



Figure 1: Sheep in a black walnut silvopasture system "actively" taking advantage of shade.

Introduction:

Whole-farm approaches to gut parasite infection in small ruminants are essential as anthelmintic resistance is reducing the efficacy of pharmaceutical parasite control solutions. Dietary condensed tannins can lower parasite numbers and viability and some success in parasite control has already been achieved by feeding *Lespedeza cuneata*, a condensed tannin-producing forage. However, lespedeza has poor seedling vigor, and establishment in pastures is difficult and expensive. Woody shrubs and browse, on the other hand, often produce tannins and also are deep-rooted and competitive with forage grasses. In some hardwood silvopastures – in which trees, forages, and livestock are intentionally integrated – trees can be managed to provide tannin-rich fodder for grazing animals.

Objective:

Assess an alternative strategy for parasite control in small ruminant production systems through the framework of silvopasture.

Methods:

Study site and characteristics:

- Kentland Farm; Blacksburg, Virginia
- 12 weeks, May through August 2016
- 3 replications x 3 treatments rotationally stocked with Dorper lambs
 - **Black walnut silvopastures:** 4 ewes, 1 wether
 - **Honeylocust silvopastures:** 5 ewes, 2 wethers
 - **Treeless pastures:** 5 ewes, 2 wethers
- Lambs were weighed every four weeks
- Eye scans using the FAMACHA system were completed every two weeks and fecal egg counts were assessed every four weeks



Figure 3: Taking photos of stump growth before lambs were moved into the paddock.

A double sample approach was used to estimate the browse dry matter available to the lambs upon entry to a new paddock:

- **Photos** of each shrub were taken on a white background before sheep were moved into the fresh paddock
- A random shrub from each black walnut silvopasture and two shrubs from each honeylocust silvopasture were **harvested, dried, and weighed**
- **Green leaf area** was estimated using the color selection tool in Photoshop CS6
- The **relationship** between the green leaf area and the mass of each harvested sample was used to estimate the total dry matter available in each shrub

The harvested and dried samples will be assessed in the lab for percent protein and neutral detergent fiber, as well as condensed tannin content.



Figure 2: Sheep in a honeylocust silvopasture system grazing regrowth off a residual stump.

Results:



Figure 4: Lamb gains were high with little difference across treatments, though statistical tests for significant treatment differences will be completed at the conclusion of the study.

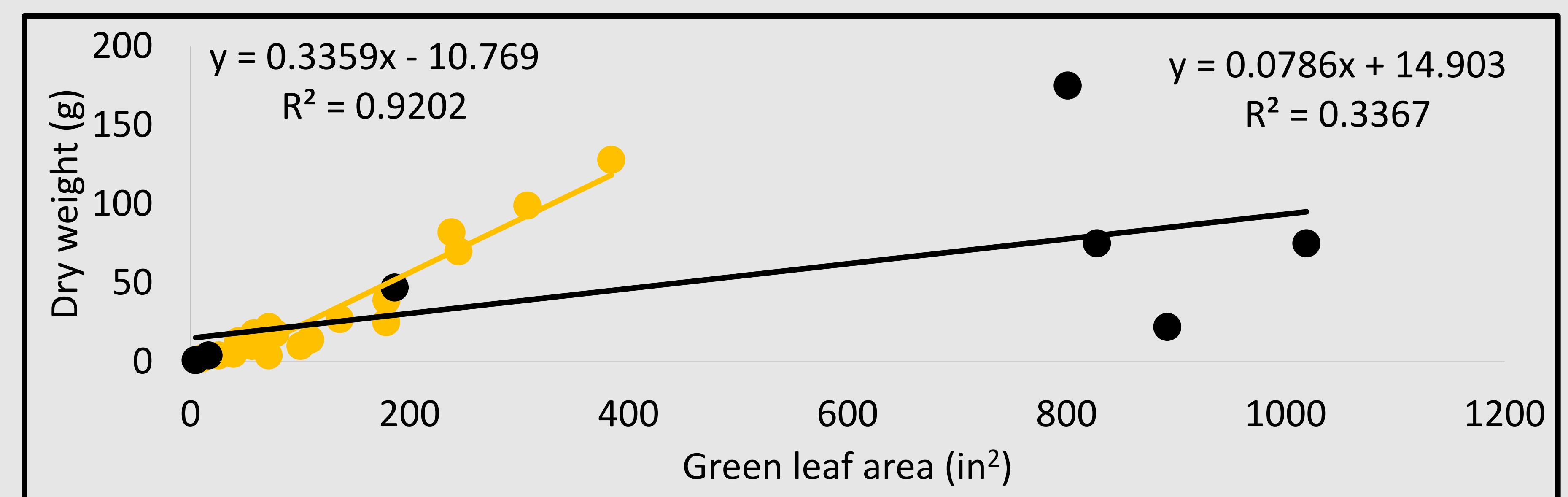


Figure 5: Regression of green leaf area against shrub dry matter in the black walnut (black dots) and honeylocust (yellow dots) silvopastures

Total stump dry matter available to lambs on entry to a fresh paddock on June 2 and 9, 2016 in the black walnut silvopasture was **145** and **65 g**, respectively; for lambs in the honeylocust silvopasture, total stump dry matter available was **1117** and **727 g**, respectively. All stump dry matter available was consumed readily by the lambs before they were moved to a new paddock.

Fecal samples have indicated little to no Strongylid egg shedding to date. FAMACHA eye scores have also been low, indicating little parasite infection and influence early in the study.

Conclusions:

The double sample photographic technique worked well for the estimation of dry matter produced by the honeylocust stumps, though the low number of available stumps in the black walnut silvopasture minimized the effectiveness of this technique in these systems. Though lambs readily consumed all available browse, the effect of the browse on the weight gain of the lambs and their parasite loads over time remains to be seen. Parasite loads for all lambs in this study have been low due to environmental factors and the natural resistance of hair sheep to gut parasites.



Figure 7: Weighing lambs.

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