



February 1996

SCRAP TIRE MANAGEMENT IN NORTH CAROLINA

The disposal of scrap tires presents unique environmental problems and difficulties. North Carolina has a comprehensive management program to provide for the safe management and disposal of scrap tires.

Environmental issues associated with scrap tire disposal

Whole tires cannot be landfilled satisfactorily because they use large amounts of space, cannot be compacted, and tend to “float” to the surface due to vibration and the presence of trapped gas.

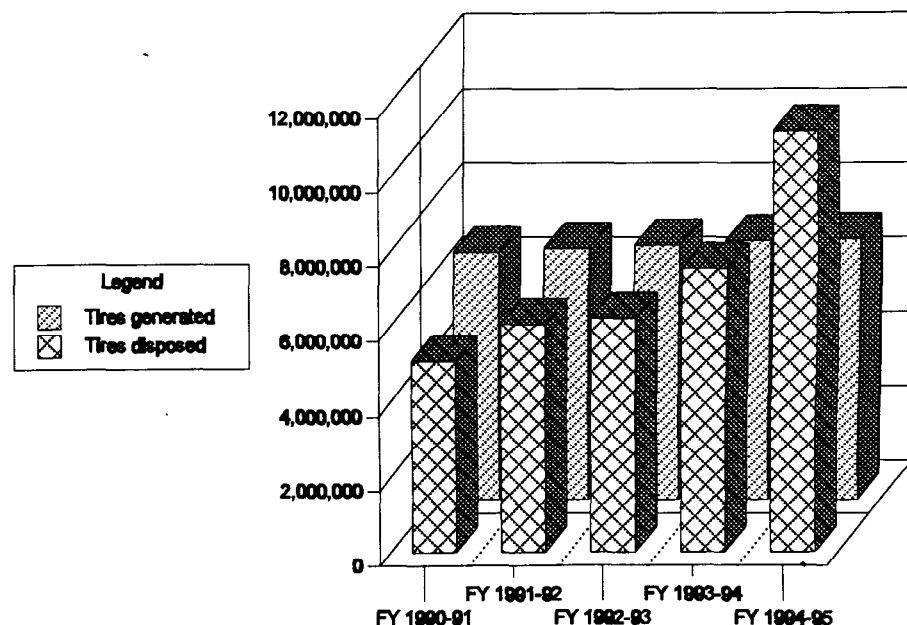
Nuisance tire sites or illegal “tire dumps” are believed to be responsible for introducing the Asian Tiger Mosquito (*Aedes albopictus*) into North Carolina. This is an aggressive exotic species which thrives in tire dumps and is capable of carrying the deadly eastern equine encephalitis.

Nuisance tire sites also pose special fire risks because it is difficult to cut off the oxygen supply and extinguish such fires. Tire fires produce hazardous air emissions and toxic liquid run-off. Recent Environmental Protection Agency research on uncontrolled tire fires has identified cancer-causing

agents in the smoke. (The *Mutagenicity of Emissions from the Simulated Open Burning of Scrap Rubber Tires*. July 1992. EPA Air and Energy Research Laboratory and Health Effects Research Laboratory, RTP, NC)

Number of tires generated in North Carolina
As a rule of thumb, the number of scrap tires generated each year is equal to population.

Fig 1 : Tires generated and disposed



Since the 1995 population of North Carolina was about 7 million, it is estimated that an equal number of tires were generated during FY 1994-95. This standard is representative of tire generation in North Carolina, based on comparisons with tire sales and scrap tire disposal tax collections in the state.

The numbers of tires collected has increased each year, which reflects the success of the tire program. The program has become more firmly implemented as awareness of the regulations and cooperation of affected parties has increased. Illegal tire dumping has declined and tire recycling rates have increased.

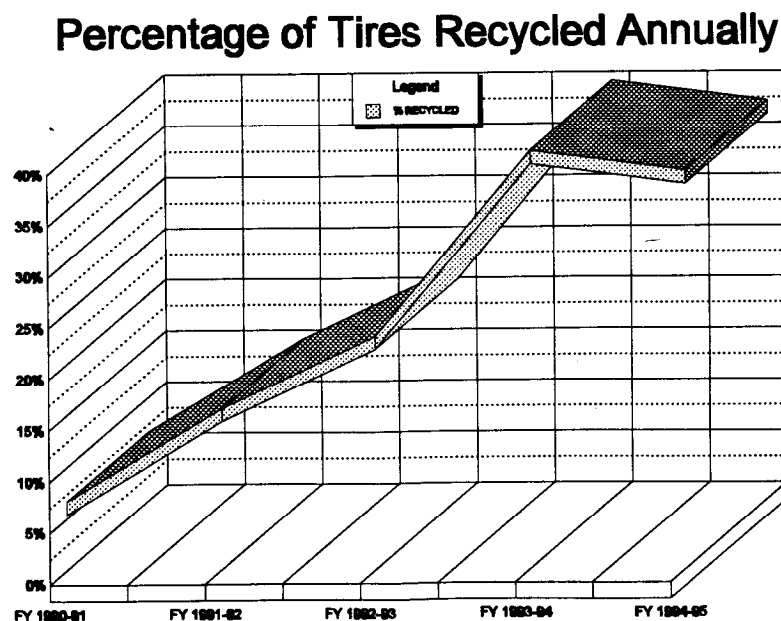
However, part of the large increase in numbers of disposed tires this past year is likely due to illegal disposal of out-of-state tires at county collection sites. The Solid Waste Section is helping counties implement policies to avoid receiving such tires. These include:

- Improving screening of tire loads by requiring complete scrap tire certifications. These forms provide details on the origin of each load;
- Visiting generators to discuss tire program requirements;
- Making spot checks of loads by calling to verify the origin and size of loads brought by haulers; and
- Requiring documentation of origin of tires brought to county sites for free disposal.

