



United States Department of Agriculture
Natural Resources Conservation Service

Helping People Help The Land

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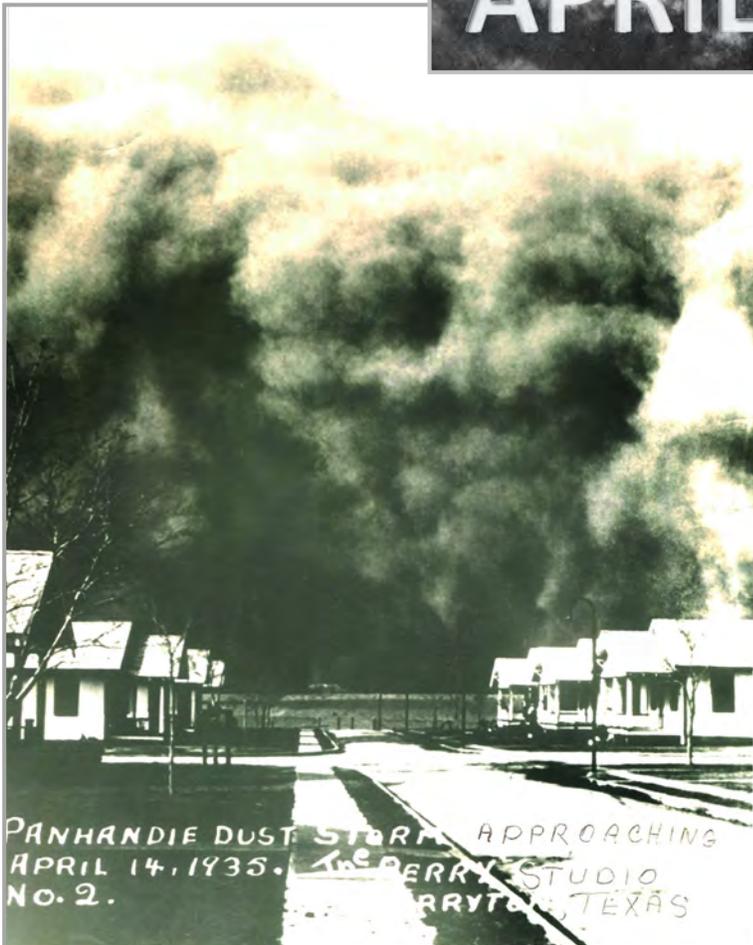
The Reverchon Naturalist

Recognizing the work of French botanist Julien Reverchon, who began collecting throughout the North-Central Texas area in 1876, and all the botanists/naturalists who have followed ...

Black Sunday An 80 Year Retrospective

Terri Walker

To 6-year-old Doris Veatch Crownover near Fritch, Texas, the Dust Bowl and the Depression were inseparable events.



There were days when Doris knew that the dust would come before the end of the school day. At school, a dust storm meant no outside recess, but rather tumbling on the two big mats teachers would bring in for such occasions. At home, it meant wet cloths covering faces to keep dust and sand out of eyes, nose, and mouth, and it meant nosebleeds. It also meant cleaning the entire house yet again, for dust, sand, and grit got into everything: in dishes, in bed clothes, and in hair. Sand sifted through windows and cracks and nothing was spared (Figure 1).

For Doris and her young brother, Floyd, it additionally meant whooping cough. There were plenty of challenges. Doris shared, "It was just a thing, it was what you accepted. It was the Depression days and to me it was all together, the dust and the Depression."

Figure 1. (left) Photograph of dust storm approaching Perryton, Texas on Black Sunday, April 14, 1935. Original photo by the Perry Studio, Perryton, Texas, and copy provided by Doris Crownover.

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Remembering the Dust Bowl

This issue, released April 13, 2015 is 80 years and a day after the single worst dust storm recorded during the Dust Bowl of the 1930s. April 14, 1935 will forever be known as Black Sunday. April 14, 2015 marks the 80th anniversary of this event. In this issue, we are pleased to share with you the words from Doris Crownover of Knox City, Texas who was six years old on that day and living in the Texas Panhandle north of Amarillo. Doris was interviewed by Terri Walker and this story is our lead article in this—our Dust Bowl issue.

In Timothy Egan's book, *The Worst Hard Time*, a great read on life during the Dust Bowl, he describes how one family resorted to canning young green tumbleweeds to eat. At times in today's world, we might think we have it rough, with deadlines or work piling up, but I don't believe we can really know hard times until you have had to eat canned tumbleweeds. Read co-editor Melissa Sturdivant's article on the iconic tumbleweed.

