

**National Association of RC&D  
Councils (NARC&DC) Report:**

***RC&D Survey of Agroforestry Practices***

---

**Spring, 2000**

---

This report summarizes the results of a national survey on agroforestry that was completed by Resource Conservation and Development (RC&D) Councils during the summer of 1999. The survey was designed to determine the extent and geographic location of agroforestry throughout the United States. Maps and graphs are used to illustrate where agroforestry practices are being used, where RC&D Councils are involved in agroforestry projects, and where there are opportunities to apply more agroforestry. It also suggests what types of assistance will be needed to enable landowners and support agencies to better advance the adoption of agroforestry.

*Agroforestry is the integration of agriculture and forestry practices into land use systems that can conserve and develop natural resources while increasing economic diversity at both the farm and community level.*

*Agroforestry does not convert agricultural land to forests, but rather leaves the land in production agriculture, while integrating trees into farm/ranch operations.*

*It can provide solutions for agricultural producers on both large and small farms and ranches, and also provide benefits for rural communities.*

# Executive Summary

---

Of the 315 RC&D's in the United States, 222 completed the survey (71% return). Of these, two-thirds have had direct involvement in agroforestry projects. The survey showed that the use of, interest in, and demand for agroforestry is extremely high in all regions of the country. The report provides details on the six major agroforestry practices of:

- 1) alley cropping,
- 2) forest farming,
- 3) windbreaks,
- 4) riparian forest buffers,
- 5) silvopasture, and
- 6) special applications.

To better promote all of these practices, four common elements were identified as needing increased attention.

- **Markets** — Markets need to be developed or expanded to increase the adoption of some agroforestry practices. Some RC&D's are already working with partners to identify or create niche markets, but greater involvement by USDA agencies, like the Agricultural Marketing Service and Rural Development is needed.
- **Landowner Information and Education** — There is a need to demonstrate the economic benefits of many agroforestry applications. RC&D areas can help local partners reach the landowner, but need support to develop educational material. The USDA National Agroforestry Center and other technical organizations should work closely with RC&Ds to better assist landowners.
- **General Public Education** — Increased effort is needed to inform the public about the benefits they receive from agroforestry. RC&D Councils can incorporate this information into their regular education program where agroforestry fits their goals and objectives.
- **Assistance to RC&D** — RC&D's need more financial resources to allow them to bring together landowners and communities with the relevant local, state, and federal partners.

---

*This report was prepared by the National Association of Resource Conservation and Development Councils (NARC&DC), which represents the 315 RC&D Councils throughout the United States and its territories. The RC&D Councils represent multi-county areas that work to improve the natural resources, economic viability, and standard of living in their area. All programs and assistance are available without regard to race, color, national origin, age, sex, religion, marital status, or disability.*

# Table of Contents

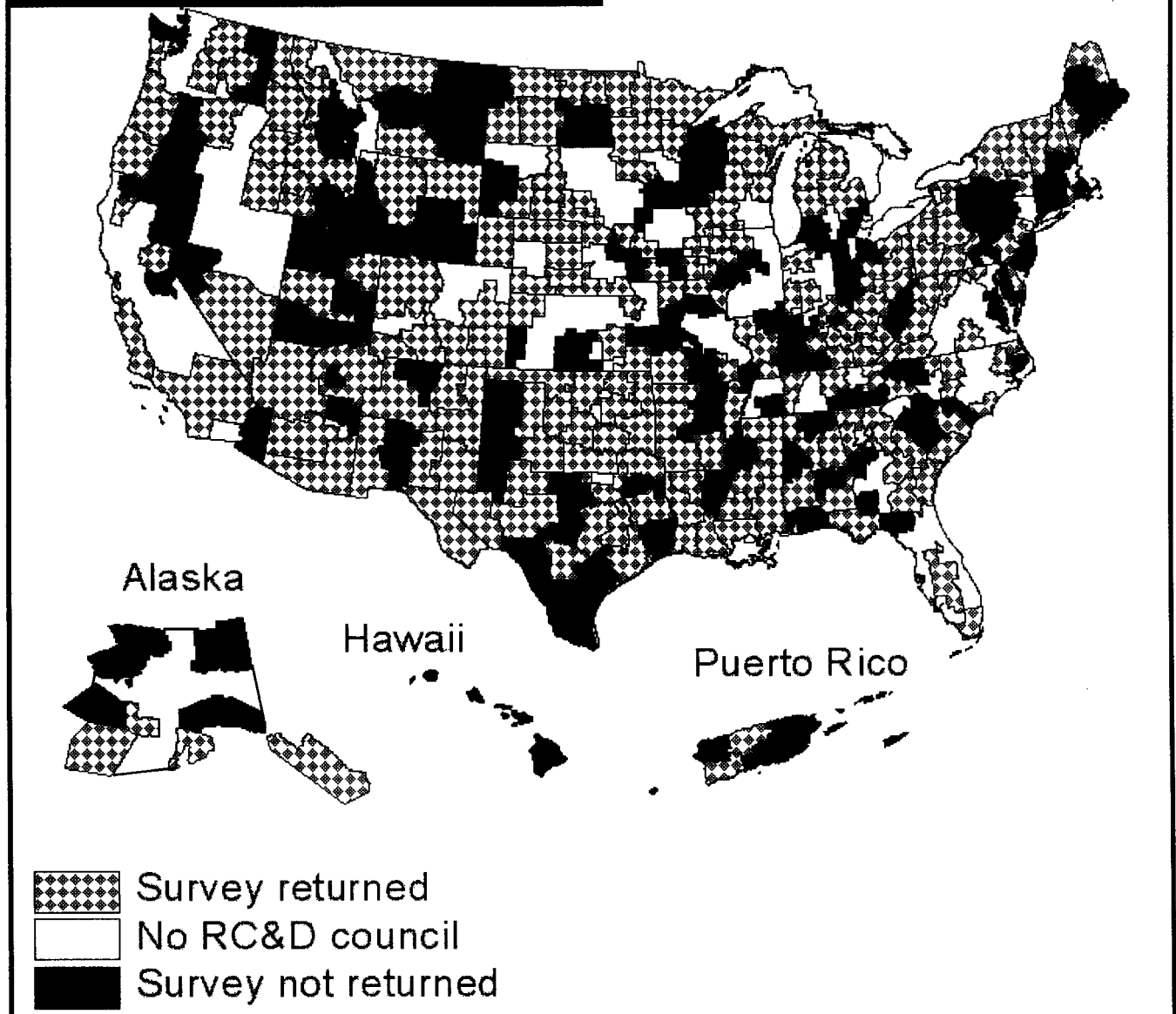
Executive Summary .....	i
Table of Contents .....	ii
<b>Methodology .....</b>	<b>1</b>
Map 1    RC&D Survey on Agroforestry .....	1
Map 2    RC&D Areas With Agroforestry .....	2
Graph I    Frequency of Agroforestry Practices .....	3
<b>Alley Cropping .....</b>	<b>5</b>
Map 3    Alley Cropping .....	5
Graph II    Frequency of Alley Cropping Reported .....	6
Graph III    Issues Addressed by Alley Cropping .....	6
<b>Forest Farming .....</b>	<b>9</b>
Map 4    Forest Farming .....	9
Graph IV    Frequency of Forest Farming Reported .....	10
Map 5    Map of Ginseng Reported .....	11
Map 6    Map of Mushrooms Reported .....	11
<b>Windbreaks .....</b>	<b>13</b>
Map 7    Windbreaks .....	13
Graph V    Frequency of Windbreaks Reported .....	14
Graph VI    Issues addressed by Windbreaks .....	14
<b>Riparian Forest Buffers .....</b>	<b>17</b>
Map 8    Riparian Forest Buffers .....	17
Graph VII    Issues Addressed by Riparian Forest Buffers .....	18
<b>Silvopasture Systems .....</b>	<b>21</b>
Map 9    Silvopasture Systems .....	21
Graph VIII    Issues Addressed by Silvopasture .....	22
<b>Special Applications .....</b>	<b>25</b>
Map 10    Special Applications .....	25
Graph IX    Issues Addressed by Special Applications .....	26
Sources of Assistance .....	29

# Methodology

This report is the result of a public/private partnership to collect, compile, and analyze information about agroforestry in the United States. The report is one of the steps towards achieving the NARC&DC vision of "RC&D - Partnerships Serving America's Communities."

The USDA National Agroforestry Center (NAC), established in 1992, is a partnership of the Natural Resources Conservation Service (NRCS) and the Forest Service (FS). The NAC wanted to learn more about the extent of agroforestry across the country and increase the agroforestry awareness

