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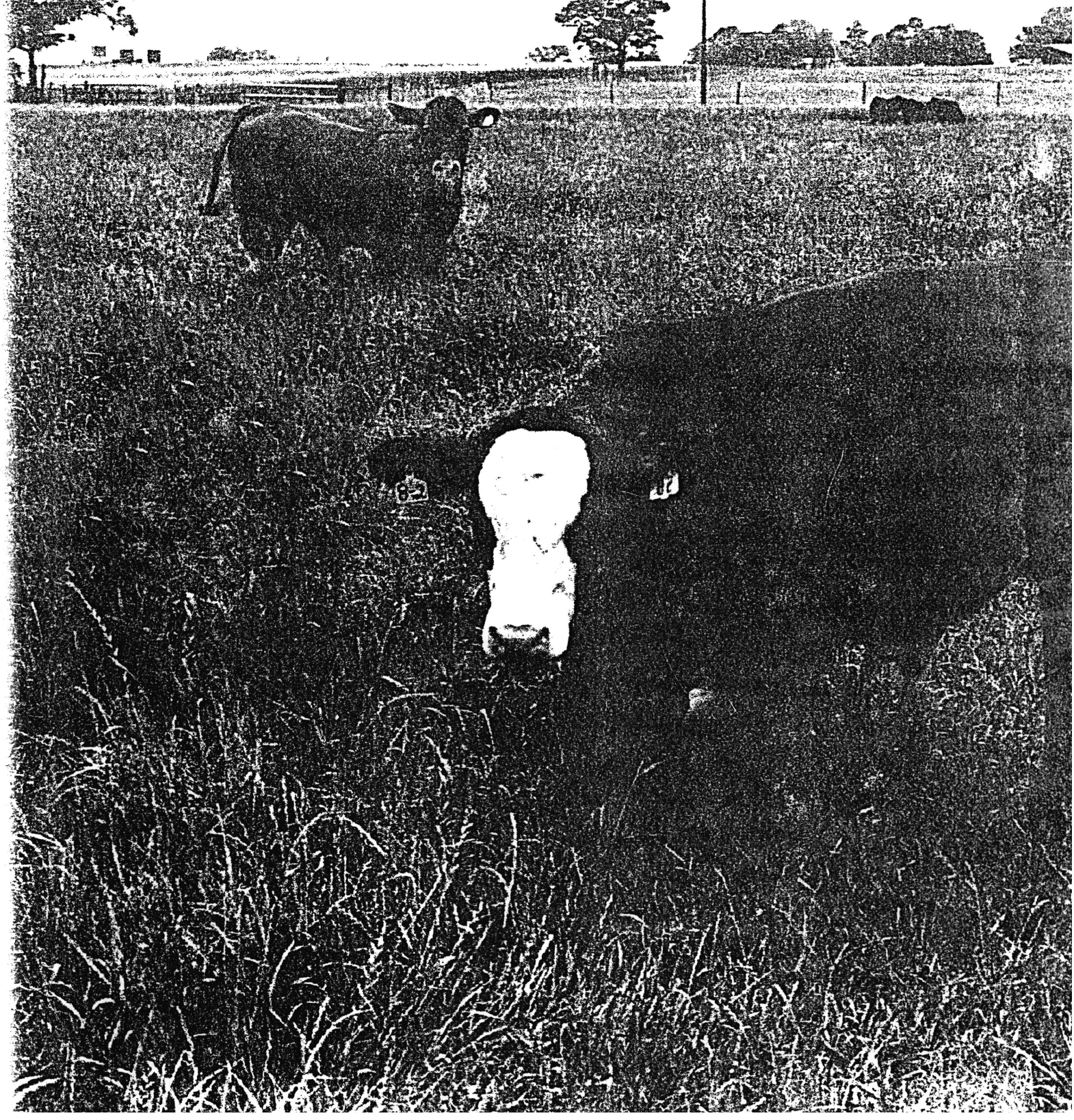
HIGHLIGHTS



Lupin Silage~ An Alternative Forage

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Alabama's growing season is ideally suited to double cropping, but corn silage, a major forage for dairy diets, needs to be planted earlier than the date which many winter crops are harvested. However, whole plant lupin, a winter legume, can be removed sufficiently early as silage to allow most summer crops to be planted. Research at AAES indicates that lupin silage can be used in place of corn silage in dairy diets without depressing milk yield and composition if diets are adequately balanced.

A typical double cropping system in Alabama often involves a cool season small grain such as wheat and warm season annual such as soybean that can be planted in June. Winter crops unduly delay planting corn and preclude temperate corn being double cropped. Therefore, some unconventional crops such as tropical corn and hybrid pearl millet may be more desirable because they can be planted later than temperate corn. Lupin, another unconventional crop, is a winter legume which may have agronomic advantages. Ensiling such crops may provide better double cropping options as ensiling removes crops earlier than if used for grain production. However, the economic values of such silage will depend upon their use in livestock rations. A study was conducted to compare the lactation responses of dairy cows receiving these unconventional silage-based diets to those fed conventional temperate corn silage-based diets. This was one aspect of a larger double cropping system approach which involved AAES departments and the USDA-ARS.

