

Integrated Crop - Livestock Systems - 2016 Summary

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Late summer and fall grazing (Phase 3)

Phase 3 of the Integrated Crop/Livestock systems project was initiated in 2015 focusing on providing forages at times when native range may not be of adequate quality to maintain the rate of animal weight gain. Previous phases looked at the late fall (Phase II) and winter periods (Phase I). In this phase, we continue to focus on the late fall grazing period, but also include potential needs during the late summer. In Phase 3, we are also looking to increase grain production while meeting critical forage needs, so harvestable grain crops are included for two years out of a three year rotation.

In order to improve the statistical integrity of the study the two 15 acre paddocks (i.e. the 2 replications) were split in half across existing strips. Treatments were re-randomized in the resulting "new" half (the opposing end from the main entry to each paddock) to yield 4 replications.

Cropping system – integrated treatments:

1. Spring wheat, which is inter-seeded at or around the 4-leaf stage with a 6-way mixture of intermediate wheatgrass, alfalfa, hairy vetch, red clover, daikon radish, and chicory.
2. Inter-seeded mix from previous spring wheat allowed to grow, then hayed during the growing season³.
3. Corn for grain inter-seeded with soybeans.

Check strips – grain-only treatments:

1. Spring wheat
2. Soybeans
3. Corn

Grazing treatments – 20 yearling steers in each group (5 per replication):

1. Graze cropping system grazing treatment strips beginning in the fall. Hay harvested from the strips fed to the steers on those strips.
2. Graze native and introduced pastures and feed hay as needed.

Spring wheat strips were sprayed May 2 with Cornerstone 5 Plus (24 oz/ac) + surfactant. Spring wheat (integrated treatment and check strips) was seeded with a JD 750 drill on May 4 & 5. All corn treatments and soybean check strips were sprayed with Durango (20 oz/ac) + 2, 4-D LV6 (10 oz/ac) + surfactant on May 17. An 11-row JD MaxEmerge II planter with 15 inch row spacing was used to plant the interseeded corn and soybean "integrated" treatment, with corn seed and soybean seed loaded in alternating planter boxes (6 rows of corn, 5 rows of soybeans). Both corn treatments were seeded May 27. The soybean check strips were planted June 2. Spring wheat was sprayed post-emergent on June 7 with Tacoma (10 oz/ac) + Moxxy 2E (16 oz/ac). Proso millet was interseeded in the cover crop strips on June 9 with a JD2 750 drill at a rate of 8 lb/ac on 30 inch centers. The spring wheat integrated treatment was inter-seeded on June 13 with the 6-species cover crop mix using a JD 750 drill by planting at a slight angle to the spring wheat rows and removing the residue handlers in front of the openers. All corn treatments and soybean check strips were sprayed June 15 with Durango (24 oz/ac) and surfactant. All spring wheat treatments were combined Aug 30. The soybean check strip was combined Oct 14. All corn treatments were combined Nov 4 & 5 without the straw chopper.

Summary

Both corn and wheat grain yields were lower on the integrated strips where cover crops had been interseeded. Two cuttings of hay were harvested from the plots that had been seeded to cover crops in 2015. Grazing was planned on the integrated plots using 5 yearling steers per replication. Grazing was completed on the plots that had been seeded to cover crops in 2015. However, grazing was interrupted by deep snow, and will be completed in the spring if possible.