## *RC&D Survey on Agroforestry*

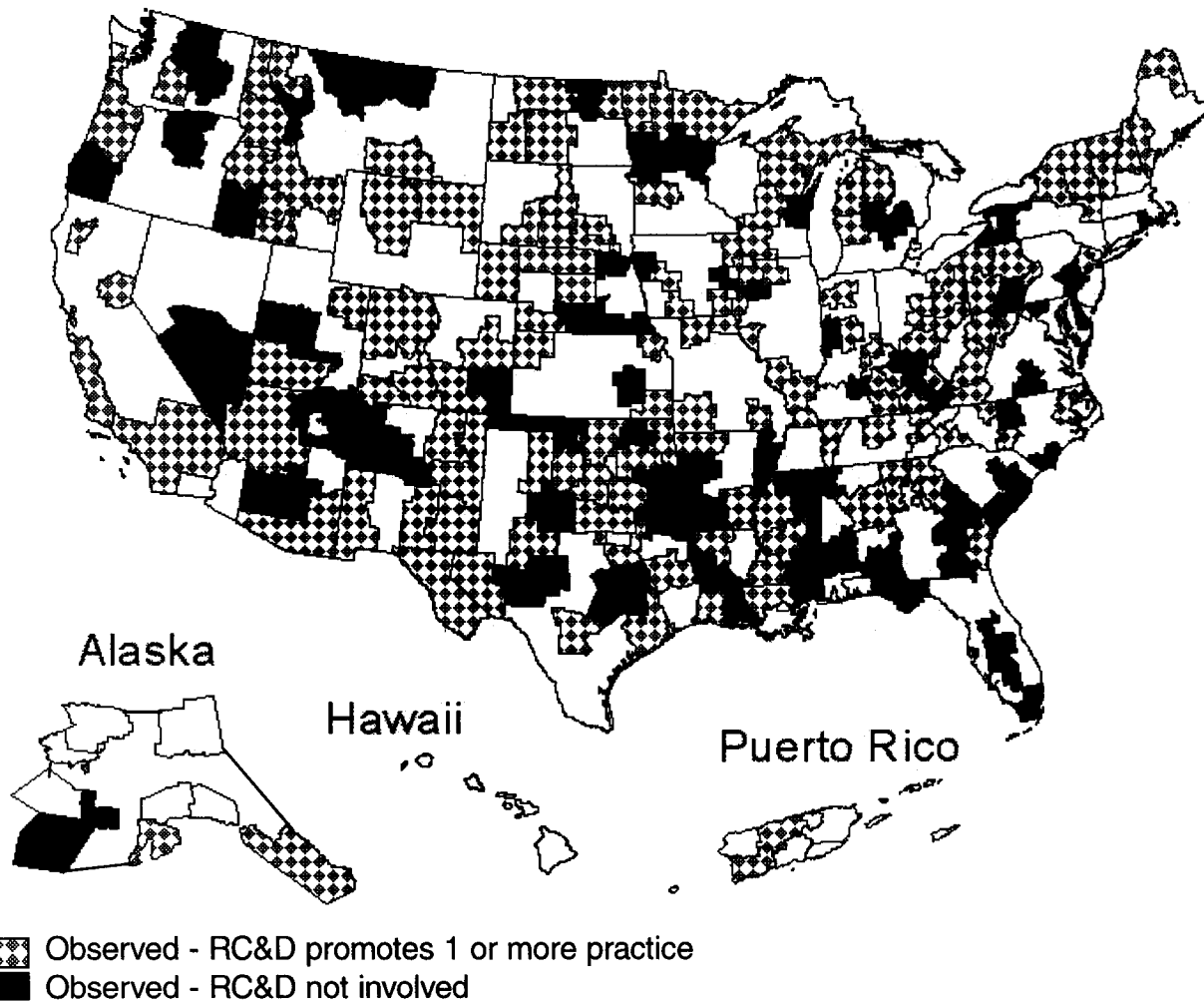


**Map 1**

Surveys were mailed to 315 RC&D coordinators. Of these, 222 returned their survey for a 71% response rate.

# Methodology

## *RC&D Areas with Agroforestry*



### **Map 2**

**There were 151 RC&D Councils that have directly promoted one or more agroforestry projects in their area. This represented two-thirds of the RC&D Councils that responded.**

of RC&D Councils. Consequently, the NARC&DC worked cooperatively with NAC to develop an agroforestry survey.

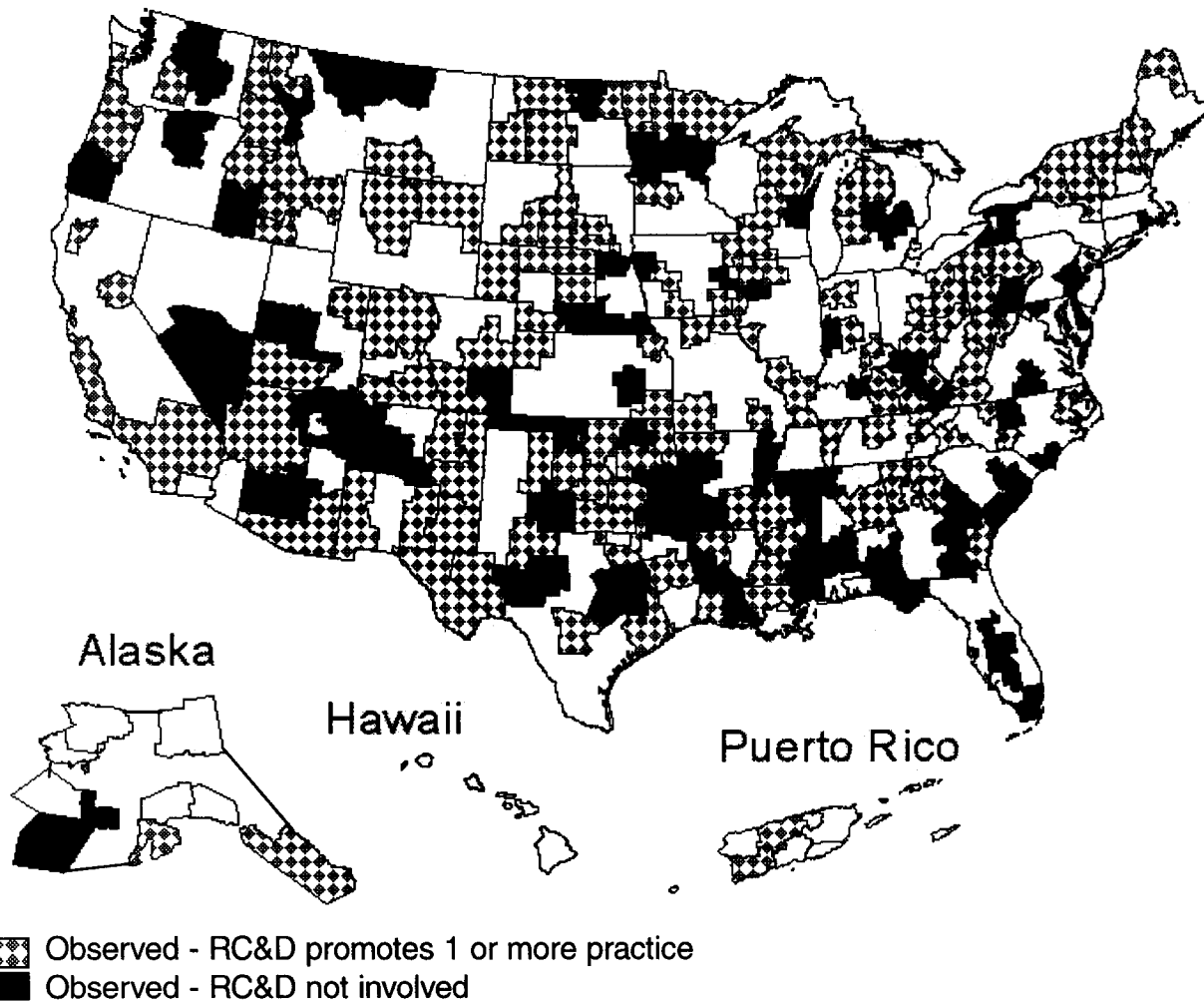
The NRCS, which supervises the RC&D coordinators, distributed the survey nationally to all 315 coordinators. The surveys were returned to NAC and the results were entered into an electronic database. The NARC&DC then analyzed this database and published this report, which is being

distributed to all RC&D Councils, interested agencies, and the public. A comprehensive presentation of the results was given at the National RC&D Conference at Ogden, Utah in June of 2000.

RC&D areas cover most of the United States (Map 1). The white areas are the only areas that do not have a formally recognized council. There were 222 RC&D's of a possible 315 that

# Methodology

## *RC&D Areas with Agroforestry*



### **Map 2**

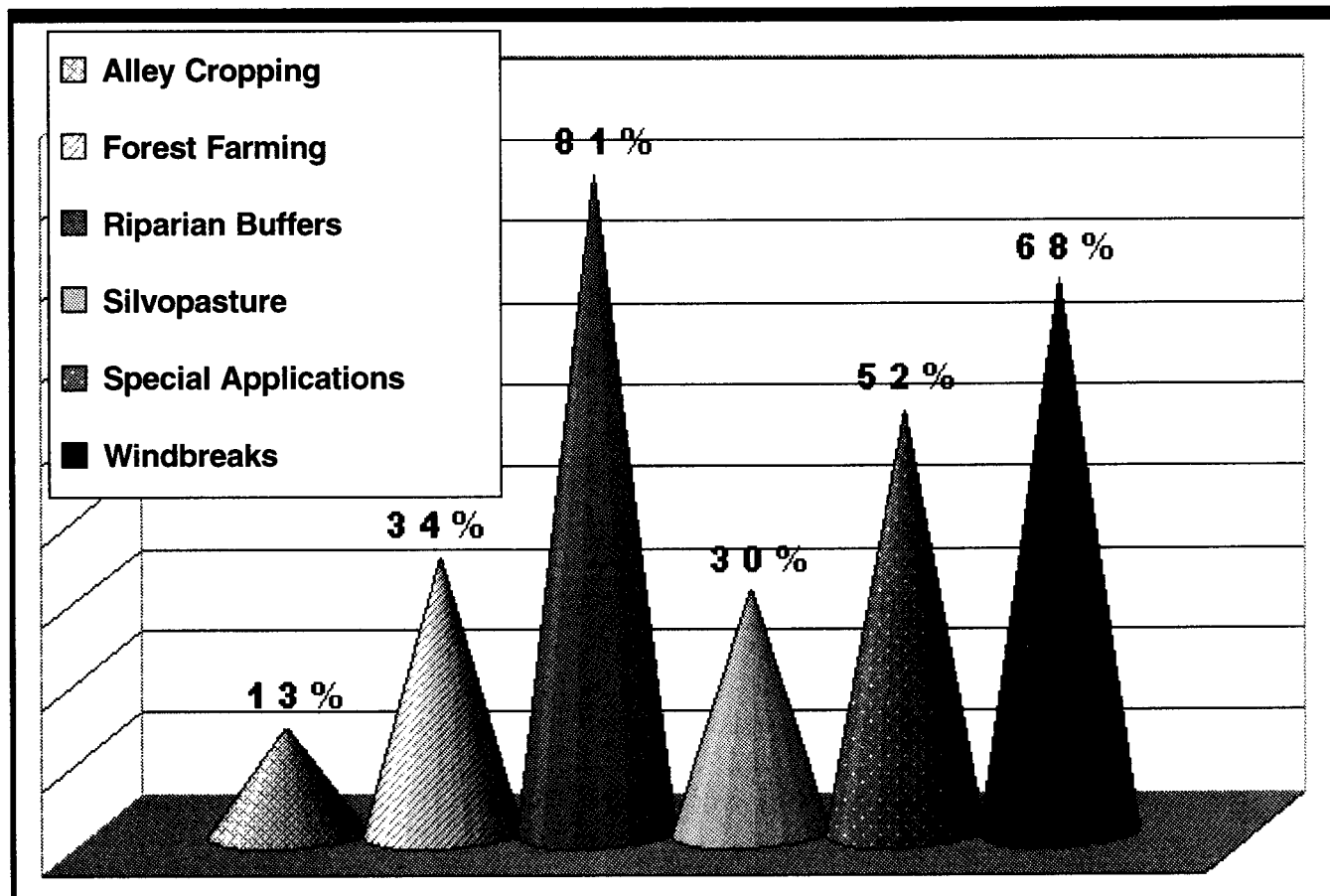
**There were 151 RC&D Councils that have directly promoted one or more agroforestry projects in their area. This represented two-thirds of the RC&D Councils that responded.**

of RC&D Councils. Consequently, the NARC&DC worked cooperatively with NAC to develop an agroforestry survey.

