

***Louisiana Transportation Research
Technical Assistance Report
Report No. 13***

***Pilot Project for an Improved Sugar
Cane and Harvest and Transport
System***

**Materials Group
December 1997**

LTRC

Louisiana Transportation Research Center

Sponsored Jointly by the Louisiana Department of Transportation and Development and Louisiana State University

**PILOT PROJECT FOR AN IMPROVED SUGAR CANE
HARVEST AND TRANSPORT SYSTEM**

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by

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INTRODUCTION

In March of 1995, Jackie Judice of Northside Planting Company, along with state Senator Craig Romero, visited the Louisiana Transportation Research Center (LTRC) to request assistance in demonstrating and implementing a new harvest and transport system for sugar cane. The new system provided a potential solution to many of the current problems caused by the burning of cane fields, traffic accidents and congestion resulting from field equipment using the roads, increased pavement damage from heavily loaded transport vehicles, and various environmental impacts from milling and transport operations. The system harvests green cane directly into export-type crates that can be hauled on standard highway trailers that are then pulled by vehicles operated by commercial drivers. Harvesting green cane eliminates environmental concerns caused by burning, produces a higher percentage of sugar from cane, and improves field conditions by leaving a vegetative cover which enriches the soil and controls erosion.

LTRC's primary interest in this effort related to the positive impact this technology offered in terms of reduced damage to pavement and increased roadway safety. An additional objective was the furtherance of intermodal objectives to increase truck-rail transfer facilities to decrease the effect of handling agricultural commodities by roadway.

Jackie Judice, Craig Romero, and the American Sugar Cane League worked with LTRC to develop a proposal for this project. A project review committee was selected which included

representatives of the Department of Agriculture and Forestry, Department of Economic Development, Department of Environmental Quality (DEQ), Department of Transportation and Development, the American Sugar Cane League, and other interested parties. The committee unanimously approved of the project.

U. S. Senator John Breaux and the political leadership of St. Mary and Iberia Parishes identified funding sources. LTRC in conjunction with the project team, and in cooperation with Janice Dickerson, manager of the DEQ environmental justice section, were able to garner \$139,200 of support for the 1995 harvest season, \$99,200 from the Governor's Office for Rural Development and \$40,000 from DEQ. With an additional \$99,200 for the 1996 season from the Governor's Office for Rural Development; total funding from state agencies was \$198,400. LTRC provided only staff support in facilitating this effort as a demonstration project.

BACKGROUND

Sugar cane was first brought to Louisiana by Pierre Le Moyne Sieur d' Iberville, but little was grown until 1751 when a better variety from Santo Domingo was introduced. The juice was boiled down into a thick mass which was used for sweetening purposes as well as for making an alcoholic drink called "tafia." After 1776, the planting of cane had almost been abandoned because Louisiana sugar cane could not be made to granulate. In 1794, Étienne de Boré began planting sugar cane on his plantation near the present Audubon Park in New Orleans and he made an annual profit of \$12,000.

Since that beginning, the Louisiana sugar industry has grown tremendously with 32,000 workers in 23 parishes now cultivating over 380,000 acres of sugar cane. More than a million short tons of raw sugar and 45 million gallons of molasses are produced in the state each year. The economic value of the industry is in excess of \$1.2 billion per year.

CURRENT HARVEST AND TRANSPORT SYSTEM:

Sugar cane has to be harvested during a short period of time which extends roughly from the first of October to the end of December (approximately 90 days). A double row cutter, “soldier” harvester, cuts stalks even with the ground while removing the tops and piling the stalks across the rows behind the harvester.

The stalks are burned to remove the leaves, but the flame is not hot enough to damage the stalk. Mechanical loaders lift the burnt-over stalks into field wagons, which are either towed directly to the mill by the tractor or towed to a transloader station for transfer to highway trailers. After arriving at the mill, the cane is weighed, sampled, and washed before being milled.

The current system has several disadvantages:

1. Field equipment on the roadway causes many problems--tracked mud, spilled cane, and traffic congestion. In addition, overweight loads damage the road.
2. Lodged cane and poor field conditions are a challenge for the “soldier” harvester.
3. Burning of cane reduces sugar content and causes environmental concerns.
4. The mechanical field loader picks up soot, debris, and mud with the stalks. Some of this ends up on the roadway in addition to requiring extra washing at the mill.
5. Transferring the stalks at the mill is inefficient and wastes cane.

PROPOSED HARVEST AND TRANSPORT SYSTEM:

The new combine harvester cuts the stalk at ground level, removes and shreds the tops and leaves, sprays the shredded material onto the field, and cuts the stalk into billets which are loaded into standard transport containers. The billets are about ten inches in length, but can be longer.

These containers are loaded on tracked field trailers which are towed by tracked tractors. The loaded trailers are towed to a transloading site and transferred to a standard highway trailer for delivery to the mill.

