment 2	90 lb/ac	0.5 lb/ac	72.6	A	B
Treatment 3	90 lb/ac	1.0 lb/ac	75.2	A	B
Treatment 4	90 lb/ac	2.0 lb/ac	75.1	A	B
Treatment 5	90 lb/ac	3.0 lb/ac	79.5	-	B
CV (%)			7.5		
LSD (0.05)			9.05		

Yield for varieties not connected by the same letter are significantly different

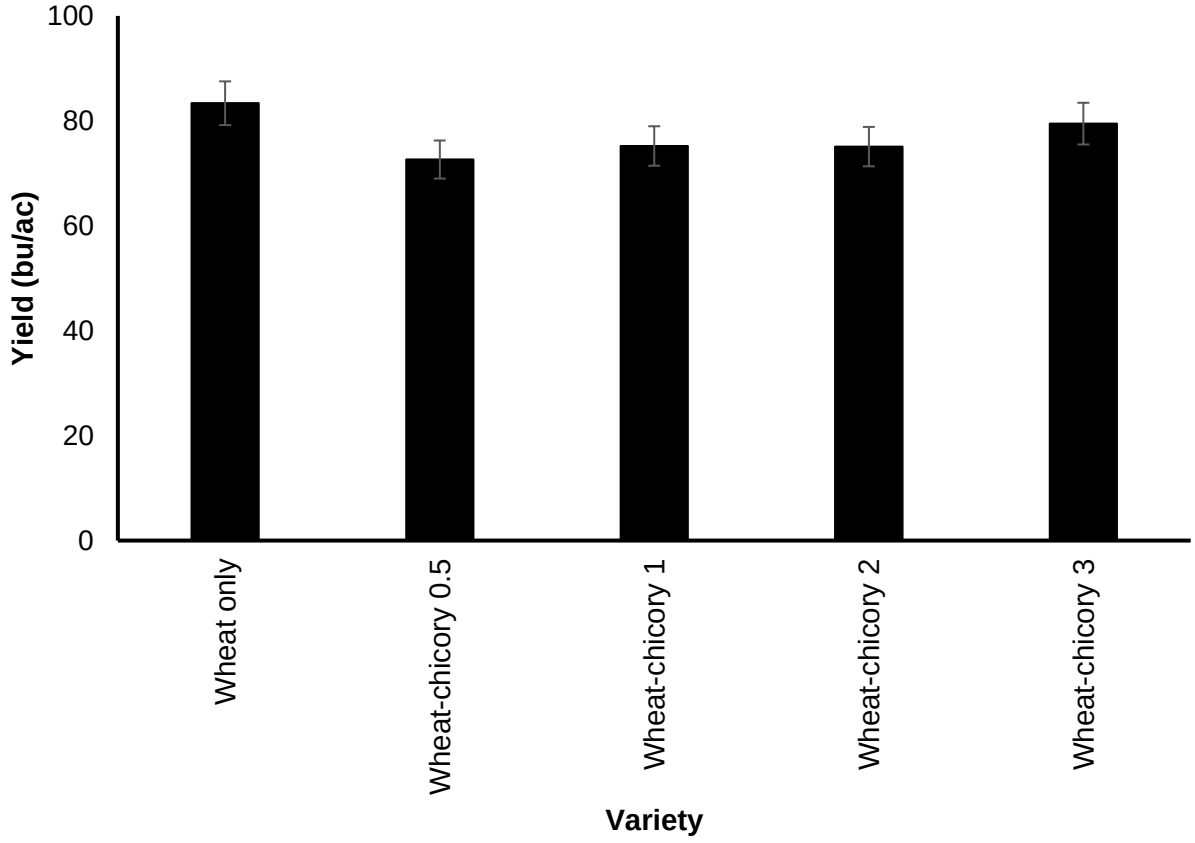

Figure 2: Wheat yield (bu/ac) by treatment.

Materials and methods

Experimental Design: Random Complete Block Design
Wheat variety: AC Goodeve VB
Entries: 5
Replications: 3
Seeding: May 22
Harvest: Sep 11

Data collected	Date Collected
Emergence:	Oat: May 24-25, Clover: May 27-30
Wheat Heading:	Jul 5-8
Stand rating:	Jul
Vigor Rating:	Jul
Yield:	Sep 11
Moisture:	Sep 11

Agronomic info

Previous year's crop:	Barley Silage
Soil Type:	Erickson Loam Clay
Landscape:	Rolling with trees to the east
Seedbed preparation:	Heavy harrowed

Table 3: Fertility Information

	Available	Added	Type
N	61 lb/ac	128 lb/ac	46-0-0
P	47 ppm	10 lb/ac	11-52-0-0
K	393ppm		

No herbicide applied (hand weeded)