The section provides assistance by visiting county collection sites, reviewing the scrap tire programs, reviewing certifications, and making suggestions for improvement. Efforts made to avoid abuse is a factor in eligibility for grants from the Scrap Tire Disposal Account to cover cost over-runs.

Tire recycling

Tire recycling has increased during the past five years. There are four permitted tire recycling firms in North Carolina. These firms diverted from landfills approximately 3.1 million scrap tires or about 41 percent of the total 7.6 million scrap tires in FY 1993-94.



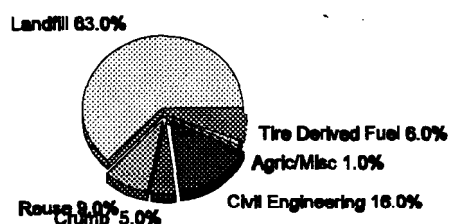
Approximately 37 percent of the 11.3 million scrap tires were recycled by the four firms in FY 1994-95. These tires were used as tire derived fuel (TDF), asphalt, used tires, retreading, agricultural products, civil engineering products, and miscellaneous products. Tires can be recycled in various ways as described below.

- ▶ Tire Reuse, Re-manufacturing and Retreading - A large portion of scrap tires have sufficient tread remaining to be sold on the used tire market. Additionally, many can be retreaded and remanufactured.
- ▶ Tire Derived Fuel (TDF) - About 6 percent of the scrap tires managed in North Carolina are used as tire derived fuel. This is a small portion of total tires because there are currently no users of TDF in North Carolina. Tires are shipped to Virginia and Georgia.

Crumb Rubber - Two North Carolina companies process scrap tires to crumb rubber. Crumb rubber can be used as a component of asphalt for road construction. Also, crumb rubber 40-mesh is a commodity and can substitute for plastics and other polymers in manufacturing products in the plastics industry. However, growth in this area will require a research and development commitment by large chemical companies. Eventually, crumb rubber may compete with virgin materials used by the plastics industry.

Agricultural and Miscellaneous Products - About 1 percent of the scrap tires discarded in this state are shredded by the North Carolina recycling firms and sold for agricultural and other miscellaneous applications. Agricultural products include livestock bedding mats, and other miscellaneous items include mats, solid rubber wheels, barricades, and loading dock stops.

End Uses of Disposed Tires



Civil Engineering: Applications - About 16 percent of the scrap tires discarded in North Carolina are shredded and sold for civil engineering applications. A significant portion is used as septic tank drainfield aggregate in South Carolina.

Costs of Tire Disposal

The North Carolina Scrap Tire Disposal Act in 1989 banned the landfilling of whole tires. Only tires that have been cut or shredded can be landfilled. These requirements have added significant additional costs to tire disposal. Local governments are prohibited from passing these costs on to scrap tire disposers, since higher tipping fees result in increased illegal dumping along roadsides and in streams and woodlands.

To avoid these problems a 2 percent disposal fee is charged at the point of sale of new tires. This makes it possible to collect the additional funds needed for tire disposal and to distribute these funds to counties to pay for scrap tire management. Costs and income were as follows:

Fiscal Year	Tax Proceeds Received By All Counties	Total Cost of Tire Programs in All Counties	Average Cost Per Scrap Tire
FY 1990-91	\$3,170,439.96	\$4,070,463.63	\$1.29
FY 1991-92	\$3,754,010.71	\$4,902,101.09	\$1.57
FY 1992-93	\$3,529,593.79	\$4,746,711.80	\$1.56
FY 1993-94	\$4,462,165.32	\$5,440,021.48	\$1.02
FY 1994-95	\$5,675,341.48	\$5,634,340.89	\$1.02

In addition to the tax proceeds distributed to the counties, a portion of the proceeds fund the state program to clean up nuisance tire sites. A total of 241 nuisance tire sites have been identified containing a total of 4.1 million tires. More than 2 million tires at 108 of these sites have been cleaned up, and the remainder will be cleaned up by the end of 1997.

The tire disposal tax will be reduced to 1 percent for passenger tires in July 1997, and it is anticipated that county disposal costs will exceed income by \$2,381,500. To obtain these funds for disposing 93,000 tons of tires, counties will need to charge about \$25.60 per ton. This would be about 26 cents per passenger tire, \$1.28 per truck tire, and \$6.40 per 500-pound off-road tire.

Summary

North Carolina has operated a comprehensive scrap tire management program in all 100 counties since 1990, which has resulted in decreased illegal dumping and increased scrap tire recycling.

Additional Information

For more information about the North Carolina scrap tire management program, request:

Fifth Annual Scrap Tire Management Report 1994-1995

For more information about recycling of tires and other materials request:

North Carolina Recycling Market Assessment - Office of Waste Reduction 800-763-0136

For more information see the Division of Solid Waste Management homepage at <http://www.wastenot.ehnr.eta.nc.us>

Solid Waste Section

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