

NORTHEAST REGION SUSTAINABLE AGRICULTURE
RESEARCH AND EDUCATION PROGRAM

FINAL REPORT: PROJECT NUMBER FNE93-25

Project Title: Demonstrate the effectiveness of fiber-producing goats as an alternative to chemical weed and brush control relative to pasture reclamation and management.

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Objective:

Demonstrate the effectiveness of fiber-producing goats in biological weed and brush control. Specifically, in this case, cashmere-producing goats were used to reclaim a 13 acre abandoned pasture thereby reducing and/or eliminating the use of herbicides as well as the labor necessary to complete this task. This demonstration project provided an excellent opportunity to characterize the types of weeds and brush controlled by goats as well as their role in agriculture, in the Northeast Region.

Background:

-Fiber-producing goats have been proven efficient biological weed and brush control agents in Australia and New Zealand with millions of dollars devoted to herbicides for pasture maintenance and reclamation saved annually.

-Additionally, goats co-graze compatibly with other livestock; consuming weeds and brush preferentially that other livestock do not eat. Subsequently, pastures are improved by reducing undesirable competitive growth without the expense of herbicides or labor necessary for maintenance.

-A number of biological weed and brush control projects are underway in the West, Midwest and South Central states with excellent preliminary results (see attached articles). A particularly valuable finding has occurred in the Midwest where fiber-producing goats have been used to control the highly invasive leafy spurge, a serious problem in pastures and other areas which no other livestock will graze.

-Additional projects are evaluating the use of these animals to control weeds and brush along waterways thus reducing chemical contamination of water sources. Control of competitive understory development is another application for goats.

-Finally, these hardy, low-maintenance goats will produce two valuable by-products: cashmere and meat while providing a service which decreases agricultural costs and is environmentally responsible. As a result of modest projects such as this, goats may be established as the "missing link" in agriculture as well as a valuable addition to the movement towards sustainable agriculture.

Methodology:

1. Perimeter (high tensile) fencing was installed encompassing the abandoned 13 acre pasture.

Due to the excessive undergrowth in this semi-wooded pasture the installation of the fencing was not completed until August, 1993.

No electric source was available to this area of the farm therefore a solar charger was used.

2. The pasture was subdivided into one acre plots for rotational grazing using polywire electric fencing.

3. Stocking rate was 12 mature cashmere goats based upon weight equivalents and the density of the pasture overgrowth.

4. Rotation to a new area occurred every 2 weeks once again because of the density of the pasture overgrowth.

5. Plant grids, 100 feet long with plant characterizations taken every 3 feet. Characterizations were conducted every two weeks. The Soil Conservation Service Representative provided the information for establishing the plant grids but was not involved with the characterizations.

6. Additional data was collected regarding the growth, body condition and fiber production of the goats used during the exclusive grazing periods (no hay, silage or grain concentrate supplementation) by the herd owner.

7. Due to the severity of this winter, no data could be collected regarding the ability of the goats to further reduce undesirable undergrowth particularly woody undergrowth during winter months when no fresh growth was available. Ground cover with snow occurred from 12-24-93 through 3-10-94.

Results:

1. Initial characterization of the weed and brush content of each of the rotational plots revealed the following:
 - extensive overgrowth with multiflora rose, all stages of growth including up to 6 in. circumference of established bushes.
 - extensive overgrowth with brambles of many varieties, particularly raspberries.
 - pokeberry
 - walnut, maple, birch and poplar trees, new growth
 - fine fescues, brood, duck and other grasses readily turning brown under dense overgrowth
 - golden rod, jewel weed, snakeroot, cudweed, wild geraniums as well as numerous other weeds represented in smaller quantities.

2. Every two week characterization of the grazed plots revealed the following:

- preferential browsing/grazing of all multiflora rose and brambles to 100% control. If the project would continue the multiflora/brambles would be completely held in check and die out as it did in many of the plots.
- as plots were opened up (eradication of multiflora and undergrowth) the fine fescues and other grasses suitable for other livestock to graze regained their normal growth patterns.
- goats were willing to eat the grasses also but would eat them to within only 6-8 inches of the ground towards the end of a grazing period and if no other preferential browse was available.
- pokeberry was not eaten (known to be poisonous plant). however it was readily trampled by the goats eliminating its regrowth.
- jewelweed was also not eaten but succumbed to the same fate as the pokeberry.
- golden rod was eaten to 100% control prior to the flowering stage. Limited consumption after flowering.
- there was minimal bark stripping, however if the density of the overgrowth would continue to be significantly reduced, bark stripping could be anticipated, therefore mature trees which are preferred by goats would need to be protected.
- in one plot there was significant white pine tree growth with minimal other undergrowth. The canopy was too dense in this area to allow for grass undergrowth. The pine growth was eaten preferentially to 50% control.
- birch trees were eaten preferentially to 100% control for new growth and any leaves which could be reached within browsing range of approximately 4-5 feet.
- walnut tree leaves were eaten, no barkstripping.

3. Weights of the project goats were recorded prior to beginning the project and every two months throughout the project. Body condition scoring according to established standards for goats and quantification and classification of fiber production during fleece growth/harvesting was also recorded.

Without supplementation of any kind, until 3rd week in November, the goats maintained stable weights to a +5 pound gain. Body condition scores improved from 2-3 on younger does. By the third week in November, weight began to decline slightly, therefore minimal hay supplementation was started once a day. 1/2 pound per head per day. By the third week in December, ground cover was complete requiring full supplementation with hay.