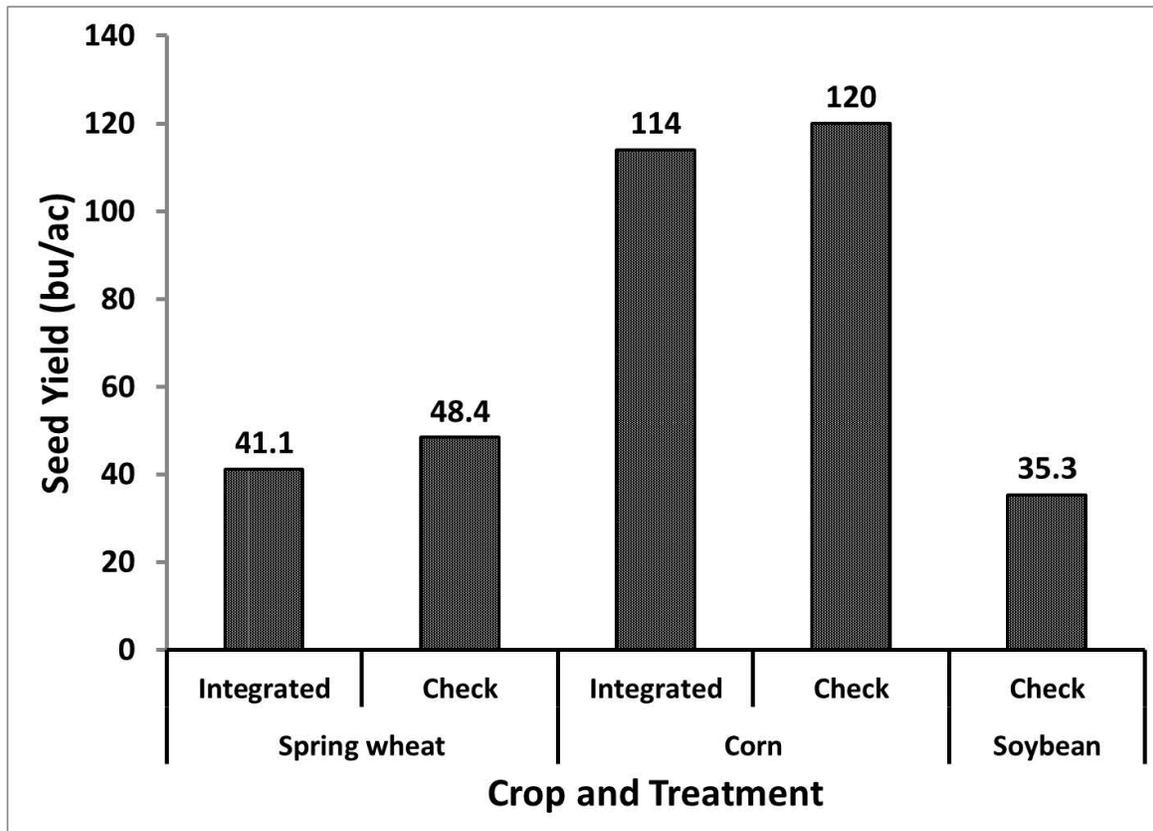


Figure 1. 2016 grain/seed production for the grazed (Integrated) and grain crop check (Check) strips.

Table 1. Crop parameters for 2016.

| Crop | Cultivar or type | Planting | Planting rate | Fertilizer | Harvest / Grazing |
|-------------------------|----------------------|------------|----------------|---|-------------------|
| Spring wheat | Glenn | 5/4 & 5/16 | 100 lb/ac | Urea - 30 lb N/ac MAP - 30 lb mat/ac | 8/30/16 |
| Cover crop mix: | | 6//16 | 36 lb/ac | None | |
| Intermediate wheatgrass | Manifest | | 9 lb/ac | | |
| Alfalfa | Vernal | | 14 lb/ac | | |
| Red clover | common | | 3.5 lb/ac | | |
| Hairy vetch | Haymaker | | 5 lb/ac | | |
| Radish | Daikon | | 3.5 lb/ac | | |
| Chicory | common | | 1 lb/ac | | |
| Corn | NuTech 5N-183 3000GT | 5/27/16 | 24,500 sds/ac | Urea 40 lb N/ac MAP - 30 lb mat/ac | 11/9/16 |
| Interseeded w/ Soybeans | Asgrow AG 0434 | 5/27/16 | 80,200 sds/ac | | |
| Check strips | | | | | |
| Spring wheat | Glenn | 5/4 & 5/16 | 90 lb/ac | Urea - 30 lb N/ac MAP - 30 lb mat/ac | 8/30/16 |
| Corn | NuTech 5N-183 3000GT | 5/27/16 | 24,500 sds/ac | Urea 40 lb N/ac MAP - 30 lb mat/ac | 11/8/16 |
| Soybeans | Asgrow AG 0434 | 6/2/16 | 170,000 sds/ac | None | 10/14/16 |