

## Recovering from drought

# Restoring stream banks a big step

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**W**estern North Carolina was among the Southeast's hardest hit areas by drought in 2006-2007. Thanks to some forward thinking stream restoration work the rains that have somewhat alleviated the drought didn't go to waste.

Storms that preceded the drought in western North Carolina ripped out large sections of river and creek banks, leaving large areas open to soil erosion and making water management a real problem.

### Preventing erosion

Restoring native plants to stream banks is critical to preventing large-scale erosion problems and helping public and private water users, including farmers, better manage valuable water resources.

Alan Johnson, who grew up on a hilly western North Carolina farm, came to be a key piece of the water management problem in a story about as serendipitous as Mother Nature's sometime violent attacks on rivers and creeks.

Johnson worked for 21 years in a large manufacturing company, thinking that would be his career. The plant closed, leaving Johnson with a family, lots of responsibilities and few options for employment.

He went back to school and got a degree

when the project is ready for them," Johnson says.

Having the plants at the right growth stage is difficult when you have to use live stakes, so it seemed logical to Johnson to grow his own native plants, which have a better chance of survival in stream restoration plantings.

Two years ago he received an Ag Options Grant that provided funding to build a heated greenhouse, allowing him to have native plants available year-round.

The Ag Options program is financed by the Tobacco Buyout Program. About half the grants issued in the Ag Options program go to former tobacco growers, who are looking for alternative crops to grow on land previously used to grow tobacco.

### Restoration projects

Through his work with stream restoration, Johnson has introduced some native species into residential landscapes.

However, the vast majority of his native plants go into stream restoration projects.

"Typically, we work with large contractors who do major grading and clearing work needed to clean up stream banks. The contractors will go in and restore some slope to the stream bank to help prevent soil erosion and improve stream flow," he says.

For example, when Hurricane Ivan came through western North Carolina (See *Restoring*, Page 20)

He went back to school and got a degree in horticulture, thinking he would start a small landscaping business near his home in Fletcher, N.C.

As part of learning his new trade, he did some volunteer work with his local Soil Conservation District. Most of his volunteer work involved going to various farms and taking live stakes, or cuttings, from native species. From these cuttings, stream restorers would grow these hearty native plants on stretches of stream banks devastated by natural or man-made disasters.

Stream restoration is the re-establishment of the general structure, function and self-sustaining behavior of the stream system that existed prior to disturbance.

Restoration includes the removal of the watershed disturbances that cause instability of the stream. The next phase includes; installation of structures and planting of vegetation to protect stream banks and provide habitat.

## **Ultimate goal**

The ultimate goal of restoration is reshaping or replacement of unstable streams into appropriately functional streams that have sufficient water movement to prevent sedimentation of the stream bed and to prevent soil erosion.

Johnson quickly learned that replacing native vegetation isn't as simple as sticking a plant in the ground along a stream bank. In many ways it's akin to human organ transplants. Somehow, the native specie, like the body part, has to adapt to its new surroundings.

"I started out in a small way in stream restoration by planting some of the native species I collected on my own land. I found early on that a problem in getting these native species to grow in restoration projects is to have them ready to plant

# Restoring stream banks helps drought recovery

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a few years back it did a huge amount of damage to the rivers and creeks that criss-cross that area of the state. Big trees were blown over, taking out huge chunks of soil. "Engineers came in and created a new stream bank, then we came in and planted native species to keep the bank in place," Johnson adds.

"We will usually plant from the water line up 12-15 feet, up to the top of the bank. When the hurricanes came through back in 2006, I worked in five counties, mostly on state and federal government restoration projects," he says.

It is important, he says, to have a wide variety of native plants. For both esthetic and production reasons you don't want to have a monoculture. Though these native plants are hearty — the reason they have remained along streams for thousands of years — there is always a risk of some disease or insect taking them out, Johnson says.