Fleece weights were increased by 10% on average. All does kidded by the end of March with a 220% kidding rate. All births were live and all kids were successfully weaned.

There were no incidences of illness of any kind. Fecal

samples indicated no parasite load.

4. Outreach Plan

- a. Publication of results to all Northeastern Regional agricultural institutions and extension services.
- b. Open Gate Farm Tours demonstrating the effectiveness of goats in weed and brush control as well as information about the management of goats on a temporary or permanent basis as a diversification enterprise in a sustainable agricultural approach.
- c. Share information with the Office for Small Scale Agriculture for assistance in publication of results and potential applications.
- d. Additional publicity through news articles in local newspapers for the region served by the Integrated Resource Management Program.
- e. Twilight Pasture Tours.
- f. Extensive publication of results in the newsletters of the Cashmere Produces of America, Eastern Cashmere Association and Ranch Magazine.

Evaluation of Outreach Plan:

Outreach Plans f and c are underway. One article is enclosed for your review. Other articles are pending. The approval and commencement of the project were advertised extensively.

Outreach Plans a,b,d and e were to be the responsibility of the Soil Conservation Service. It is most unfortunate that they did not maintain an intense involvement in this project from its outset. They were also to have conducted the plant grids. Instead, they taught the project leader how to conduct them and provided few references on plant identification although in all fairness, they did say that they were willing to look at any plant brought in which the project leader was unable to identify. This became impractical to conduct on an ongoing basis. The project leader invested in a number of weed identification guides and successfully completed the grids.

The Lehigh County Conservation District was to have conducted the photography of the pasture in a variety of stages, but they failed to do so.

Conclusions

Fiber-producing goats were able to provide 100% control of multiflora rose and brambles in a rotational grazing/browsing arrangement. In fact, these were controlled in the early Spring before institution of rotational grazing.

Fiber-producing goats were able to clear significant undergrowth in an abandoned pasture allowing desirable forages to recover and regrow. Other livestock could then

be placed in this pasture to cograze quite successfully.

If anyone embarks upon pasture reclamation/maintenance using goats, the fencing requirements need to be carefully noted. The high-tensile fencing is quite desirable if the joules are adequate. Goats do require 10-20 joules for completely successful restraint. The initial solar charger used in this project was found to be inadequate within 3 months of starting the project particularly when the goats were moved into a rotational plot which provided less of the desirable forages. This necessitated acquiring electric access to the pasture and the installation of an electric charger which provided the desired joule rating. No further problems were then encountered. Actually, any electric fence would be sufficient if the joule rating on the charger is adequate.

The project leader is hesitant to cite prejudice against goats as the primary reason for the lack of participation by the Lehigh County Conservation District. But this is often a factor in working in more traditional livestock regions. Further, perhaps the role of the Conservation District could have been more clearly defined as a contractual relationship.

The project leader feels strongly and the above data supports that there is a role for goats in diversified, sustainable agricultural operations of the future. Thank you very much for the opportunity to have participated in this exciting program.

Cashmere goats take on weed-control project

By Ellen Reker
Of Golden Fleece Kashmirs

NEW TRIPOLI, Pa. -- The Northeast Region Sustainable Agriculture Research and Education Program is funding a project to show how well cashmere goats control weeds.

The project is helping characterize the types of weeds and brush cashmere goats will control in this area of the United States. The project will involve the reclamation of an abandoned pasture in rural Pennsylvania.

As the project begins, the pasture is overrun with multiflora rose, numerous types of brambles and varied under growth. Linear plant grids are being used to determine which weeds and plants are controlled or ignored by the goats and which desirable pasture grasses recover. An

intensive rotational grazing technique is being used.

Preliminary results already suggest 100 percent control of multiflora rose and brambles because the goats persistently eat the leaves and eventually consume the plant stalks.

Most competitive brush and under growth is also being consumed.

The plants with a high water content, such as jewel weed, seem to be last on the goats' list for preferred food.

The initial impression the fiber-bearing goats have made on pasture specialist and soil conservationists in the Northeast has been quite good.

Sam High of the Soil Conservation Service and Dave Dunbar of the Lehigh County Extension Office both commented that these animals are "worth their weight in



Cashmere goat

(File photo)

gold" if they control multiflora rose invasion.

Goats are known to be particularly suited to preferentially browse any pasture or wood margin area especially during periods when fresh growing grass is not abundantly available. They will browse at eye-level or higher, choosing plants, brambles and brush that other livestock will not consume.

So far, probably because of the extensive weed and

became available in previously browsed areas.

With this fact in mind, the project will probably move into a second phase where the goats will graze along side of cattle or sheep to see if the animals are compatible grazers or if they compete with each other.

The Northeast Region Sustainable Agriculture Research and Education Program funded this project through the innovative Farm-

nize that individuals at the farmer/grower level often have practical and valuable ideas that could be shared with others in similar agricultural situations.

This project's funding was devoted entirely to perimeter fencing, which was desperately needed in this abandoned pasture. Characterization of the pasture reclamation will be done on a voluntary basis. As the project leader, I will be working in conjunction with the local Soil Conservation Service representatives and pasture specialists. The Soil Conservation Service is providing matching funds for the divisional paddock fencing.

This project and a number of biological weed and brush control projects involving goats underway in the West, Midwest and south central states may assist in defining the role of goats in a sustainable agricultural approach. This role will increasingly be viewed as a compatible, economical and environmentally sound one and allow these hardy, low-