The NRCS, which supervises the RC&D coordinators, distributed the survey nationally to all 315 coordinators. The surveys were returned to NAC and the results were entered into an electronic database. The NARC&DC then analyzed this database and published this report, which is being

distributed to all RC&D Councils, interested agencies, and the public. A comprehensive presentation of the results was given at the National RC&D Conference at Ogden, Utah in June of 2000.

RC&D areas cover most of the United States (Map 1). The white areas are the only areas that do not have a formally recognized council. There were 222 RC&D's of a possible 315 that



*Graph 1* Frequency of agroforestry practices observed in the RC&D areas.

responded to the survey, for a return rate of 71%. The map shows that the responses are well distributed geographically. Therefore the survey should provide a good representation of national trends. Map 2 further illustrates that 67% of the RC&D's responding were directly involved with agroforestry projects.

The report is presented in six sections that follow the major groupings of agroforestry practices.

These are:

- 1) Alley Cropping,
- 2) Forest Farming,

- 3) Windbreaks,
- 4) Riparian Forest Buffers,
- 5) Silvopasture, and
- 6) Special Applications.

Graph I indicates the percentage of RC&D's that reported the occurrence of one or more agroforestry practices in their area. Each section of the report contains a map of where a practice is being applied, where an RC&D is directly involved in agroforestry, and where there was a perceived potential for greater adoption of an agroforestry practice.



# Sources of Assistance

There are several sources of assistance available to those that want to carry out agroforestry practices on their land. Some of these are listed below for your benefit. You may be able to find leads to others on these organizations home pages.

**National Association of RC&D Councils**

444 North Capitol Street  
Suite # 345  
Washington, DC 20001

[www.rcdnet.org](http://www.rcdnet.org)

**USDA National Agroforestry Center**

East Campus-UNL  
Lincoln, NE 68583-0822

[www.unl.edu/nac](http://www.unl.edu/nac)

**USDA Natural Resources Conservation Service**

14th and Independence Ave.  
Washington, DC 20250

[www.nrcs.usda.gov](http://www.nrcs.usda.gov)

**USDA Forest Service**

P.O Box 96090  
Washington, DC 20090-6090

[www.fs.fed.us](http://www.fs.fed.us)

**USDA Cooperative State Research, Education & Extension Service**

Room 3328 South  
1400 Independence Ave SW  
Washington, DC 20250-0900

[www.reeusda.gov](http://www.reeusda.gov)

**National Association of Conservation Districts**

509 Capitol Court, NE  
Washington, DC 20002-4946

[www.nacdnet.org](http://www.nacdnet.org)

**National Association of State Foresters**

444 North Capitol Street, NW  
Suite 540  
Washington, DC 20001

[www.stateforesters.org](http://www.stateforesters.org)

**USDA Sustainable Agriculture Research and Education (SARE)**

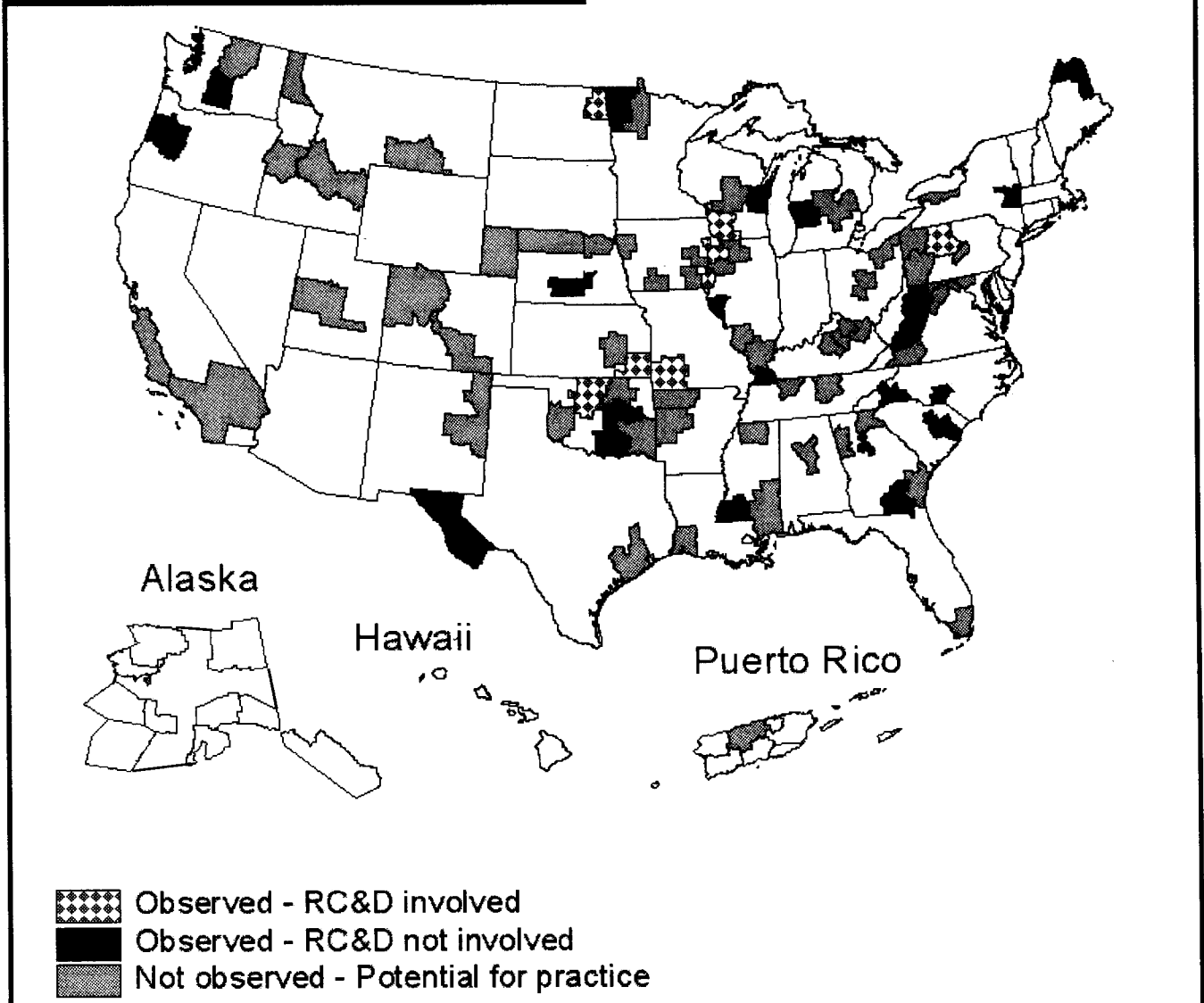
ATTRA  
10301 Baltimore Ave.  
Beltsville, MN 20705-2351

[www.sare.org](http://www.sare.org)

# Alley Cropping

*Alley cropping is the growing of an annual or perennial crop between rows of high value trees. The agricultural crop generates annual income while the longer-term tree crop matures. Examples include growing soybeans between rows of black walnut trees or hay between rows of fast growing pine or poplar. The type of annual crop grown varies as the trees grow larger and produce more shade.*

## Alley Cropping



**Map 3**

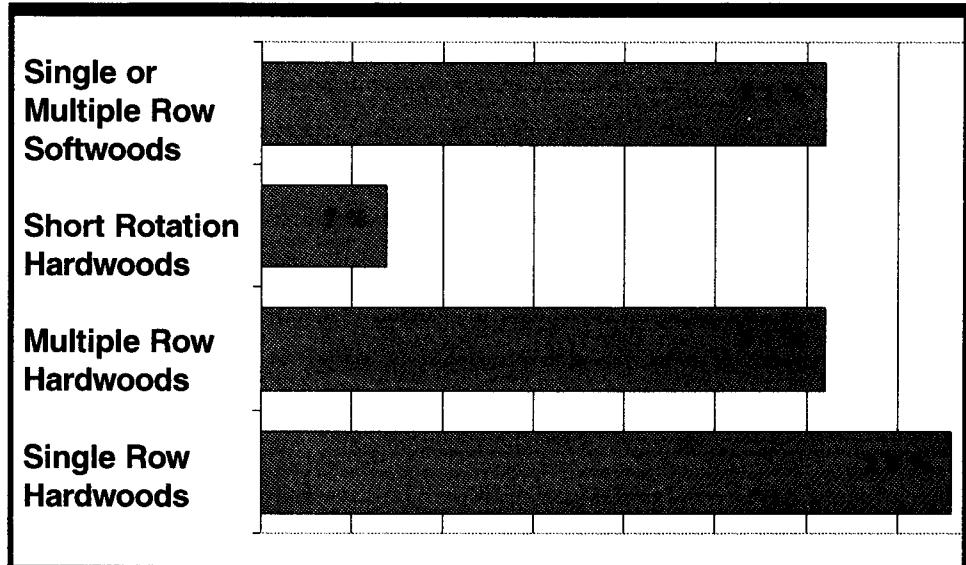
Alley cropping was observed in 13% of the RC&D areas and 8 RC&D Councils were directly involved in projects.

# Alley Cropping

Thirteen percent of the RC&D's (from 22 states) responded that alley cropping is utilized in their areas (Map 3). Many RC&D's indicated there was a potential for expanding the use of this practice.

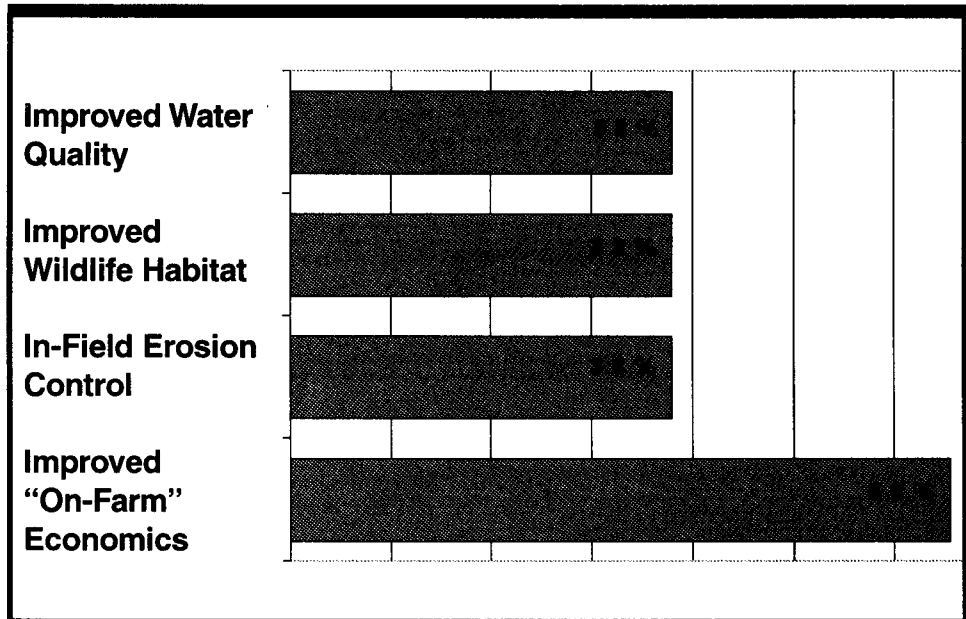
Single and multiple-row hardwoods are most frequently used for alley cropping, but there are also locations that use single or multiple-row softwoods. Alley cropping is generally found in the eastern half of the country with three exceptions: Oregon, Washington, and Texas. Minnesota and Kentucky reported the use of short rotation hardwood species, such as hybrid poplar, in alley cropping systems (Graph II).

