

Is Kura Clover Worth the Wait?

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Last month I had the opportunity to work with Professors Ken Albrecht and Dave Combs of UW-Madison to put on a Pasture Field Day highlighting their kura clover research at the Arlington Research Station.

I have to admit that I was skeptical about the practicality for farmers of this highly touted and expensive new clover. A legume that persists in a pasture, that doesn't have to be reseeded – EVER – is an appealing prospect. But I've talked to quite a few graziers who have spent good money (around \$5 per pound currently) on kura clover seed and yet have little to show for it. What is the trick to making this work?

Kura clover is a *Trifolium (T. ambiguum)* originally imported from the Caucasus region of eastern Europe around 1900. It has been under investigation in this country for a couple of decades. It is unique among the clovers in that it spreads by underground stems or rhizomes. Ladino and other white clovers have above ground stems or stolons, which allow them to spread, but makes them vulnerable to drought. Red clover does not spread vegetatively, although it does readily seed itself.

Kura's rhizomatous nature, along with good disease resistance makes it extremely persistent. Once it's established, it seems to last forever. Plots here in Wisconsin are still going strong after more than 10 years, and Minnesota researchers have fields in existence for over 20 years, all without reseeding.

The kura-grass mixed pastures at Arlington ARE impressive. They are thick and lush with relatively high, stable proportions of kura clover. The researchers have seeded kura clover with grasses of several different statures: Kentucky bluegrass, tall fescue, and reed canarygrass. The clover stands vary with the vigor and structure of the grass species, from 75% with the Kentucky bluegrass to 37% with the reed canarygrass.

While most of us struggle to reach 30 to 40% red and ladino clover in a pasture, these guys are worried about too much clover. In fact, Ken and Dave are looking at nitrogen fertilization as a means of increasing grass competitiveness.

And cattle performance has been impressive on these kura clover pastures. Holstein steers at the Lancaster Station gained 2.66 pounds per day on kura/grass pastures compared to 2.27 pounds per day on red clover/grass pastures. At Arlington, dairy cows grazing kura/grass pastures averaged 60 to 64 pounds of milk per day, although they were supplemented at a relatively high level.

So, if we can get it established, kura clover might be the best thing for pastures since sliced bread. Might be--if we can get it going. Like most long-lived perennials, including reed canarygrass and prairie grass species, kura clover is painfully slow to establish. It can take 3 years or more to establish its extensive system of roots and rhizomes and you may lose it if you don't manage properly during those first years.

Here in Columbia County, we've used part of our Grazing Lands Conservation Initiative (GLCI) grant, plus donations of seed from Olds and Geertson Seed Companies to investigate kura clover establishment. We tried a range of options in a series of on-farm trials, but unfortunately, what we've learned from our experience is mostly what doesn't work.

Like most graziers, Dick Ryan is reluctant to tear up good pasture to establish a new species. On Dick's farm, we looked at three different seeding methods for establishing kura clover into an existing orchardgrass pasture. We counted seedlings that first year and determined that frost seeding and no-till drilling resulted in better germination and establishment of seedlings than using a single disk drill. However, by the end of that first season, we found only about 1 plant per square meter in any of the treatments. Now, in the third year, you can hardly find a kura clover plant in the whole paddock.

Bob Breneman took a more aggressive approach. He sprayed out an orchardgrass-red clover pasture with glyphosate in fall. The next spring, he seeded in kura clover and reed canarygrass, thinking that two slow growing species might be more compatible. We had a similar number of seedlings per square meter (10 to 12) early in the first year as we did in Dick's best plots. And, unlike in Dick's field, after a decline in the second year, we're seeing the proportion of kura clover in Bob's field increase. At a couple of plants per square meter this year, we may eventually have a good stand. Fortunately, there's been a lot of regrowth of orchardgrass and red clover and Bob has been able to continue to harvest forage off this paddock while the kura and reed canarygrass is establishing. I've talked to others who've used this method with some success as well.

Although not part of our project, Dick Cates has been working on establishment of kura clover by suppressing the existing pasture with herbicide, rather than killing it altogether. He used paraquat to damage the sod and slow grass growth. He has seen some establishment, but feels that the grasses have never quite recovered from the paraquat application. Overall, the pasture remains less productive than it was originally, but production should eventually fully recover as the kura gains a good foothold.

The most sure-fire way to establish kura clover is by starting with a clean tilled field, which is what we did at our third site, the John Wentz farm. The field had been in corn and John seeded the plots into a killed winter wheat cover crop. We're looking at kura clover seeded with two varieties of orchardgrass (Orion and Potomac), two varieties of festulolium (Kemal and Spring Green), and an improved variety of Kentucky bluegrass (Geronimo). We also compared two varieties of kura clover (Endura and Cossack) and have seen little difference in establishment and vigor aside from some red clover contamination in one of the lots of seed.

Although this was, by far, our best site, we're seeing only 12 to 15% kura clover in the best of our plots after 3 years. I'm expecting this proportion to increase over the next few years, and someday we may have to worry about too much clover in this pasture. But the real question is: what conditions need to be present to get establishment of kura clover in a reasonable amount of time, at a reasonable cost?

Ken Albrecht, who has been wildly successful (at least compared to the rest of us) in establishing kura clover, says that the key is controlling competition. Providing the clover seedlings access to light and plenty of nutrients and moisture is critical. There is little top growth in the first season while the plants put all their energy into growth of roots and rhizomes. With so little leaf area, the kura plants need to have competing grasses and broadleaf weeds kept under control consistently until they are well established.

Ken recommends aggressively mowing or grazing kura clover pastures even during the first year, once the clover has germinated. I'd go with mowing. The research we've done on pasture establishment suggests that mowing is a lot less damaging to new seedlings than grazing. Hoof damage and the pulling-tearing action of a cow's mouth are harder on the plants than the relatively clean cut of a mower blade.

So, we can't really treat kura clover like one of our traditional clovers. Kura seed for frost seeding is a risky investment that I wouldn't recommend to anyone. But, if you are seeding down new pastures or if you're ok with killing out a pasture to establish something new, you may want to consider it.

If you're patient and willing to accept less-than-perfect results, there is a practical, inexpensive, less risky way that we can introduce this useful plant into our pasture systems. Several graziers I know simply broadcast kura

clover seed over bare areas where animals have been fed or watered. Bob Breneman has done this all over his farm with both kura and reed canarygrass.

Bert Paris, in Dane County has tried this in a more systematic way. Bert outwinters his herd in a sacrifice paddock where he spaces 80 round bales evenly throughout the paddock. Break wires restrict access to a few bales at a time. In spring, he ends up with a series of bare spots where the bales were consumed, well-fertilized, and even mulched with a thin layer of trampled hay. A perfect seedbed. Bert tried drilling kura clover seed into one of these sacrifice paddocks in spring of last year. A year and a half later, he has mixed results: no establishment in the areas between the hay bales, and 80 bare spots with 0% to 40% kura clover. He figures that over time, the kura will spread, but right now, he has about 5% kura clover in his stand and he is undecided whether this method is practical or cost effective.

Legumes contribute significantly to forage quality, tonnage, and palatability especially during the hot, dry months. Looking at the research station paddocks, I can see how kura clover could be a real boon to graziers in the Upper Midwest. But it's hard to recommend it until we figure out how to establish it successfully on-farm. Ken has proven that it can establish well and is probably worth the money if you're successful. Controlling competition is key. That and a good dose of patience (and maybe a little luck) might just reward the pasture manager with a lifetime worth of performance.