
No-till

in the dairy industry

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Dave Goodenough
ARC-Livestock Business Division, Animal and Forage Production
Part 2

Ten years of no-till on Denleigh Farm

This presentation by René Stubbs, who farms in the Karkloof area a few kilometers outside Howick in the KZN Midlands, highlighted the advantages of the system of no-till farming, its profitability and sustainability.

Purchased by René in 1986, Denleigh, with a mean annual rainfall of 1160 mm, mostly in summer, previously had continuous maize production using conventional tillage methods, in conjunction with an extensive beef operation. There were no dairy cows on the farm and no pastures. Shortcomings of such a farming operation included severe erosion and related contour problems, a build-up of soil pathogens such as wireworms, rootworms, cutworms and diplodia and the soaring costs to replace

equipment used in the maize production operation.

Denleigh is now a dairy farm with no-till pastures and no-till maize being produced for silage with a cover crop following, as well as no-till maize and soybeans in rotation for grain. The incentives for these changes implemented by René were that previously maize yields generally remained constant, despite the best efforts, contours did not require frequent repairs and reconstruction, recent no-till knowledge emanating from the USA, Brazil etc, the enthusiasm of local advisors, coupled with a reduction in glyphosphate costs used as a systemic herbicide prior to drilling in the required pasture grass, maize, etc, and recent improvements in no-till equipment.

Using no-till methods, René has seen a general and steady increase in silage yields over the past ten years, peaking at 14 t/ha and in grain yields peaking at 10 t/ha. The no-till

methods have proved beneficial in other areas too, for example, it is estimated that a fuel saving of 30 to 40 litres/ha is possible with a saving of 300 tractor hours per year, as well as it not being necessary to replace equipment as frequently as when using conventional tillage methods.

The impact on the soil nutrient status and structure has also been substantial with soil acid saturations now approaching 0% thanks to periodic lime topdressings, with soil calcium, magnesium and organic carbons levels rising steadily over the years. There has also been a considerable increase in the earthworm populations with approximately 300 counted per square meter in a land no-tilled for the previous three years.

A change in the weed species has also been noted, with reduced populations of grass weeds, especially stoloniferous grass species, as well as a sharp decrease in soil pathogens. There is no longer a need to treat for wireworm, rootworm and black maize beetle.

The quality of the water in the nearby Karkloof River has also improved significantly as well as there being more food and cover for birds and buck in winter, resulting in an increase in their numbers.

René concluded his presentation by emphasising that the no-till system that he has adopted is effective, environmentally acceptable and economically sustainable. However, it requires a thorough understanding and long-term commitment and the passion to see it through. The system works!

Sowing ryegrass into kikuyu pastures

Nigel Smith and Beesie Stone spoke about their experiences and successes in sowing ryegrass directly into kikuyu.

Nigel, who farms near Creighton in KwaZulu-Natal in an area which experiences regular frosts in winter, said that he was forced into using this practice because of a shortage of irrigable land on his dairy farm. Initially he used annual Italian and Westerwolds ryegrass (*Lolium multiflorum*) varieties but is now drilling perennial ryegrass (*L. perenne*) varieties into his kikuyu pastures. The perennial ryegrass usually persists into the second year.

The key is to graze the kikuyu pastures regularly in the summer months and to not allow it to develop a “mat”. Those kikuyu pastures earmarked for the introduction of perennial ryegrass seed in autumn are mulched in January after a light grazing, using a heavy flail mulcher. The kikuyu is then allowed to grow out before being again grazed and mulched in March.

Nigel emphasised that in the Creighton area there is probably a 3-week “window period” commencing about 15 March when perennial ryegrass seed can successfully be drilled into kikuyu; drilled into the soil that is, and not incorporated into the mulch and rolled, as is sometimes the practice in other areas. Various seed drills can be used to drill ryegrass seed into kikuyu pastures, some however may require modification

with, for example, the incorporation of a press wheel to ensure the soil over the seed is well-compacted.

The sowing rate may vary from 12 to 20 kg/ha, depending on the amount of persisting perennial ryegrass plants from the previous year.

Nigel recommends irrigation immediately after sowing and two weeks later a quick, light grazing to remove any late autumn kikuyu growth, thereby minimizing competition for the emerging perennial ryegrass seedlings. Delay the second grazing until the perennial ryegrass plants are well-rooted.

Irrigation must be applied throughout the year; every week during the dry late autumn and winter periods and, when required, in the months following to supplement the normal summer rainfall; although Nigel feels that the frequency of irrigation applications can be reduced because of the high organic matter content in the soil. Frequent fertilizer topdressings should be applied as is normally the case with an irrigated high producing ryegrass / kikuyu mixed pasture.

The kikuyu in such mixed pastures also contributes to less compaction problems by the dairy cows.

The benefits of this no-till system, says Nigel, is that the soil carbon levels are up from 1.5 to between 6 and 7 %, earthworm activity has increased, there has been an increase in the overall total DM production in these mixed kikuyu/perennial ryegrass pastures of up to 29 t DM/ha/annum and the land

is utilized 365 days of the year. There is now no longer any need for big tractors, ploughs, rippers etc associated with the conventional preparation of land prior to planting.

Beesie Stone who farms in the Ixopo district in a relatively milder area with very few frosts and warmer summer months, (compared with Nigel Smith's Creighton farm), says that on his farm his kikuyu continues to grow in autumn for four to six weeks longer than is the case on Nigel's farm. Following a final grazing of his kikuyu pastures in early April, Beesie commences drilling his ryegrass seed into the kikuyu pastures after 10 April, using a local planter adapted with a press wheel, and he then mulches and rolls after drilling in the seed, followed by irrigation, which continues on a regular (weekly) cycle, as and when required depending on rainfall, and the normal recommended regular topdressings of fertilizer.

Beesie says he prefers to use the annual tetraploid large-seeded Westerwolds ryegrass varieties for drilling into kikuyu, with the first grazing five weeks after drilling in the seed. Dry matter production off such irrigated kikuyu / ryegrass pastures varies from 21 to 27 t DM/ha/annum. He sprays with a suitable insecticide to control cutworm and slug infestations.

Beesie also always establishes a land to fodder (Japanese) radish as a backup supply of forage for his dairy cows.