Improving farm economics was the motivating issue in 66% of the RC&D areas reporting alley cropping. Field erosion control, improving water quality and improving wildlife habitat were addressed in less than one half of the areas. Additional reasons for using alley cropping included conversion of cropland



*Graph II*

Frequency that each type of alley cropping was observed in the 29 RC&D areas reporting the practice.



*Graph III*

Alley cropping addresses a variety of issues in the 29 RC&D areas. This graph shows the reported frequency of issues motivating the use of alley cropping.

to trees, improved crop yields, establishing orchards, and revegetating coal-mined areas (Graph III).

## Alley Cropping

**Hybrid Hazelnuts** - The Limestone Bluffs RC&D in Iowa started a demonstration project in 1995 to evaluate hybrid hazelnuts as a potential commercial crop. One of the larger demonstrations was established on the Gary Petersen farm near Maquoketa in Jackson County, Iowa. Hazelnuts were obtained from Badgerset Research Farm in southeast Minnesota, which is developing hazelnut cultivars for commercial scale production. The site selected for the demonstration involved a contour buffer strip system within a cropped field. The buffer strip is a permanently vegetated strip 22 feet wide used for erosion control. The purpose of the demonstration is to gather information on production practices, hybrid varieties, and economic benefits of growing hazelnuts as a potential cash crop.

The hazelnuts were established in a single-row approximately 3 feet from the down hill edge of the existing buffer strip system. The remainder of the buffer strip is a mix of alfalfa and grasses that can be harvested for hay. Small grains and no-till corn are being planted in the crop strips between the buffers. The hazelnuts were planted approximately 7 feet apart as tublings (a seedling raised in a tube in a greenhouse environment.)

The demonstration has been inspected periodically through the growing season to check on progress, watch for diseases, weeds, or pest problems. Weed control has been provided mechanically with a rototiller or cultivator or with some labeled herbicides. The Petersen site has resulted in the establishment of a stand of hybrid hazelnuts. However, some lessons have been learned. Significant damage occurred from deer browsing, limiting commercial scale nut production up to this point. Other pest problems have involved rabbits and mice. The site has also experienced some damage from herbicide drift from the corn strips.

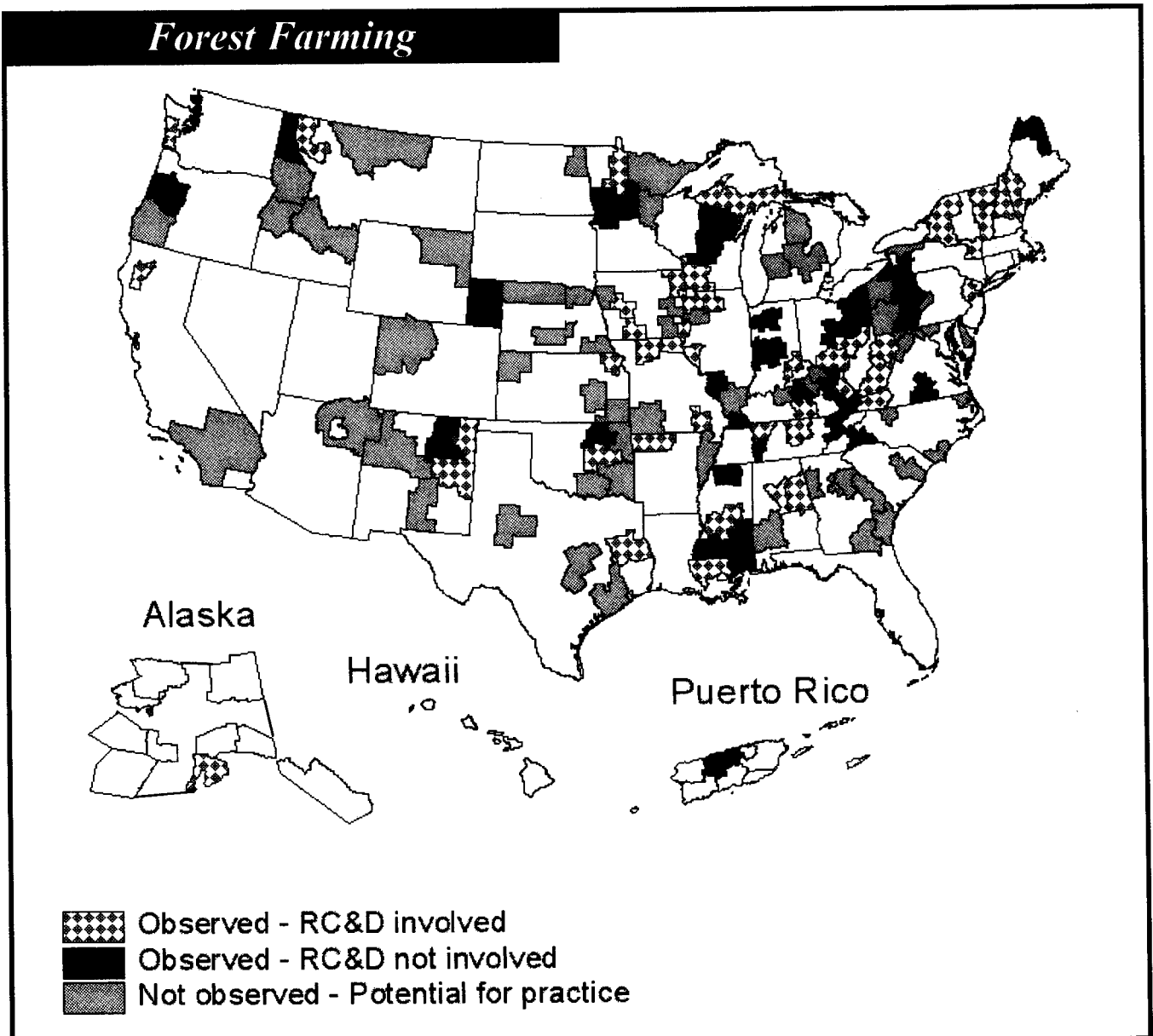
For hazelnuts to be successful in a buffer strip system, strategies to minimize deer damage in the initial years should be considered. Hybrid hazelnuts can produce a nut crop in as little as three to five years.

- *Limestone Bluffs RC&D, Maquoketa, Iowa*

- Of the RC&D's with alley cropping, 69% see potential for expanding the practice. RC&D's promoted alley cropping in only 28% of the areas reporting the practice (Map 3). Comments indicated there was a lack of knowledge on how to make the best use of the practice. Many comments were related to the need to demonstrate favorable economic returns to increase farmer interest.
- Alley cropping systems were reported to include the following: conventional row crops, commodity crops, herbs and medicinals, and hay and forage.
- Eight of the RC&D's have promoted alley cropping. Two used seminars and conferences, while others were involved with helping to grow herbs and medicinals, planting hazelnuts in contour strips, and cropping between rows of black walnut.

# Forest Farming

*Forest farming is the cultivation of high-value specialty crops under a forest canopy that has been modified to provide the correct shade and microenvironment for the crop. These specialty crops usually fall into three categories: medicinal, culinary, or ornamental.*

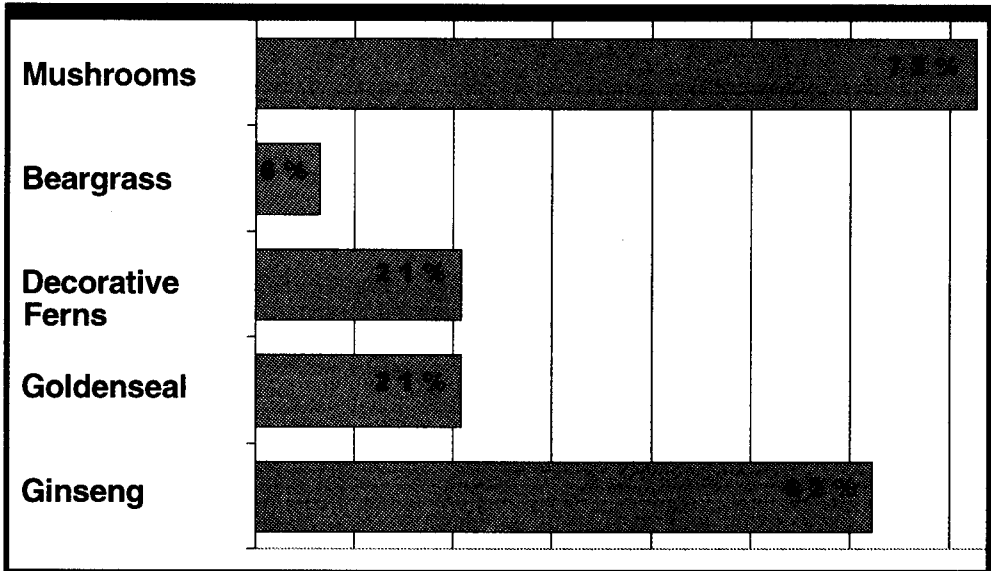


**Map 4**

Forest farming was observed in 34% of RC&D areas and 44 RC&D Councils were directly involved in projects.

# Forest Farming

■ Thirty-four percent of the RC&D's (from 34 states) reported forest farming practices in their areas, with the Midwest and Southeast encompassing 70% of the activity (Map 4). Some areas had more than one type of forest farming crop, however only one, Trinity RC&D in California, had all five types listed in the survey. The survey asked about five types of forest farming crops including: mushrooms, decorative ferns, ginseng, goldenseal, and bear grass. Graph IV shows the frequency of each type. Mushrooms and ginseng are the most frequently grown and many RC&D's are directly involved (Maps 5 and 6).



**Graph IV** Frequency that each type of forest farming occurs in the 77 RC&D areas reporting the practice.

■ The distribution of types depends on the necessary conditions for the specific specialty product. For example, beargrass was reported in only 5 RC&D's in 5 states. Due to its special environmental needs, it is found primarily in the Pacific Northwest.