This clean-harvested cane has several advantages over the current method:

1. Cane loads can be controlled so as not to exceed standard highway permit load, thus decreasing damage to the roadways.
2. The new combine harvester shows a definite agronomic advantage over the current system with lodged cane and heavy tonnage cane.
3. Shredded material provides a thick carpet of mulch which enriches the field and helps control weeds.
4. Tracked field vehicles can work in poorer field conditions than the "soldier" harvester and do not track mud onto the roadway.
5. Trucks can travel at standard highway speeds, day or night, with minimum spillage.
6. Sugar yields are higher because of the following:
 - A) Time between cutting and milling is shortened

- B) Cane left in field and spilled on the roadway is minimized
 - C) Efficiency of transfer at the mill is improved
 - D) Washing of the cane is reduced or eliminated.
7. Environmental concerns are alleviated because of better control of:
- A) Burning of cane fields
 - B) Spillage of cane onto the roadway
 - C) Holding ponds to contain wash water
 - D) Chemicals used for fertilizing and spraying.
8. Improves highway safety by reducing or eliminating:
- A) Spillage of cane stalks and tracking of mud on the roadway
 - B) Traffic congestion caused by field tractors and overloaded trucks on the roadway
or by smoke from burning fields blowing across the road
 - C) Slow-moving vehicles without standard safety inspections.

IMPLEMENTATION

Implementation has been very effective as is proven by the increased use of the green cane harvester. The 10 harvesters used in Louisiana during the 1995 season increased to 60 for 1996 and then to 150 for the 1997 season. The use of the new harvester led to a corresponding increase in the planting of high-yield cane and a reduction in the burning of cane fields and cane spillage on the highway. One of the best examples of the advantages of the new harvester occurred during the 1997 season. A tornado-like weather disturbance leveled a cane field at Northside Planting Company and the cane was harvested without loss.

The advantages of the new system have been documented in an LTRC video and publicized by the American Sugar Cane League and the American Association of Sugar Cane Technologists.

WBRZ Channel 2, in Baton Rouge has had two special bulletins on the new harvester, and the news media in New Orleans, Baton Rouge, Lake Charles, and New Iberia have had lead stories on the new system. Senator Romero held a press conference on December 8, 1997, in New Iberia on the topic of transporting cane by rail. The L & D Railroad held a press conference at the Port of Lake Charles on December 9, 1997, to announce the first planting of cane in Calcasieu Parish and the first transport of cane by rail in more than thirty years.

The successful implementation of this improved harvest and transport system directly resulted in the formation of the Lake Charles Cane Cooperative, Inc., which harvested the first cane in Calcasieu Parish in 1997. The 35,000 ton harvest was transported from the L & D rail loading

site in Calcasieu Parish to Baldwin in St. Mary Parish by rail - the first transport of cane by rail in more than thirty years. Expenditures by cane growers, mill owners, and the L & D Railroad to make rail shipment possible totaled approximately 3.3 million. The major expenditures provided the loading site in Calcasieu Parish, the offloading site at Baldwin, additional highway containers, additional storage at the mills, and labor and equipment for the railroad. A \$1,800,000 grant from the 1997 Freight Railroad Intermodal Grant Program, as a loan from the Department of Economic Development, has been promised to offset those expenditures.

Shipping 35,000 tons by rail removed approximately 1600 truck loads of cane from the highways during the 1997 harvest season. At least 12,000 loads can be removed from the highways during the 1998 season if Calcasieu Parish cane production projections are correct and the harvest increases to 300,000 tons. The Cooperative has plans to put 100,000 acres into sugar cane cultivation in Acadia, Allen, Calcasieu, Cameron, and Jefferson Davis Parishes during the next five years. That production will generate 134,000 truck loads during the 90-day harvest season if the cane cannot be delivered by rail. A railroad company and some cane farmers in the Bunkie area have also shown interest in bringing the rail program to that area.

Conservative estimates place the increased highway maintenance costs resulting from putting an additional 134,000 truck loads on the roadways between the Lake Charles harvest areas and the mill at close to \$25,000,000 over the next five years. The actual cost will probably even greater due to the rural nature of the roads and the fact that they were not designed for heavy trucks.

Conclusions:

This new green cane harvest and transport procedure enables growers to maintain optimum production levels without increasing costs other than the new equipment needed to implement the system. Using high-yield varieties of cane and more efficient transportation methods should offset those initial costs and improve the economic picture for the entire sugar cane industry.

The containers used in the new harvest and transport system can be transported by rail car as easily as they can by truck. Transporting them by rail last year removed 1,600 trucks from the roadway and will remove a projected 12,000 truck loads in 1998. Trucking will increase to 134,000 loads over the next five years and cost approximately \$25,000,000 in highway maintenance if the rail transport program is not implemented.

In addition, public concerns for the environmental problems created by the current process will be dramatically reduced if not entirely eliminated with the new process.

Acknowledgments:

Funding and in-kind services for this project were provided by Northside Planting Company; Sterling Sugars, Inc.; the American Sugar Cane League of the USA, Inc.; the Environmental Justice Section of the Louisiana Department of Environmental Quality; the Iberia Parish Government; and the Governor's Office for Rural Development.

The Louisiana Transportation Research Center coordinated the funding among the state agencies involved and produced a video which documents the program.