Approximately 55 tons each of corn, tropical corn, millet and lupin were ensiled into polyethylene bags during May-August 1995 at optimum maturity stages for the different crops. A lactation study was subsequently conducted at the E.V. Smith Research Center from January to April, 1996. Ten lactating Holsteins were assigned to each of six (three temperate corn and one each of tropical corn, millet, and lupin) silage-based diets. Cows

Effect of Silage on Dairy Cow Performances[1]

Silage-based diet	DMI	MY	BF	MP	BUN
	lb./day	*lb./day*	*pct.*	*pct.*	*mg/dl*
Temperate corn	49.9a	67.8a	3.5a	2.9ab	19.7ab
Tropical corn	43.6b	59.0b	3.8b	3.0b	18.6a
Millet	37.8b	57.9b	3.7ab	2.8a	21.1b
Lupin	43.1b	62.7ab	3.6ab	2.9ab	18.4a

[1]DMI = dry matter intake, MY = milk yield, BF = butterfat, MP = milk protein, BUN = blood urea nitrogen.
Means within column with different superscripts differ ($P < 0.05$).

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were maintained in tie stalls and individually fed diets free choice.

The compositions of temperate corn, tropical corn, pearl millet and lupin silage used in the diets were: dry matter (%) 41.4, 30, 30.4, 26; protein (%) 7.1, 8.8, 11.9, 13.9; soluble protein (% of total protein) 44.2, 41.9, 57.4, 55.2; acid detergent fiber (%) 21.3, 31.5, 29.9, 40.7; neutral detergent fiber (%) 41.1, 56.6, 52, 54.6; and net energy for lactation (NEL) (Mcal per pound) 0.70, 0.60, 0.63, 0.52. Diets were formulated to meet requirements for 75 pounds of milk yield per day and contained similar silage content. Other ingredients were varied to obtain an equal amount of protein (15.5 %), NEL (0.73 Mcal per pound), and mineral content. Milk, milk composition, feed intake, body weight and blood samples were collected for 11 weeks.

Weight gains of cows in this study were similar across diets (0.41 - 0.63 pounds per day). Cows fed the temperate corn silage diets consumed more feed than those fed tropical corn, millet, or lupin silage (see table). Although cows on the tropical corn silage or millet silage diet gave less milk, those on the lupin silage diet produced similar milk compared to that from temperate corn diets. Milk fat and milk protein were similar for all treatments. Blood urea nitrogen from cows fed millet silage was higher than that on other diets. Since blood urea nitrogen is considered to be an indicator of protein status, this may reflect poor protein utilization of millet silage. However, this did not affect milk protein content. Data on digestibility and utilization of these diets are being analyzed and the results will explain the differences on lactation performances among different diets.

Results from this study suggest that lupin silage may be used in dairy diets based on similar milk production and milk composition to that from conventional temperate corn silage-based diets. Further evaluation is needed to determine the economic value of production per acre when the entire double-cropping system is utilized. Research is also being conducted at AAES to develop improved varieties of disease-resistant lupin for the Southeast.

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Moving Air Repels

People don't like air blowing in their face, and neither do cockroaches!

Research by the Alabama Agricultural Experiment Station has shown that all stages of the German cockroach, the most common insect pest of home and commercial kitchens, can be repelled with moving air.

German cockroaches are important pests because they infest food and contaminate it with saliva and fecal material. Cockroaches can also transmit several pathogens and parasites, and their body parts and feces are potent human allergens.

A variety of tactics such as insecticidal baits, sprays, and dusts are used to control German cockroach infestations. Repeated use of the same insecticide often results in resistance making it more difficult to control these pests with insecticides. There are few non-insecticidal tactics available for development of integrated pest management (IPM) programs for cockroaches. Development of a nontoxic method to repel cockroaches could aid control by forcing cockroaches out of preferred and difficult to treat areas.

Moving air has been utilized to exclude house flies from the entrances of food-processing and storage facilities (air curtains). Utilizing moving air to augment German cockroach control could reduce the amount of insecticide applied by moving cockroaches out of hiding places and onto insecticide deposits.

To test the repellency of moving air, an electric version of the classic Ebeling choice box was developed (Figure 1). The electric choice box consisted of two parallel plastic pipes with an access hole between them. One pipe was painted black and equipped with a fan and restrictor plate to adjust air flow between 0 and 4.75 meters per second. Household forced air conditioning and heating systems produce air velocities of 4-5 meters per second at the vent register.