## Forest Farming

**Shiitake Mushrooms** - In the early 1990's AlaTom RC&D Council was looking at mushroom production as a way to develop alternative income for rural residents, to further diversify rural farm economy and to provide a value added commodity with a low capital investment on an under utilized wood product.

A small grant from the US Forest Service was provided to test some different strains of mushrooms under different conditions. The Ala-Tom RC&D Council in western Alabama decided to do a few "show-n-tell" workshops and to follow-up with the producers. Shiitake mushrooms were grown under a pine canopy in a wide variety of settings.

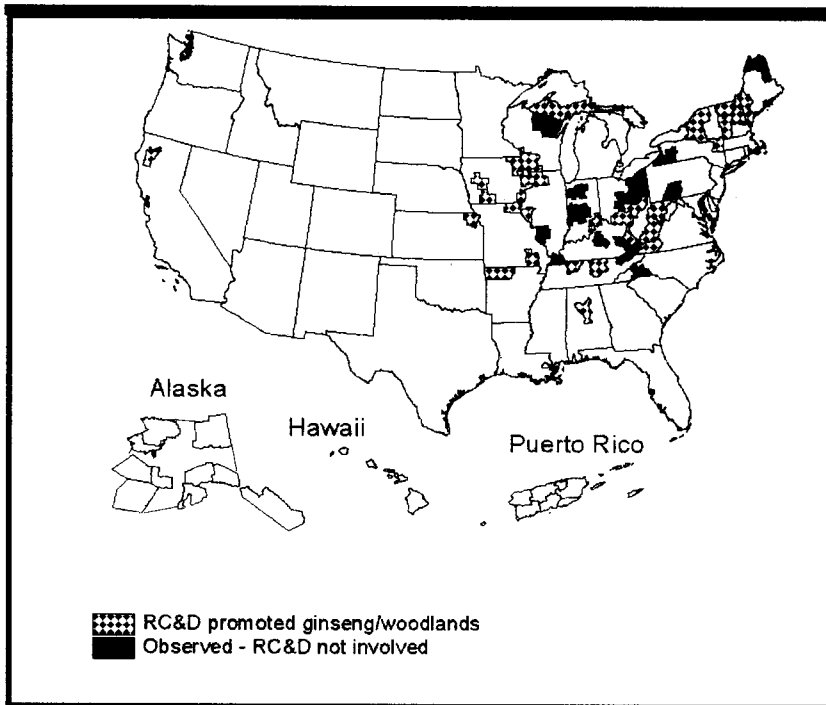
The mushrooms not only grew well in Alabama, but word of mouth spread the idea so fast that demonstrations were put in nearly every county in the state within a few years. RC&D Councils individually and in concert with the statewide association conducted training demonstrations with volunteer labor and with cooperation from partners at the Soil and Water Conservation District and the extension system at Alabama

A&M and Auburn University. A statewide Shiitake Producers Association (SPA) was formed as a nonprofit corporation. Grower members share stories and techniques, pool product, and share purchases. Tools were adapted to simplify the inoculation process. Some growers built fruiting sheds in an attempt to develop a year round enterprise.

The biggest hurdle was to develop and supply high income, steady outlets for the mushrooms. A few very large [over 1,000 fruiting logs] producers have been able to recruit, service and retain steady markets. Niche marketers, selling to gourmet restaurants or to local mushroom lovers have also been able to stay in business and to make a small but steady profit. Some of the early "believers" expected high profits and easy markets based on early successes. Few were prepared for the steady manual labor demands of outdoor mushroom production, for the vagaries of the weather and inconsistent markets. Those that did plan for these circumstances or were able to flex up and down with a seasonal market have continued production.

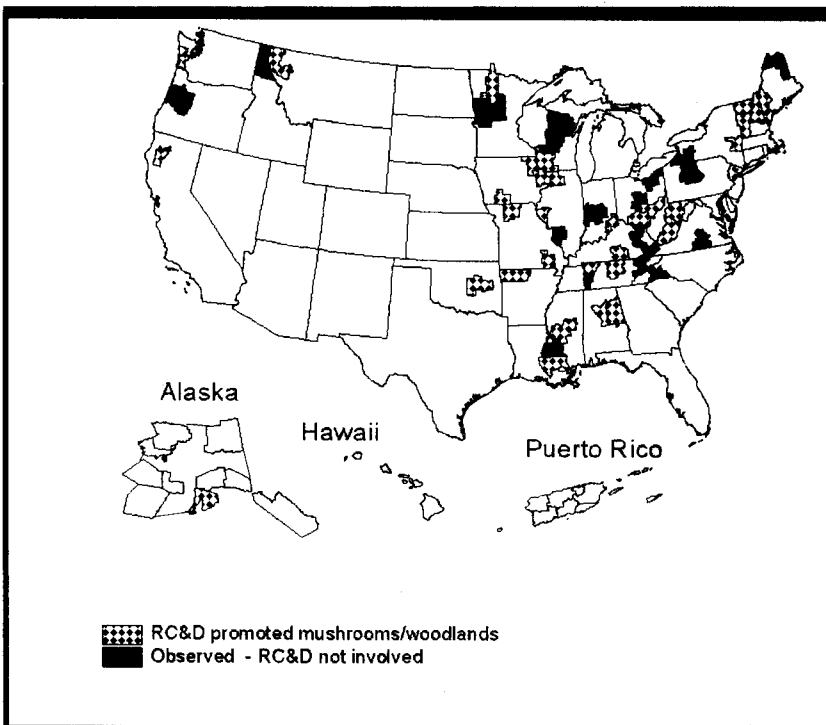
- Ala-Tom RC&D Council, Grove Hill, Alabama

# Forest Farming



Map 5

Ginseng is grown in 62% of the 77 RC&D areas that reported forest farming.



Map 6

Mushrooms are grown in 72% of the 77 RC&D areas that reported forest farming.

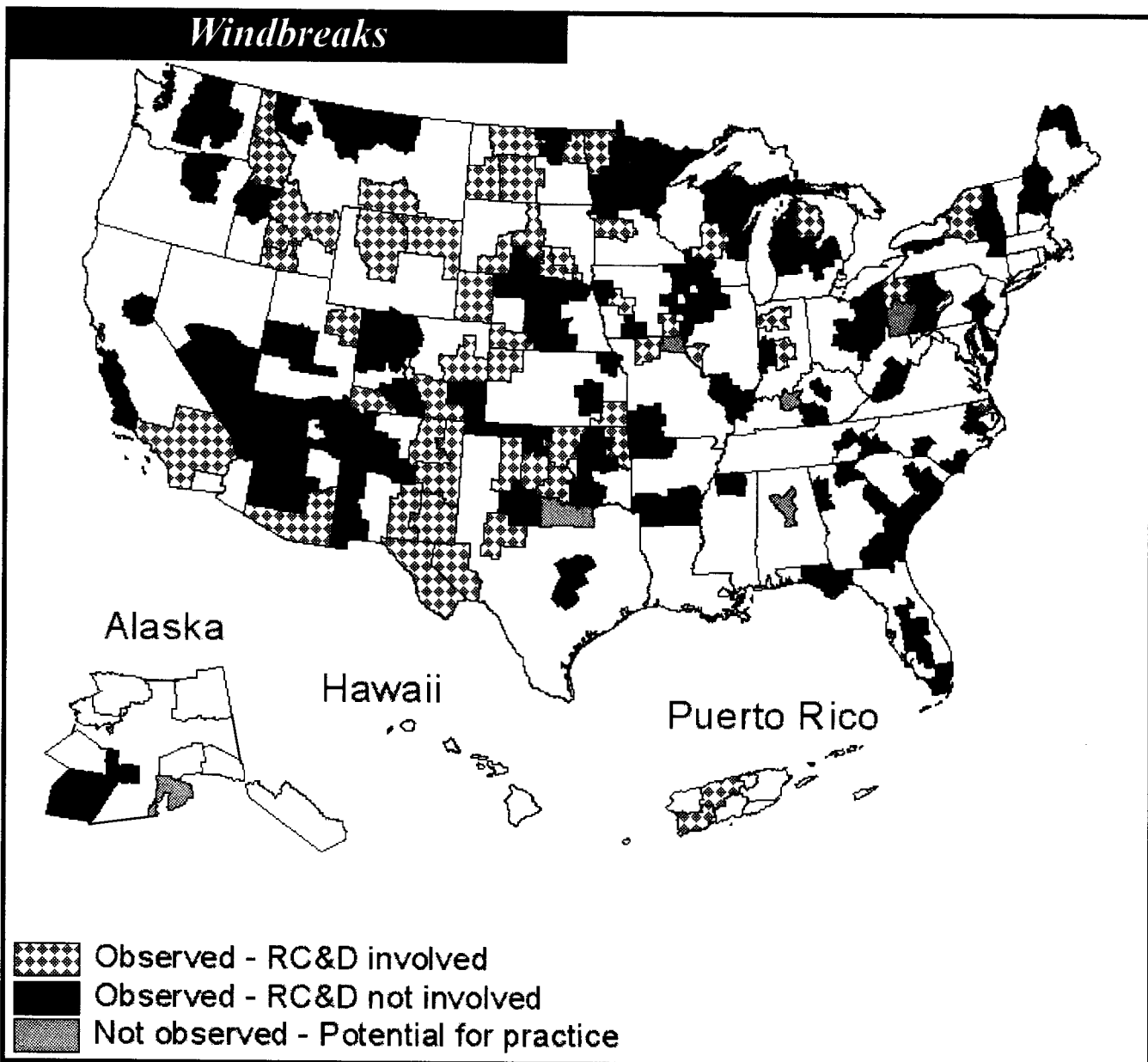
■ Of the RC&D's that reported forest farming, 92% indicated they believe there is an opportunity for expansion. Many RC&D's (57%) reporting forest farming are directly promoting the practice, with 21 areas promoting it through seminars, conferences, tours, and demonstrations. Three have helped develop organizations such as cooperatives and associations to help market products.

■ A number of additional crops were identified as potential products. They were medicinals, wild flowers, nuts such as acorns and hazelnuts, grapevines for crafts, pine straw mulch, kenaf, maple syrup, wild blackberries, raspberries, and European truffles. Five RC&D's specifically mentioned the need for more information and education on forest farming, while one noted the need for additional research.

■ The application of forest farming has the most varied opportunities, but a need for market development was identified by 10% of the RC&D's. Profits will be necessary to encourage further adoption of forest farming. RC&D areas in three states indicated that small farms and acreages were especially conducive to forest farming.

# Windbreaks

*Windbreaks are planted to prevent soil erosion and to protect crops, livestock, buildings, work areas, roads, or communities from wind or snow. Living snowfences primarily protect roads but can also harvest snow to replenish soil moisture or fill ponds and reservoirs. There are four basic types of windbreaks: farmstead/community, field, livestock, and living snowfences.*



**Map 7**

Windbreaks were observed in 68% of the RC&D areas and 65 RC&D councils were directly involved in projects.

