Virginia Cattle Industry Board

Final Report

7/29/2021

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Title: Creep-Grazing Brassica and Small Grain Forages for Fall-Born Calves (21-3)
Project Type: ☐ Education ☐ Market Development ☐ Promotion ☒ Research ☐ Youth Development

Original Funding Amount: $6,816
Remaining Balance: $0

Objectives and Results:
Were the objectives from the original proposal reached? How? If not, why not? Please discuss any problems or delays. Methods and resulting data should be reported as they pertain to each objective.

Our objective of determining the benefit of creep-grazing winter annual forages for fall-born calves was reached in part. The planting for this project was slightly delayed due to funding delays. In addition, deer grazing pressure significantly impacted the growth and timing of the available forage in the creep-grazing paddocks, which delayed the time that we were able to provide creep-grazing access to the calves in the appropriate treatments. However, we were able to achieve some promising results despite these limitations.

Treatment system 4 was changed from native warm season grasses and forbs to winter annual forages only, i.e. the forage stand was sprayed with glyphosate (2 qt/ac + 0.5% surfactant) in October 2020. Each experimental unit (16 acres) was stocked with eight cows, and treatment systems 1, 3, and 4 were replicated three times while treatment system 2 was replicated twice. Creep forage (rye at 70 lb/ac and rape cv. 'Barsica' at 3 lb/ac) was established in the native grass and winter annual pastures between September 24 – October 5, 2020. Fertilizer (80-0-0) was spread on the native grass and winter annual pastures on October 1, 2020. Calves were provided access to creep forage in the native grass and winter annual pastures on April 8, 2021. Calves were weaned from dams on May 4, 2021 using a fenceline weaning method. Calves in the native warm season grass and winter annual treatments were provided access to their creep-graze paddocks in addition to another cool season grass paddock. Calves in the rotational stocking and continuous stocking treatments were given access to cool season grass paddocks. Calves were removed from paddocks 16 days later and re-weighed.

Available forage mass in the creep-grazing paddocks was insufficient for calves until April due to deer grazing pressure. Forage was sampled every other week while the calves were in the paddocks for an estimate of available biomass and nutritive value. A species composition assessment was made using the step-point method. There was no difference ($P=0.5574$) in available forage mass between the native warm season grass paddocks (1750 ± 210 lb/ac) and the winter annual paddocks (1550 ± 210 lb/ac), but forage mass increased over time ($P=0.0050$). There was no difference in the percent of the sward as rye (41 ± 11%; $P=0.5739$), native warm season grasses (2 ± 2%; $P=0.2254$), clover (7 ± 6%; $P=0.2153$), winter annual weeds (28 ± 14%; $P=0.2685$), or bare ground (5 ± 1%; $P=0.4226$). There was significantly more ($P=0.0438$) cool season perennial grasses as percent cover in the native grass pastures (29 ± 2%) than in the winter annual forage pastures (13 ± 2%). Forage crude protein tended ($P=0.0593$) to be slightly higher in the native grass pastures (17.5 ± 0.6%) than in the winter annual forage pastures (15.5 ± 0.6%) and

declined in both pastures over time. Forage total digestible nutrients was similar (P=0.4364) in both treatment pastures (65.9 ± 0.8%), but declined over time.

Calf weaning weights were adjusted to 205-day age adjusted weaning weights using the American Angus Association dam age adjustment factors. This includes weights when calves were weaned (AdjWW1) and when calves were removed from weaning paddocks (AdjWW2). The AdjWW1 of calves in the rotational stocking treatment (437 ± 14 lb) were significantly (P≤0.0134) less than the AdjWW1 of calves in the continuous stocking treatment (494 ± 11 lb), native grass treatment (512 lb ± 12 lb), and winter annual treatment (507 ± 11 lb). There was no significant difference in AdjWW1 of the calves in the latter three treatments. The AdjWW2 of calves in the rotational stocking treatment (442 ± 13 lb) were significantly (P≤0.0220) less than the AdjWW2 of calves in the continuous stocking treatment (491 ± 10 lb), native grass treatment (516 lb ± 11 lb), and winter annual treatment (513 ± 10 lb). There was no significant difference in AdjWW2 of the calves in the latter three treatments.

Without a full year's worth of hay feeding and production data, we are not able to finalize our economic analysis, but we can provide some preliminary figures. Using a partial budget analysis created from the costs incurred by implementing each treatment, we compared the relative profitability of the three treatments to the control treatment (rotational stocking). We used the VDACS 10-year average prices for steers and heifers by weight class to determine the change in gross returns to calf sales using AdjWW2. With an assumed value of hay of $110/ton, we assumed that the continuous stocking treatment would be fed hay for four more weeks, the native grass and winter creep treatment would be fed hay for two less weeks, and the winter and summer annuals treatment would be fed hay for four less weeks. The results of those data are shown in Table 1. The significant cost of establishing the summer annuals eliminated the benefit of the increased AdjWW2 of the calves, while providing creep forage in native grass pastures and the continuous stocking treatment were slightly more profitable per cow than the control treatment. These data should be considered as preliminary, due to the assumptions noted above and the limitations to our study due to late fall planting and wildlife damage.

