

There are new forage crops on horizon

PEORIA, ILL. — Doubtful oil reserves and supplies, rising fuel costs, pressures to reduce the farm cost-price squeeze and, most importantly, an urgent need to preserve this Nation's resource heritage, soil and water.

These are real forces causing U.S. farmers, ranchers, and agricultural scientists to re-evaluate forage crops — grasses and legumes — and the agronomic practices that affect them. When managed properly, forage pasture and range plants do more to preserve soil and water and maintain soil productivity than any other crops, says Gerald E. Carlson, program leader for forage and range research, USDA's Agricultural Research Service.

Producers and researchers know that dairy cattle and meat animals can convert forages to food products from land that is often highly erodible and not suitable to many cultivated food and feed crops, he continues. This conversion not only produces food, otherwise unavailable, but also reduces loss of soil through erosion that now averages five tons or more an acre annually on much U.S. cropland.

They realize that production of forages, particularly legume forages and range grasses, may require less fuel and fertilizer, two costly ingredients of production, than other U.S. crops, Carlson says. They know also that bacteria on the roots of legume forages convert nitrogen from the soil atmosphere to a form the legume plants can use, and that some of

the nitrogen is carried over in the soil for ensuing crops in a planned rotation.

For these reasons, ARS scientists are improving forage pasture and range species through research, often in cooperation with State agricultural experiment stations. This is done largely through plant breeding and selection and such other practices as improving cropping systems, tillage and seeding methods, and nitrogen fixation. Here are a few representative examples from studies on major forage pasture and range crops during the 1970's and 1980's, in various parts of the Nation.

A team of federal and state scientists at St. Paul, Minn. is redesigning alfalfa in basic research for use as an annual to enhance its value in crop rotations, potentially one of this nation's best tools for maintaining soil productivity. Alfalfa was chosen, the scientists say, because it is the most widely grown U.S. forage legume, occupying nearly one-tenth of all U.S. cropland, and it is efficient in fixing nitrogen for plant use. The new alfalfa, expected to be available to growers in the late 1980's, also could be grown in some areas where land is now fallowed, plowed and left idle for a year. Such a vegetative cover would help prevent water and wind erosion of exposed land.

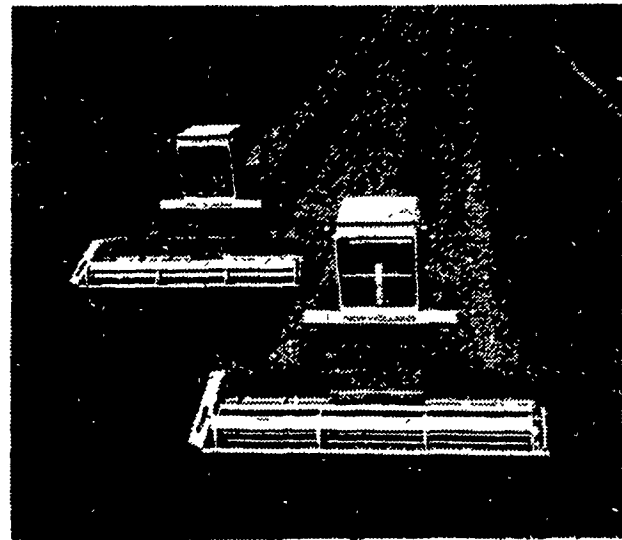
A major goal of the team is an alfalfa for use as an annual crop that, besides providing feed for livestock, will leave 150 pounds of nitrogen an acre for the following year's corn crop when plowed down. In limited field tests to date,

the team has increased grain yields by 11 percent as a result of added nitrogen provided a corn crop following an experimental alfalfa grown as an annual.

A team of scientists at Tifton, Ga. has developed a new hybrid bermudagrass, Tifton 44, that is so nutrition-rich that, as a cattle feed, it could add millions of pounds of beef a year to the marketplace. Cattle eating Tifton 44 have averaged daily weight gains that are 10 percent higher than beef gains on Coastal bermudagrass, the most widely used productive pasture grass in the South.

Tifton 44 is also more winterhardy than Coastal and can be grown throughout a 500-mile strip of land running from the South Atlantic States to Central Texas. Bermudagrass is a long-lived perennial with a vigorous spreading habit. It establishes a thick ground cover and rooting system that is noted for superior protection against losses of soil and water.

Reed canarygrass may move up on the forage popularity charts because of a new low-alkaloid strain soon to be available to growers. Gordon C. Marten, ARS agronomist, found in studies at St. Paul, Minn. that lambs grazing the new strain, MN-76, gained 0.26 pounds per head per day while lambs on such older varieties as Vantage gained 0.18 pounds and Rise, 0.15 pounds per day. Reed canarygrass is widely adapted particularly in the northern half of the United States for wet pastures and for waterways. It also does well on upland soils. However, it



has not been widely accepted by farmers because of its alkaloid content, low palatability, and problems with diarrhea. Only 3 percent of the lambs grazing MN-76 exhibited diarrhea in the 2-year pasture tests.

Scientists are determining more suitable cropping systems for legumes and breeding to improve legumes that are better adapted to acid soils, so common to the Northeast. This includes birdsfoot trefoil, ladino clover, and red clover — all of which produce nitrogen from soil atmosphere to enhance plant growth.

Dairy scientist H. J. Larsen, University of Wisconsin, Madison, found trefoil-grass haylage (or silage) at least equal to alfalfa-grass haylage. Trefoil is grown on more than a million acres in the northeastern United States where

soils are too wet for alfalfa. In the Wisconsin studies, dairy cows on the trefoil-grass haylage averaged 2.2 pounds more milk daily having 0.1 percent more butter fat. Some of the increase is attributed to higher grain intake by cows on the trefoil-grass haylage.

Agronomist Gordon C. Marten, ARS, St. Paul, Minn. tested lambs on a pasture system including birdsfoot trefoil and found they gained 23 percent more than lambs on alfalfa-grass pasture. The increase in meat produced more than offset the lower lamb carrying capacity an acre of trefoil.

Dairy nutritionist H. R. Conrad, Ohio State University, Wooster, found that ladino clover can make a good partner for alfalfa. Overseeded in alfalfa, ladino helped

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