

# Forage Facts



## Case Study on Spray Fields

Case 1. Problem Statement: Poor stands of bermudagrass and the presence of significant number of "weeds" on a waste receiving site.

- 1) Observations made by consultants when farm visit was made in October of second growing season.
  - a) Field was cleared of timber and planted to bermudagrass two years earlier. It had been receiving waste from a farrowing operation for two years.
  - b) The soil test report showed that the soil was low in phosphorous and potassium and marginal in Sulfur during the first season.
  - c) The bermuda stand was satisfactory in 90% of the field, but almost no bermuda was found in low lying depressions that remain wetter than the rest of the field. These depressions had bermuda plants scattered every 5 to 10 feet.
  - d) Most of the living weeds were crabgrass; there was a lot of residue not picked up by the last harvest (looked like fall Panicum). Common bermudagrass was scattered throughout the field.
  - e) This site was receiving nutrients from a sow operation where the N composition of the effluent and the hydraulic loading restrictions allowed 15 to 20 lbs of N every 3-4 weeks. No other nutrients were being applied.
  - f) Farmer said the winter rye had been harvested in late May or early June, but he did not remember exactly. The bales on the field edge contained cereal rye that had mature seeds in it.
  - g) The field had been harvested the second time in September.
  - h) The growth that was present in October was spotty, uneven height, with minimal soil cover.
  - i) The haying operation in September had not provided a uniform clean harvest because of apparent crop lodging.
  
- 2) **What do you really need to know before drawing conclusions about this problem? What questions should be asked or what records need to be reviewed?**
  - a) Current soil test report for the field and a sample from the areas with poorest stands.
  - b) Actual nutrients applied in the past two seasons.
  - c) Actual harvest dates.
  - d) Stage of growth of the winter crop at first spring harvest.
  - e) Estimate of forage mass or crop height at harvest time.
  - f) Percent of the time the depressions have standing water.
  
- 3) **What was suggested on day of the farm visit to supply further evidence of the problem?**

- a) Take new soil samples from the depressions as well as from areas where the bermuda was satisfactory.
  - b) Double check nutrient composition of the effluent.
  - c) Double check effluent application rates and timing.
  - d) Sample the hay for nutrient composition
  - e) Weigh about 10% of the bales to estimate crop yields
  - f) Sample bales for nutrient removal.
  - g) Sample live growing plants for nutrient composition.
- 4) **What was included in the report to the farmer after reviewing the soil test report and considering observations made from the site visit?**
- a) **Soil fertility**...see Table 1 for soil test results from areas with good and poor stands of bermuda.
    - i) Soil pH was in the 5.8 to 6.1 range, which could be slightly improved with lime, but such levels would not normally cause loss of stands.
    - ii) PI and KI we all satisfactory for crop growth.
    - iii) Cooper, Sulfur and Manganese levels were borderline low and it was suggested that consideration be given to applying. However, the areas with satisfactory plant growth had the lowest index levels, indicating that this was most likely not the problem.
    - iv) The level of N being applied from the effluent was not sufficient to grow high yields of bermuda nor grassy weeds. Therefore, consider increasing effluent N on the site (within hydraulic loading capacity). If land area cannot be changed, then other sources of N should be applied to grow a satisfactory crop
  - b) **Soil type- crop comparability**
    - i) Most of the field had satisfactory stand of bermuda, however, the depressions contained the most weeds and almost no bermuda. It appears that poor drainage is contributing to the loss of bermuda.
  - c) **General Crop Management**
    - i) To favor the target crop, minimize the spring competition from winter crop by harvesting in late March to very early April; it may be necessary to harvest winter cover again early to mid May. Cereal rye may regrow after the early 1<sup>st</sup>, but the regrowth will be tall and non leafy stems that will not shade the undergrowth of bermuda as much as the first growth.
    - ii) If the winter crop is ryegrass or prairiegrass, the regrowth following an early April harvest will be more competitive than cereal rye, so these two crops may require one to two more in May and June to minimize the shading effect.
    - iii) Generally, bermudagrass overseeded with any crop will need to be harvested three to four times per season. More timely harvests will improve the feeding value of the forage provide better weed control. In the problem areas like the depressions on this site, there may be an advantage to mowing them once or twice more than the rest of the field; this will help reduce the shading effect of the thick stand of crabgrass/Panicum. However, the crabgrass and panicums are likely

to yield more and take up more N than would bermuda (bermuda is not well adapted to the wet depressions). The odds are excellent that the depressions will always have a mixture of plants during the summer and very little winter annuals during the winter.