Table 1: Relative profitability of creep-grazing treatments for fall-born calving systems using a partial budget analysis (all numbers reported as relative difference in dollars per cow-calf pair compared to rotational stocking treatment)

Treatment	*Continuous stocking*	*Native warm season and creep*	*Winter creep and summer annuals*
Variable costs for winter annual establishment	$0	$96.42	$96.42
Variable costs for summer annual establishment	$0	$0	$164.23
Net cost/benefit to change in hay feeding days	$0	$25.03	$50.05
Net change in calf sales	$82.26	$85.74	$80.93
Net annual profitability	$82.26	$14.34	-$129.68

Overall Benefit for Virginia Cattle Industry:
Please indicate the number of people that were impacted by or involved with this grant: How will your results improve Virginia's Cattle Industry?

While it is not feasible to measure adoption of the practices presented in this project, the results of this project which have been broadly shared have the capacity for improving the productivity of fall-calving herds by 116% relative to the rotational stocking treatment without creep-feeding practices. While the

profitability based on a preliminary estimate indicated that the winter and summer annual forages treatment was less profitable per cow than the control treatment, the native warm season grass with winter annual forages interseeded for creep-grazing for fall-born calves increased profitability by $14 per cow.

Activities Associated with Project:
List any activities held in association with this project, including date, type (article, brochure, training, event, etc.), purpose, and any pertinent results.

An article reporting the results of this project was published in the Virginia Forage and Grassland Council newsletter, *The Virginia Forager*, and a slightly modified article reporting the results of this project along with the preliminary partial budget analysis was published in the Virginia Cattlemen's Association newsletter. We anticipate highlighting the results of this project at the biennial Shenandoah Valley AREC field day.

Lessons Learned:
Comment on what worked, what did no work, and what you would do differently.

Creep-grazing for fall-born calves appears to have significant promise for increasing the productivity and even profitability of cow-calf production systems in Virginia. Even though we were only able to provide creep-forage to the calves for about 30 days prior to weaning, we still saw an improvement in AdjWW2 of around 73 lb compared to the rotational stocking treatment.

This coming season, we would like to establish the winter-annual forages earlier (August) and develop a three-dimensional electric fence to exclude deer from the paddocks.

Future Work:
Discuss continuation of the project or how results will direct future activity.

We have submitted a proposal for a second year of funding from the VCIB. We are hoping to continue this project for the next two years to determine the effect of yearly weather patterns on the project results. We might also may be able to distinguish differences between the continuous stocking treatment and creep-grazing treatments if we continue this project for multiple years.

Regions:
Please indicate what Virginia cattle production areas were impacted by this grant activity:
Select all that apply:

☒ District I – Western South West
Buchanan, Dickenson, Lee, Russell, Scott, Smyth, Tazewell, Washington, Wise

☒ District II – Eastern South West
Bland, Carroll, Floyd, Giles, Grayson, Henry, Montgomery, Patrick, Pulaski, Wythe

☒ District III – Southern Valley
Alleghany, Amherst, Augusta, Bath, Botetourt, Craig, Highland, Nelson, Roanoke, Rockbridge

☒ District IV – Northern Valley
Clarke, Frederick, Page, Rockingham, Shenandoah, Warren

☒ District V – Northern Piedmont
Accomack, Albemarle, Arlington, Caroline, Culpeper, Essex, Fairfax, Fauquier, Fluvanna, Gloucester, Goochland, Greene, King and Queen, King George, King William, Hanover, Henrico, Lancaster, Louisa,

Virginia Cattle Industry Board
Grant Reporting

Loudoun, Madison, Matthews, Middlesex, New Kent, North Hampton, Northumberland, Orange, Prince William, Rappahannock, Richmond, Stafford, Spotsylvania, Westmoreland

☒ District VI – Southern Piedmont
Amelia, Appomattox, Bedford, Brunswick, Buckingham, Campbell, Charlotte, Charles City, Chesapeake, Chesterfield, Cumberland, Dinwiddie, Franklin, Greensville, Hampton, Halifax, Isle of Wight, James City, Lunenburg, Mecklenburg, Newport News, Powhatan, Nottoway, Pittsylvania, Prince Edward, Prince George, Suffolk, Sussex, Southampton, Surry, Virginia Beach, York

Final Budget and Justification:

Item Type	Original Awarded Amount	Final Amount Spent
Personnel	$3120	$2193
Fringe	$250	$1177
Travel	[$0.00]	[$0.00]
Supplies & Materials	$1118	$2272
Contractual	$2328	$1175
Other	[$0.00]	[$0.00]
Total	$6816.00	$6816.00

[How does the original budget relate to the final? Discuss any differences. Please include source and amount of other supporting funds, facilities, and personnel, if applicable.]

The fringe rate for the employee that worked on this project was greater than what we originally anticipated with a wage hire. However, the amount spent on salary was less than expected so total personnel costs did not change

The research farm ended up doing more of the project activities in-house instead of contracting them out. As a result, our cost for materials was greater than expected, but it also resulted in corresponding reduced contractual costs.

Credits: Please list how the Virginia Cattle Industry Board was recognized as a sponsor of this grant project.

VCIB was recognized as the funding source for this project in both published articles.