

## Evaluation of a Strip-cropping System Using Watermelons in a Bahiagrass Pasture

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Watermelons are an important vegetable crop in Louisiana. Acreage varies between 2,000-3,000 acres annually. Most of the acreage is in hilly areas of the state where watermelons are rotated on a three- to five-year basis with perennial forage crops.

Tilling in established pastures to plant melons can subject the land to serious erosion if proper soil conservation structures and practices are not put in place well before planting. Watermelon growers frequently rent pasturelands for one cropping season with the understanding of leaving the land in such a condition that it can be returned to pasture or hay meadow without added input from the landowner. After the watermelon crop is removed, the land must be disked and leveled to accommodate machinery. If high rows and deep furrows are formed, then several passes with a disk and harrow are needed to re-form the land. Any extra trips across the field add to the expense of producing a watermelon crop and greatly increase the risk of soil erosion. The time lapse is increased between the watermelon crop and return to pasture for grazing or hay.

Strip-cropping has long been used to reduce soil erosion when growing crops in hilly terrain. There are several versions of this system, but most involve using grass strips grown parallel to strips of row crops. This reduces the risk of soil loss by changing the direction and speed of rainwater flow.

Watermelons are grown on rows varying from 4 to 12 feet, depending on equipment and intensity of management. Row width is usually dictated by equipment on hand. On hill soils, under average management condition, rows are spaced 8 to 12 feet to accommodate machinery. Research has shown that row width and in-row spacing can be manipulated in various arrangements to achieve 36-48 square feet per hill. This allows for a 42- to 48-inch intensively cultivated area surrounding the plant row, and the area between rows is kept clean by disking one to three times. It is especially important for the area between rows to be free of weeds when vines begin to grow out of the cultivated zone into disked area.

An alternative to disking between rows is to use some form of chemical control to reduce grass competition for relatively short periods to allow the watermelon crop to mature. Watermelon plants grow fast, and under good growing conditions can compete with bahia and other grasses for a short time, mainly because of shading. Sublethal rates of glyphosate (Roundup®) have been used for many years for chemical mowing of orchards and roadsides. Rates of 16 to 20 ounces per acre applied three to five days after mowing have eliminated the need to mow orchards for five to eight weeks. Results vary according to the species present. Pensacola bahia and common bermuda grass are both subdued at these lower rates. Other grass species present can affect the length of time between mowing.

One important aspect of using this method is that you must have a spray rig that is calibrated and in good working condition. A boom sprayer with a cover or hood to prevent drift on to the crop is necessary in most cases. The objective is to slow growth without killing the plant. When sublethal dosages are applied, grasses will resume a normal growth pattern after about six weeks.

The experiments were conducted at Idlewild Research Station near Clinton, in East Feliciana Parish, La., for two consecutive years, 2000 and 2001. The plots were located on a hillside with a 6 percent to 7 percent slope on a silt loam soil. Site preparation began in February of each year. The entire area was mowed to a height of 2 to 3 inches. A strip was tilled 4 feet wide every 12 feet in an established pasture consisting mainly of Pensacola bahiagrass.

During the first week of March, fertilizer was applied in a band in the tilled strip at the rate of 78-78-78 pounds of N-P-K (600 pounds of 13-13-13) per acre. Seeds of 'Louisiana Sweet' watermelon were planted about March 20 in hills 4 feet apart or about 907 per acre. When plants were fourth true leaf stage, they were thinned to two per hill. Plants

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**Table 1. Yield of 'Louisiana Sweet' watermelon grown in a strip-crop system in a Bahiagrass pasture 2000-2001.**

Year	marketable wt /acre	Weight per melon
2000	15,237	31
2001	10,862	21
Average	13,049	26

were cultivated twice to remove weeds in the plant row. At the second cultivation a sidedress application of ammonium nitrate (100 lbs/acre) was added in a furrow 8 to 10 inches from plant. An application of Poast® herbicide was applied to control grasses in plant row when vines were 24 inches long.

The area between rows was left undisturbed until the final cultivation of the watermelon plants. The grass was mowed to a height of about 3 inches. Seven to 10 days after mowing, glyphosate at a rate of 1 pint per acre was applied with a shielded boom. The application was timed so that the vine tips were within 6 to 10 inches of the grass strip.

In both years, melons were harvested twice at 10-day intervals. Ripe melons of 15 pounds or heavier were harvested and weighed. After the last harvest, the entire area was mowed to remove vines and melons. An undisturbed area of bahiagrass adjacent to the watermelon plots was selected and treated in a similar manner. After harvest on July 16, 2001, the fields were mowed and 100 pounds per acre rate of ammonium nitrate applied. On August 20 and September 24, 2001, the area was cut and baled for hay. Each bale of hay harvested was weighed.

Yields of marketable watermelons were 15,237 pounds per acre, with an average of 31 pounds per melon in 2000, and, in 2001, yields were 10,862 pounds with an average weight of 21 pounds per melon. In 2001 we also measured the amount of hay that could be harvested from the melon

**Table 2. comparison of amount of hay harvested from an undisturbed field of Bahiagrass to a field previously strip-cropped with watermelons. Spring 2001.**

	Yield of hay from undisturbed area lbs/acre	Yield of hay from strip-cropped area lbs/acre
1	1,039	2,453
2	1,039	880
total	2,078	3,333

fields in the same growing season. More than 3,000 pounds per acre of hay was harvested after the watermelons were removed. The yields obtained in this study were somewhat low because of wide spacing (12 feet) between rows. In 2000 rainfall was scarce and subsequent soil erosion observations were limited. In June 12-16, 2001, more than 16 inches of rain fell. The watermelon vines were 24 to 36 inches in length and covered the plowed area. No apparent signs of soil loss occurred during this heavy rainfall.

The adoption of strip-cropping of watermelons in permanent pastures returns the land back to grazing or hay production within the same growing season, thereby increasing profitability for the landowner.



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