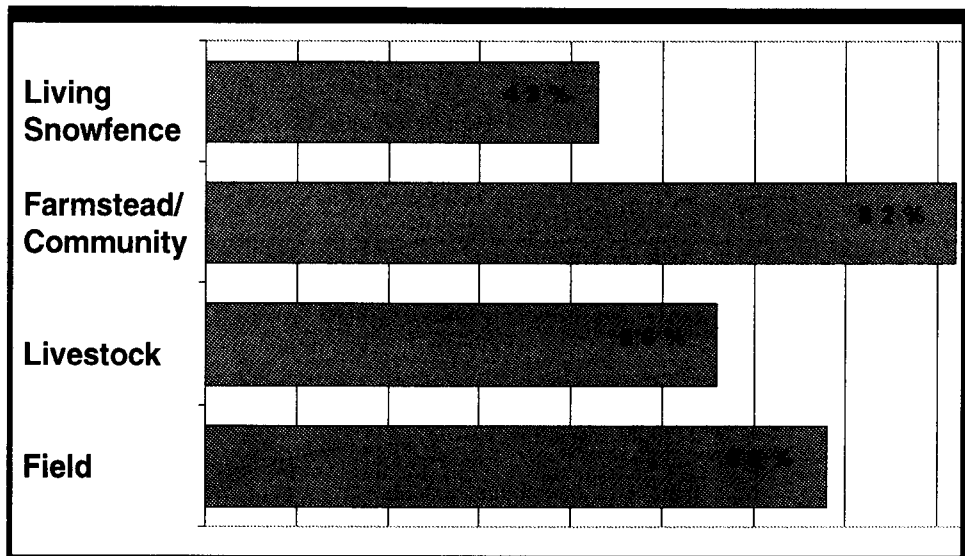


# Windbreaks

■ Windbreaks have been encouraged and used for many decades. This is reflected by 68% of the RC&D areas reporting the practice in forty-three states.

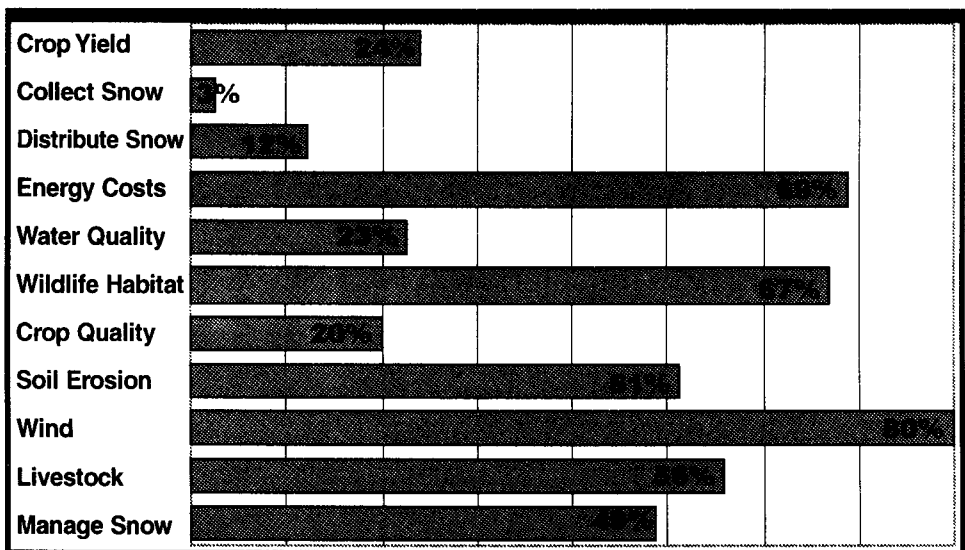
■ Of the RC&D's reporting windbreaks, 82% have farmstead/community windbreaks. The improved living conditions, particularly in the winter, make them popular. Field windbreaks are present in 68% of those reporting windbreaks and livestock windbreaks were observed by 56% (Graph V). Several RC&D's not reporting the use of windbreaks indicated there was potential (Map 7).

■ The issues most often addressed by windbreaks are reducing wind velocity, lowering energy costs, habitat for wildlife, livestock protection, and reducing soil erosion (Graph VI). The availability of cost share programs has increased the adoption of some windbreak practices. Many responses emphasized the importance of working with partners, such as Soil and Water Conservation



*Graph V*

Frequency that each type of windbreak occurring in the 164 RC&D areas reporting the practice.



*Graph VI*

Windbreaks in the 164 RC&D areas were used to address several issues. This graph shows the reported frequency of issues motivating the use of windbreaks.

Districts (SWCD's), NRCS, university extension and other state and federal agencies. RC&D's have helped to promote and organize programs to accelerate the planting of windbreaks.

## Windbreaks

**Community Windbreaks** - Prairie Country RC&D covers a nine county area in West Central Minnesota. The RC&D Council has been involved in promoting community windbreaks since 1992. At that time, the Council set a goal of establishing one windbreak in each of their nine counties. Since then, the Council has conducted workshops and informational meetings and developed brochures on the benefits of community windbreaks and resources available to establish them. To date, Prairie Country has assisted eight communities in obtaining funding to establish windbreaks.

The main goal of the project was to demonstrate to rural communities how a properly designed, multi-row windbreak could provide them with multiple benefits. The project also gave community members, including youth and other volunteers, an opportunity to work together to enhance the local environment and foster community spirit and pride.

The windbreaks provided the following benefits:

- Reduced wind and blowing snow (by up to 85%)
- Reduced home heating cost (by 15 to 25%)
- Wildlife habitat
- Reduced soil erosion by wind
- Recreation and education benefits
- Increased aesthetic appeal of towns
- Substantially sequestered carbon

Prairie Country obtained most of the funding to establish the windbreaks through the Minnesota ReLeaf Program, which provided approximately 75% of the cost. In-kind and cash contributions from local communities, soil and water conservation districts (SWCD's), and other partners covered the remaining costs. Also, due to the severe winter of 1996-97, the Federal Emergency Management Agency (FEMA) provided some additional funding for community windbreak projects to help alleviate snow problems that continue to plague many rural communities.

About 25 rural communities in the Prairie Country RC&D area still needs funding for the establishment of a community windbreak, so the Council continues to seek additional funding. Land acquisition has been the biggest obstacle for most rural communities in windbreak establishment.

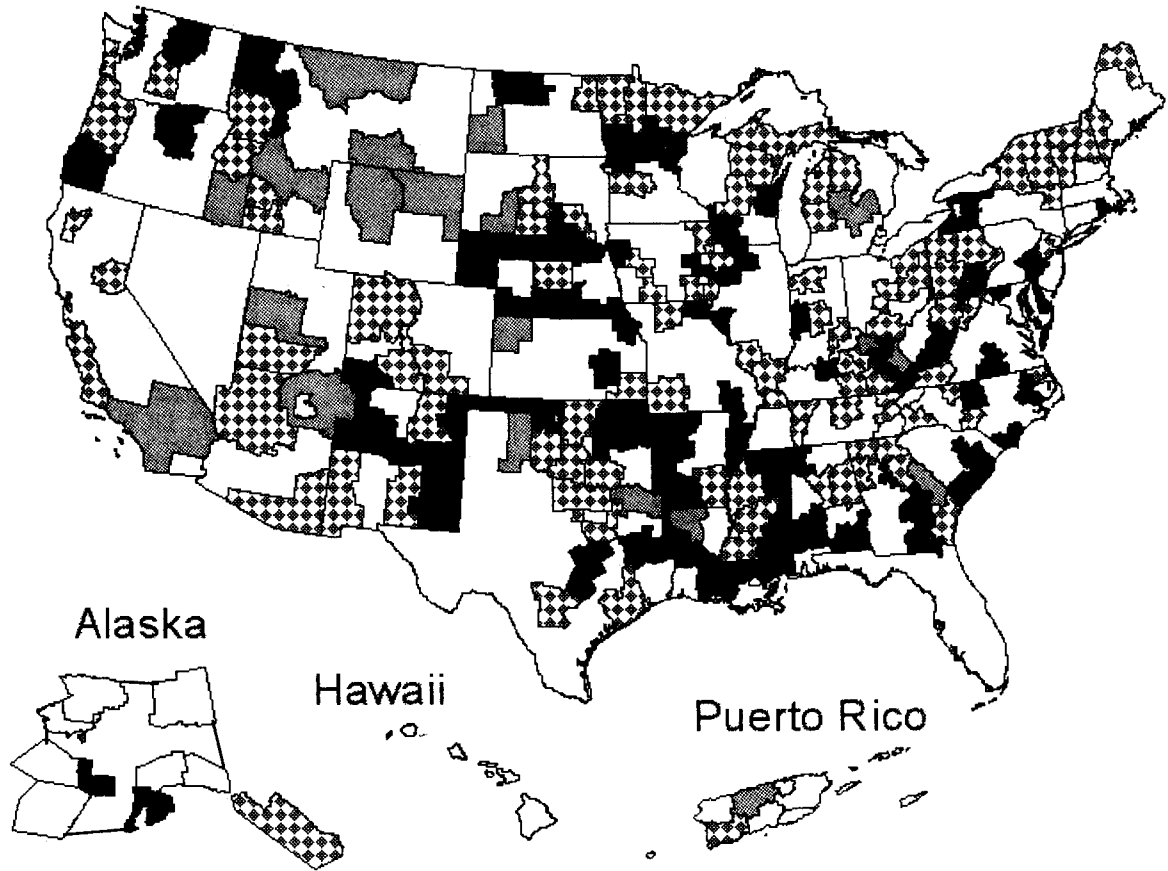
- *Prairie Country RC&D, Willmar, Minnesota*

- Several opportunities for expanded use of windbreaks were mentioned. Living snowfences are needed on more roadways, including the interstates. One RC&D area referred to a need for "windshed" treatment rather than scattered windbreaks. The interface between agriculture and communities was considered an area needing greater application.
- Windbreaks have been planted in many areas since the 1930's and many have reached maturity. A number of RC&D areas pointed out that many trees are deteriorating and dying. Also, many windbreaks have been removed due to changes in farm machinery and the adoption of center pivot irrigation. The high cost of establishing windbreaks may limit new plantings. Several comments referred to the need for funding programs to encourage renovating windbreaks or planting new ones.