- iv) The depressions make up less than 10% of the field, and as long as vigorous crabgrass and fall Panicum continue to produce high yields of mass, the total nutrient removal from the field will be similar to an all bermuda crop.

**5) Summary for Case 1**

- a) Strongly consider harvesting winter cover crops in March before they reach late boot stage.
- b) Modify cropping plan to remove winter overseeding, especially where bermuda is thin.
  - i) Manage soil depressions for summer annual grasses rather than bermuda.
- c) Consider applying additional N to adequately meet the needs of the crop.

Table 1. Soil test results from areas within the field with satisfactory and unsatisfactory stands of bermuda. Samples were taken from two different locations in the field.

Stand condition	Index as reported by NCDA Soil Testing Lab					
	pH	PI	KI	Mn I	Cu I	S I
Satisfactory-1	6.1	89	95	14	13	15
Poor-1 Depression	5.9	84	124	25	22	23
Satisfactory-2	6.0	62	100	15	9	32
Poor-2 Depression	5.8	65	66	32	16	21

**Case 2a. Problem Statement: Poor stands of bermudagrass and the presence of significant number of "weeds" on a waste receiving site.**

- 1) Observations made by consultants when visiting the farm in August.
  - a) Virtually no bermuda grass was on the site.
  - b) Naturalized crabgrass, goosegrass, Panicum, vaseygrass found all over the field.
  - c) Farmer wanted to plant soybeans on the site in August to “provide a crop” for nutrient removal!!!
  - d) Standing water was on the site because there had been a heavy rain earlier that day. Indications are the soil is poorly drained and significant ponding was evident. The soil type seemed to be finer texture than mapped.
  - e) Hay had been harvested a few days earlier and it was evident that the growth was more than 20 inches tall at time of harvest. (see photos below)
  - f) Hay bales harvested in spring were stored around the field and it was evident that the winter cover had been cut after the plants were very mature (rye seeds found in the hay). See photo.
- 2) Why the site did not contain bermudagrass?
  - a) Soil drainage is too slow for bermudagrass to survive.

- b) Winter overseeding crop was routinely harvested too late in spring.
- c) Subsequent harvests are too mature and the competing weedy species dominate the bermuda.

3) Recommendations:

- a) Convert the stand to tall fescue which is more adapted to the site.
  - i) Planting could be made in fall following farm visit.
  - ii) This will require revision of waste plan and a change in the acreage needed to support current hog populations.
  - iii) Farmer does have additional land that could be used.
  - iv) Farmer is currently grazing some of his sites, but could convert to haying to reduce acreage needed.
    - (1) If he continues to graze he should consider non-toxic endophyte fescue
    - (2) If he changes to a hay system, he could use the non-toxic endophyte fescue or he could use toxic fescue varieties to enhance persistence of stands.
- b) The soybean option was not good because the remaining season was too short and the existing vegetation of summer annual grasses would potentially take up more nutrients during the remaining of the season.

**Case 2b. Problem Statement: On the same farm as Case 2a there was a 2<sup>nd</sup> field with poor stands of bermudagrass.**

- 1) Observations made by consultants.
  - a) Bermuda ground cover was thin and there were streaks through the field which appeared as if heavy windrows had been left in place for several days causing death of the plants beneath.
  - b) This field had about a 50% cover, but it was certainly very "patchy".
  - c) The soil appeared to be well drained and suitable for bermuda production.
- 2) Why the site was unsatisfactory:
  - a) Hay harvest management was too infrequent (2 harvest for the year), including the spring harvest of overseeded crop.
  - b) Large windrows left in place for several days.
- 3) Recommendations:
  - a) The thin areas could be replanted to a seeded type of bermudagrass, even at this late date; the odds are slim of getting an excellent stand, but it would be worth a gamble since soil cover was minimal.
    - i) If he chose to reseed with bermuda, then winter overseeding should not be allowed on this site this fall.
    - ii) If late summer seeding does not result in good stands of bermuda, then replant the next spring.
  - b) Another option is to treat the field as a crabgrass-bermuda field and modify the waste application plan by adjusting the RYE for the acreage.
    - i) Crabgrass has an RYE of 75% of bermuda
    - ii) Seeded bermuda has a RYE at 100% of hybrid bermuda.

Bales of rye in full head stage ..harvested in May.



Rye and summer annual grasses were allowed to mature before harvesting thereby shading the bermuda so much that it did not survive.

Note height of uncut vegetation near riser one week after harvesting field.



Panicums, vaseygrass, foxtails in bermuda spray field.



Note summer annuals...no bermuda

## Forage Fact (Feb. 2006)

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