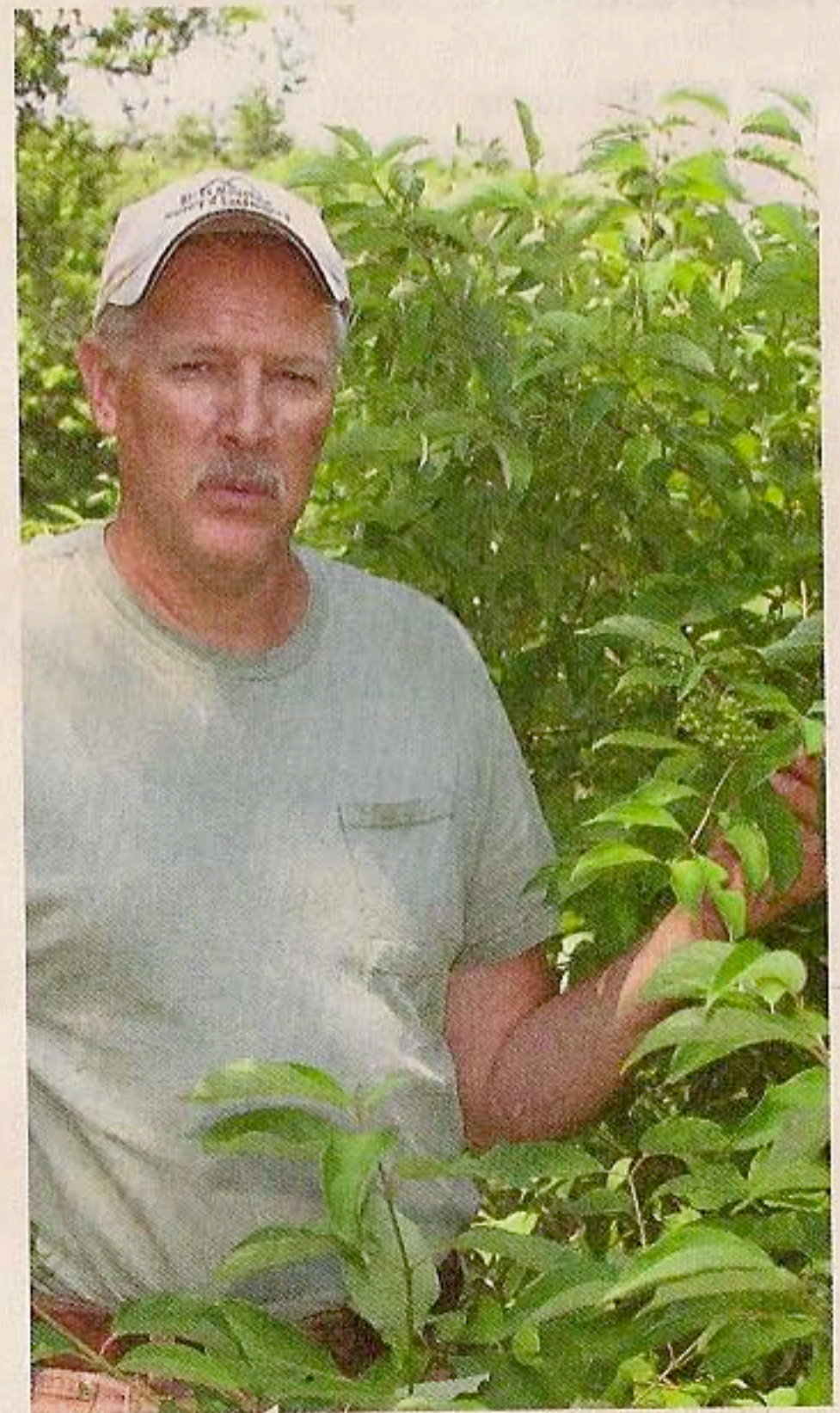
Last year he began working with researchers at North Carolina State University's Mountain Research Station in Fletcher, N.C. to test native species. "Hopefully, some of this work will tell us how far up the bank we can go with native species and what the survivability rate is for different species," he says.

Managing water resources has become big business in the Southeast, with companies from as far away as Pennsylvania offering native plants for western North Carolina. Johnson says the demand for his native species is increasing. Keeping streams stable and keeping sediment out is really an important issue for municipalities in the Southeast, he contends.

By keeping plants within 150 miles or so of their native habitat, Johnson says plants have a much better chance of survival. He stays within the same ecotype so that plants are easily acclimated to the area.

Some of the shrubs he plants are also a boon to wildlife. "We want the heavy root structure that will allow the plant to survive on the stream bank. At the same time we want it to look esthetically as a natural part of the environment." An added benefit, Johnson says, is that many of these native species produce berries that are highly attractive to deer and other wildlife.