# Riparian Forest Buffers

*Riparian Forest Buffers are natural or planted streamside woodlands comprised of trees, shrubs, and grasses. They are designed to buffer non-point source pollution, such as excess nutrient and pesticide runoff, generated from adjacent land use. Riparian forest buffers also reduce stream bank erosion, enhance aquatic environments, augment wildlife habitat, and provide aesthetic value.*

## Riparian Forest Buffers



- Observed - RC&D involved
- Observed - RC&D not involved
- Not observed - Potential for practice

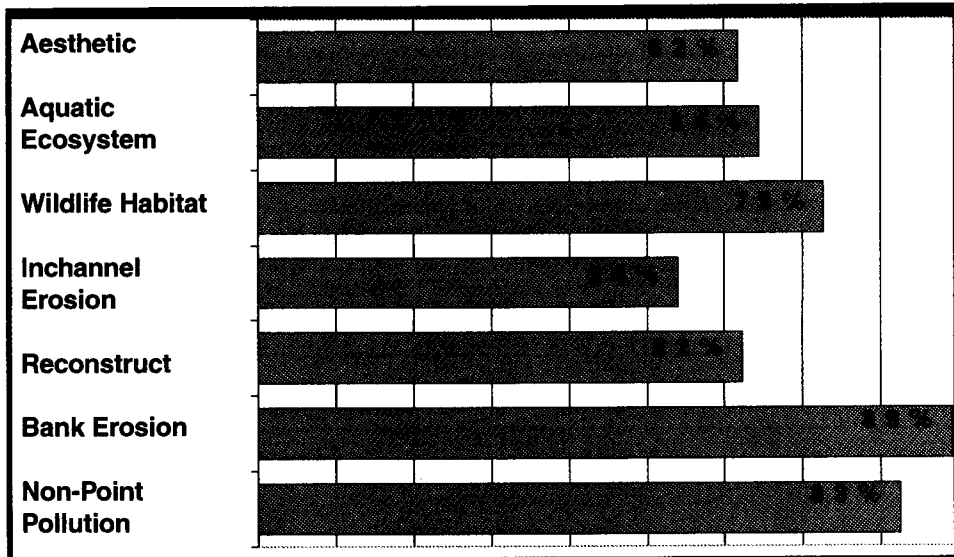
### Map 8

Riparian forest buffers were observed in 81% of the RC&D areas and 104 RC&D Councils were directly involved in projects.

# Riparian Forest Buffers

Riparian forest buffers are the most frequently used of the agroforestry practices, with 81% of the RC&D's reporting the practice. Opportunities for installing additional buffers are recognized in 93% of the RC&D areas (Map 8). Approximately the same number of forested riparian buffers were planted as were the result of maintaining naturally occurring vegetation. These buffers are used to address more than one issue at a time, with the dominant intent (89%) being to control streambank erosion, followed by controlling non-point source pollution at 83%, and enhancing wildlife

habitat at 73% (Graph VII). In addition, restoration, in-channel erosion, aquatic habitat, and aesthetics were all addressed more than 50% of the time.



**Graph VII** Riparian forest buffers used in the 182 RC&D areas addressed several issues. This graph shows the frequency of each issue reported.

## Riparian Forest Buffers

**Conasauga River** - The Conasauga River Alliance is a coalition of local citizens, businesses, conservation groups, and government agencies who are working together to "maintain a clean and beautiful Conasauga River - forever." The Alliance was organized with the support of the Limestone Valley RC&D Council, and its members include farmers, school teachers, leaders of the forest products industry, conservation groups like The Nature Conservancy and the Tennessee Aquarium, and over a dozen state and federal agencies, including the Georgia Department of Natural Resources, the U.S. Forest Service, and the U.S. Fish and Wildlife Service.

Located in southeastern Tennessee and northwestern Georgia, the Conasauga River watershed includes 500,000 acres and 125,000 people. The river and its tributaries provide water for the dyeing process for two thirds of the nation's carpet production, drinking water for local families, water for crops and livestock, swimming and boating opportunities, and habitat for 90 species of fish and 25 species of freshwater mussels. The Conasauga River Alliance has led or assisted with more than a dozen projects to maintain or improve more than 20

miles of riverside and streamside buffers. These projects have included land uses ranging from cropland and pasture to power lines and recreation areas at a historic mill, and two National Forest campgrounds. Examples of these efforts include: tree planting and fencing to re-establish a buffer along critical habitat for the blue shiner, while installing a well and watering troughs to provide access for both humans and their horses on U.S. Forest Service land; a streambank stabilization project that demonstrates several different techniques to restore and protect eroding streambank areas and to re-establish a healthy streamside buffer; over 15 miles of buffers through the Conservation Reserve Program; and 1.5 miles of grassed buffer added to existing forest buffer on riverfront cropland. Each project brought together different partners, ranging from the Natural Resources Conservation Service and the Farm Service Agency to the National Fish and Wildlife Foundation, the Tennessee Valley Authority and of course local landowners.

- Limestone Valley RC&D, Jasper, Georgia

# Riparian Forest Buffers

- A variety of opportunities for expanding the use of forested riparian buffers were listed. Most issues related to water quality. The additional uses point out that there are many and varied benefits. This makes designing buffers more complicated, but also can lead to greater adoption.
- While 19 comments pointed out how land owner assistance programs can help implement this practice, some limitations were addressed. Several noted that many of the riparian land areas are too small to warrant participation in existing programs. A need for more information and education on how to apply the practice and explain the benefits to society was identified.
- The impact of grazing on riparian areas surfaced as a common concern across the country. More information is needed in New Mexico about the impacts of grazing at various times of the year. A New York RC&D stated that an expanded Grazing Lands Conservation Initiative program would help the situation.
- Several comments stood out. It was noted that planting riparian forest buffers was a low cost solution to controlling streambank erosion. The arid Southwest could benefit by eliminating salt cedar trees and replacing them with native species, such as cottonwoods and black willow. Using poplar on marginal irrigated land could provide an alternate cash crop and protect the flood plain, but wood markets will need to be developed to achieve any large-scale planting. Of the 106 RC&D's involved in projects, most work in partnership with the usual partners such as SWCD's, NRCS, Forest Service, and Environmental Protection Agency (EPA). They are also working with watershed organizations, The Nature Conservancy, and Future Farmers of America chapters.



# Silvopasture Systems

This practice is increasingly being applied to pine stands, such as loblolly pine/bahia-grass or ponderosa pine/native grass. To date, there has been little research to justify grazing within hardwood stands, with a notable exception being the successful grazing of pecan orchard/fescue grass systems.

- Thirty percent (67 RC&Ds in 32 states) of those replying to the survey reported silvopasture being used in their area (Map 9).

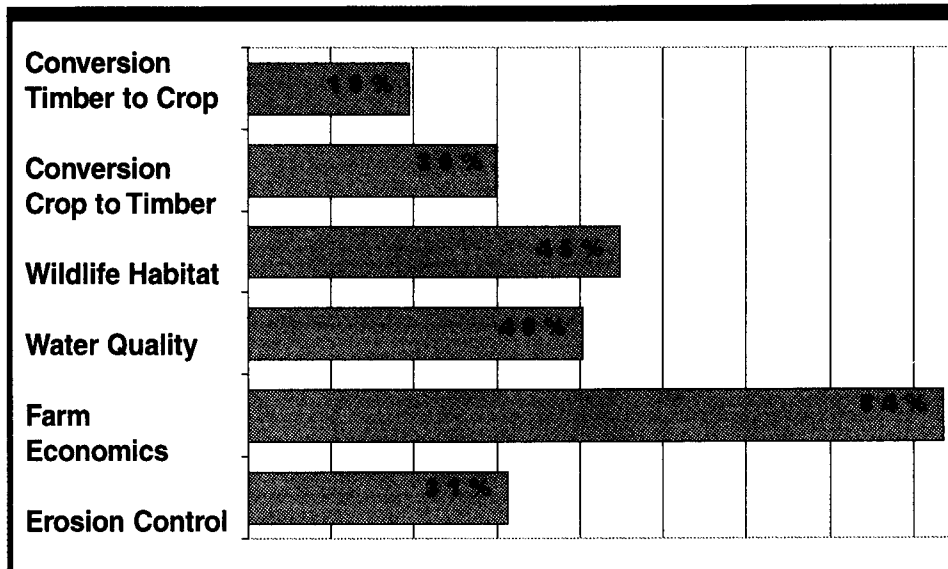
About 60% of the areas using this practice occur in the Southeast.

- Improved farm economics was the perceived motivation for trying silvopasture in 84% of the areas. Many of the RC&D areas indicate that the desire for economic diversification is an important issue that will increase interest in silvopasture opportunities. Other issues that were addressed to a lesser extent by silvopasture included erosion control, water quality, and wildlife habitat (Graph VIII).

- Alaska indicates that the dairy and livestock industries are growing, resulting in more grazing of the native forests.

- Establishment of pecan orchards seems to provide an incentive in several areas.

- In some locations a high-density of pinion-



**Graph VIII** Silvopasture systems used in 67 RC&D areas addressed several issues. This graph shows the frequency of each issue reported.

juniper and cedar create problems with grazing and technical assistance is needed.

- Silvopasture practices are being promoted by RC&D's using tours, meetings, brochures and grazing trials. One RC&D area holds an annual forestry awareness week for youth, while another helps with grant writing to encourage the practice.

# Silvopasture Systems

## Silvopasture

The Sam Houston RC&D is helping landowners who have pine forests to transition into silvopasture systems. The Range Consultant/Planner of the Sam Houston RC&D in Alvin, Texas serves as a "grazing doctor." A landowner comes in with a problem, questions, or goals; after careful evaluation, a specific prescription for his or her situation is developed. Prescriptions may include: fencing, tree thinning, tree and grass planting, grazing, burning, and developing watering areas for livestock.

In the past, landowners have been reluctant to develop comprehensive management plans because they are concerned that land improvements may encourage endangered species, mostly the red cockaded woodpecker, to set up residence on their land. If this happens, management restrictions imposed by the Endangered Species Act would soon follow. Now, however, landowners can take advantage of the new Federal *Safe Harbor* Program, which will allow them to develop their

silvopasture system without the risk of incurring greater endangered species management restrictions.

The Texas Parks & Wildlife Department and the Texas Forest Service administer the *Safe Harbor* Program, while the Sam Houston RC&D provides individual assistance. These agencies establish a base line level for endangered species populations on a landowner's property. The landowner is only responsible for maintaining this population level, while still being able to apply the conservation practices in the prescribed silvopasture system. For instance, let's say the base line population of red cockaded woodpeckers is zero. If the landowner implements a prescribed silvopasture system with the RC&D, and red cockaded woodpeckers move onto the property he or she is not required to manage the land to sustain the new woodpecker population. Prior to the *Safe Harbor* Program, each landowner was responsible for maintaining all populations of endangered species detected on their property.

