

## **Leaf Mulching in New Jersey – 10 Year Impacts Research Summary**

Field crop and other farmers need alternative sources of farm income and environmentally sound inputs to aid in crop production, increase revenue, and remain in business. Leaf mulching is the application of collected shade tree leaves to agricultural land. Daniel Kluchinski, County Agent I/Professor, coordinated a research and outreach program between 1989 and 2000 to determine the logistics of on-farm use; the impact on agricultural production; the extent of use by farmers and municipalities; and the obstacles to greater use of this beneficial practice.

Kluchinski conducted two surveys of New Jersey leaf mulching farmers in 1994 and 1999 (five and ten years after leaf mulching became an allowed beneficial use in the state) to determine adoption, use and impact of the practice. Data from these two surveys showed increased adoption over the 10-year period studied.

### **Farmer Adoption**

- The practice was increasingly adopted with 68 farmers identified as the population of leaf mulching operators in NJ between 1988 and 1993. Between 1994 and 1998, the number of farmers adopting the practice nearly doubled to 133 operators.

### **Farmer Production Benefits**

- The most significant advantage identified in both surveys was increased soil organic matter. Research by Kluchinski and Dr. Joseph Heckman, Rutgers Extension Specialist in Soil Fertility, showed that soil organic matter can increase by 0.5-0.7% with annual applications over 3 years (typical NJ agricultural soils have less than 2% organic matter). Other advantages commonly cited by respondents were improved soil moisture holding, improved soil tilth and structure, and fertility.
- Farmers adopting the practice were able to reduce soil erosion over the winter. Leaves applied and incorporated into the soil provided between 53% (3 inch applications) and 76% soil coverage (6 inch applications). This savings in soil is greater than a traditional fall planted rye cover crop and helped to improve environmental quality by reducing sediment deposition into streams, rivers and lakes. This work was conducted in cooperation with Mr. Fred Kelly, USDA-NRCS, in New Jersey.

### **Farmer Economic Benefits**

- An application rate of 6 inches/acre (20 dry tons/A) contains over 400 pounds of nitrogen, 92 pounds of phosphate, 182 pounds of potash. The nutrients in the leaves have a computed value of \$146/acre. This would equate to a total average fertilizer value of \$2,730 per operator based on their 18.7 average

acreage of leaf mulching. (NOTE: This data is based on 2004 nutrient prices and therefore do accurately reflect current values.)

- The average farmer in 1998 accepted 6,106 cubic yards of leaves annually and received an average of \$3.13 per cubic yard to accept the leaves.
  - Based on this tipping fee, leaf mulching provided an additional \$19,111 in gross revenue to the average operator.
  - Projected to the 133 leaf mulching farmers, they would receive \$2.54 million dollars for accepting leaves.
- Kluchinski and Dr. Donn Derr, Rutgers Agricultural Economist, determined the best methods to spread and incorporate leaves to reduce time and labor.
  - Using these methods, farmers saved \$0.75 per cubic yard compared to composting.
  - The average farmer saved \$4,580 per year.
  - The savings for the 133 leaf mulching farmers in 1998 were projected to be over \$609,000 dollars by using this practice rather than composting.

### **Societal Impact**

- Results from both surveys showed that farmers had interest in expanding their leaf mulching operations.
  - By 1998, the average size operation accepted 6106 yd<sup>3</sup> of leaves, an increase by 868 yd<sup>3</sup> of leaves over 1993 amounts.
  - The intent to expand in the future was indicated by 47% of respondents; the preferred average amount of expansion was 7925 yd<sup>3</sup>.
- It is projected that 6.8% of the 6.1 million yd<sup>3</sup> of leaves collected annually in NJ were leaf mulched in 1993. Due to an increase in the number of leaf mulching farmers, by 1998, the amount increased to 8.4%. This shows municipalities and communities continued to adopt the practice as an alternative in dealing with this material.