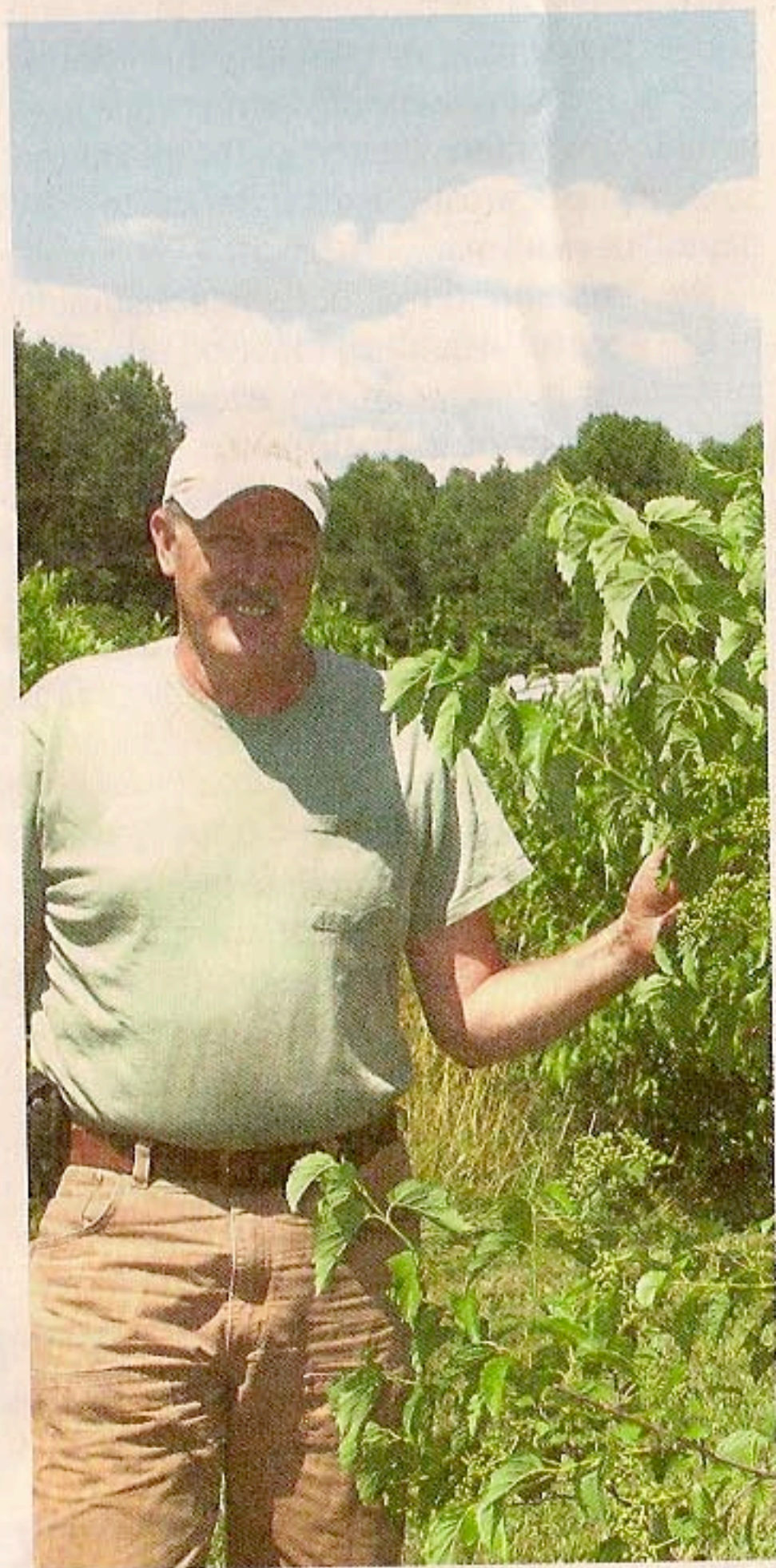
Plants like button bush, which produce a carpet of white flowers, or buttons, that flow down the stream bank have been used in residential landscapes. Though these species have been around for thousands of years, many people didn't notice them until they began to show up



**ALAN JOHNSON, checks silky dogwood used in western North Carolina stream restoration projects.**

in restoration projects.

For Johnson growing native species and using them to help manage the areas water supply is a labor of love. And, a labor that has played a key role in helping western North Carolina recover from one of the area's worst droughts ever.



**ARROWOOD VIBURNUM is one of the most popular native plants used by Alan Johnson in western North Carolina stream restoration projects.**