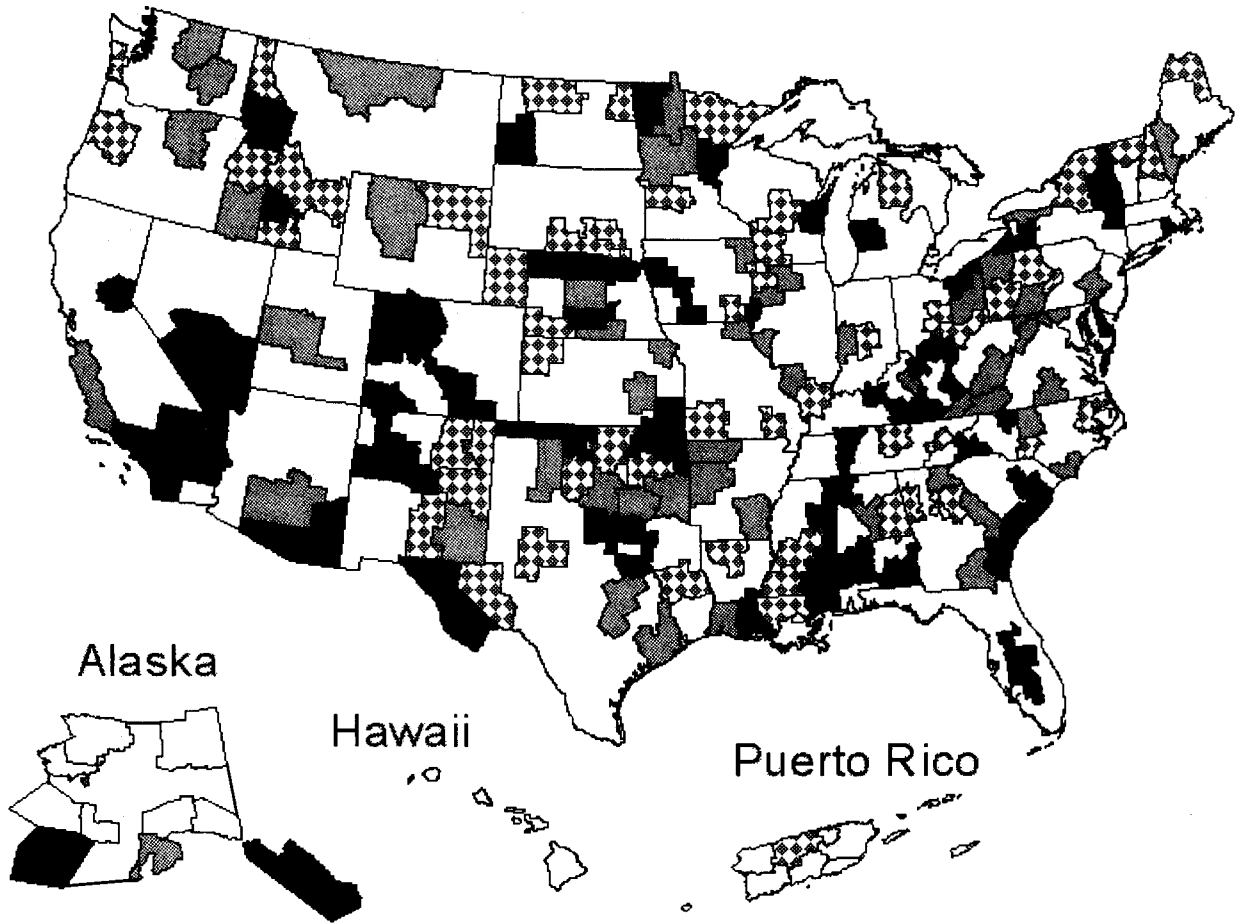
- Sam Houston RC&D, Alvin, Texas






# Special Applications

*Special applications address the many opportunities for utilizing trees and shrubs for specific agricultural or rural community concerns. These special applications include the disposal of community waste water or farm animal waste in poplar or pine wood fiber plantations, visual screening, noise abatement, and odor control.*

## Special Applications



-  Observed - RC&D involved
-  Observed - RC&D not involved
-  Not observed - Potential for practice

**Map 10**

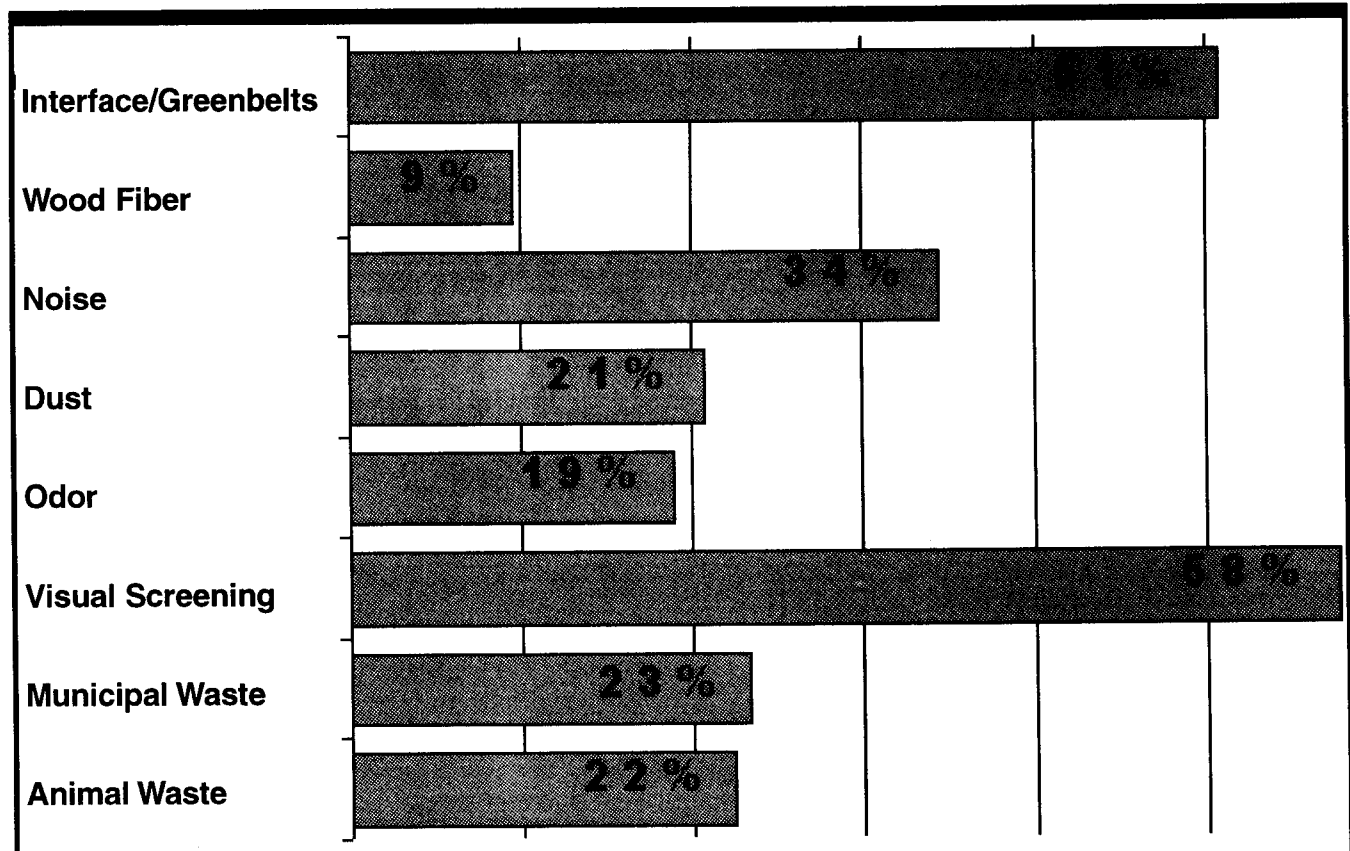
Special application practices were observed in 52% of the RC&D areas and 60 RC&D Councils were directly involved in projects.

# Special Applications

Special Applications are tailored to meet a specific need, so there is much variation between applications of the same name. The RC&D's were asked to identify which of the following eight issues were being addressed in their areas: 1) interface/greenbelts, 2) wood fiber, 3) noise, 4) dust, 5) odor, 6) visual screening, 7) municipal waste, and 8) animal waste.

- Fifty-two percent reported special agroforestry applications in their RC&D areas. This included 28 states, of which more than one-third are located in the Southeast (Map 10).
- Eighty-six percent of the RC&D's mentioned that there were more opportunities for additional special applications (Map 10).

- Visual screening of unsightly areas is the most common special application and was listed by 58% of the RC&D's in 31 states. The need for interface buffers, such as greenbelts between agricultural activities and communities was identified by 51% in 29 states. Thirty-four percent used agroforestry to control noise in 21 states. The disposal of municipal waste was cited by 23% of the RC&D's, while the disposal of animal waste was 22%. Trees were used to control dust in 21% of the RC&D areas, while application for odor control was 19%. Woody biomass production was reported in only 9% of the RC&D's and occurred in 9 states. (GRAPH IX).



**Graph IX** Special applications in the 115 RC&D areas address many issues. This graph shows the observed frequency of each special application included in the survey.

## Special Applications

**Recycling Irrigation Wastewater** - The Ki-Yak RC&D is working with several partners in Yakima County, Washington to demonstrate how trees can be used to treat irrigation wastewater.

Farm crops in the watershed are furrow irrigated and heavy applications of fertilizers and pesticides are used throughout the growing season to grow grapes, hops, and asparagus. Currently, the irrigation tailwater is collected in drainage ditches and discarded into the Yakima River. Nitrogen levels of up to 500 pounds per acre have been measured.

The project required the installation of two ponds. Before it can enter the river, wastewater is pumped from the ditch into a pond to allow sediments to settle. The water is next pumped into a second pond where it is routed through a set of filters into a spray irrigation system that services 50-acres of hybrid poplar, which were planted in the spring of 1998.

Fertilized and irrigated hybrid poplars grow rapidly and can exceed 12-inch diameters and heights of 80 feet within seven to 10 years. Numerous studies have documented the ability of hybrid poplars to absorb extremely high levels of Nitrogen and Phosphorus. The project benefits the farmer by providing low cost water and nutrients to irrigate trees that can be harvested and sold in less than 10 years. Water quality and growth of trees are being monitored to test the economic and environmental effectiveness of this approach.

- *Ki-Yak RC&D, Yakima, Washington*

- Biomass production may increase for several reasons. One RC&D wants to reduce fuel for wildfires and make a useful product. Another is working on ethanol from biomass. More than one area has an opportunity to make something useful from cedars. In some areas there is an established market for poplar and other hardwoods, but in most locations the absence of a wood market limits the planting of wood biomass crops. If carbon credit markets become available there will be increased interest in growing woody biomass.