Texas and other states have known droughts in the past, most recently the one that began in 2011 and though weakened so far this year, might still cause hardships if it turns dry again later this summer. There were several photographers, reporters and even a film crew documenting the time period in the Great Plains called the Dirty Thirties. It is reported that even though the drought had been ongoing for

See You Down the Road

several years, the name "Dust Bowl" was not coined until the day after Black Sunday.

An Associated Press reporter named Robert Geiger who was travelling through the Great Plains wrote, "Three little words achingly familiar on a Western farmer's tongue, rule life in the Dust Bowl of the continent – *if it rains.*" Those words were likely repeated in the drought of the 50s, the late 70s, the mid 90s and beginning again in 2011. All in agriculture, from the farmers and ranchers to the seed, implement, fuel and other related dealers, depend upon a good rain to keep this country moving.

Another famous reporter of that period, Ernie Pyle, was traveling through southwestern Kansas, just north of the Oklahoma border in June of 1936 when he said, "If you would like to have your heart broken, just come out here. This is the dust-storm country. It is the saddest land I have ever seen." Will we ever see another Dust Bowl on the level of that in the thirties? Most say that we have learned from our mistakes and that conservation measures and efforts would prevent another great plow-up of this fragile land. We can only hope that this is true. I hope you enjoy this issue.

Ricky Linex

Ricky Linex is a Wildlife Biologist with the USDA-NRCS in Weatherford, Texas, and serves as the Co-Editor for the Reverchon Naturalist.

CONSERVE TEXAS: *We Salute the Soil*

Eighty years ago, on April 14, 1935, an ominous wall of blowing sand and dust swept across the Great Plains. This day is known in history as Black Sunday. During the 1930's, the Dust Bowl days were a period during which huge dust storms ravaged the Midwest because of years of overplanting, poorly managed crops and severe drought conditions. During that massive storm, people were forced to crawl on hands and knees in search of shelter, literally unable to see their hands in front of their faces. Cars stalled and stopped in the choking dust. Many thought the end of the world had come.

In response to Black Sunday, and the damage caused by dust storms, Congress passed Public Law 74-46 on April 27, 1935, and recognized that "the wastage of soil and moisture resources on farm, grazing, and forest lands... is a menace to the national welfare." This law established the Soil Conservation Service, now USDA's Natural Resources Conservation Service, or NRCS.

Salvador Salinas is the State Conservationist for the USDA-NRCS in Texas and resides in Temple, Texas.

Since that time, our commitment to soil science and soil health has helped America's private landowners implement conservation practices that protect and improve soil and other resources.

Healthy soils are the foundation of agriculture. In the face of mounting challenges such as a growing global population, climate change and extreme weather events, soil health is critical to our future. Healthy soil is essential as global demands rise for food, fuel and fiber.

As America's agency for soil conservation, classification and studies, NRCS is excited that 2015 will bring worldwide attention to the importance of soil. During the International Year of Soils, and on Earth Day 2015, we have lots to celebrate. Thank you to the farmers, backyard gardeners and all of our nation's conservationists who are doing their part to protect natural resources.

We salute the soil, and we hope you will too.

Salvador Salinas

Settling the Dust

Dee Ann Littlefield

“You couldn’t see. You couldn’t breathe. You couldn’t go outside for days,” remembers Eugene Littlefield. “It was awful.”

Littlefield is referring to the giant black clouds of soil that would blot out the sun and swallow the countryside (Figure 1). Born in Wayside, Texas in 1934, Littlefield was welcomed into the world by the Dust Bowl – an era in the 1930s when the most massive, brutal dust storms ever known to our nation repeatedly ravaged the Panhandle and Great Plains regions.

Littlefield was the only child of parents that raised cattle, wheat and sorghum on their farm 20 miles east of Happy, in the now-extinct community of Wayside.

“We could see those storms coming over the horizon,” he says. “The dirt would blow in your face and hit your skin so hard it hurt. Dad would get our animals in the best shelter he could, while my mom started packing the windows with rolled wet towels and hung sheets to try to keep dirt out. It still didn’t work,” he says, shaking his head at the fury and intensity of the storms. “Fine sand would get in our food no matter how well we protected it. It would get behind the wallpaper in our house. Our white sheets on the bed would turn brown.

“Mother would light kerosene lamps and you could barely see them for the brown haze around them,” he adds.

He recounts his family having to use a bucket for the bathroom because they couldn’t go outside to the outhouse. His dad had a rope tied from the house to the barn so if there was even the slightest reprieve in the raging storm he could go check on the animals. Littlefield says no matter how hard you tried to protect your equipment or

Figure 1 (right). A dust storm rolling across the Littlefield Farm in Swisher County, Texas, in 1935. This photo was taken at the intersection of FM 1075 and 2301.

Photo credit: Littlefield Family.

vehicles, the fine sand would penetrate the carburetors and wind up in fuel lines, rendering equipment inoperable until it could be repaired.

“I remember coming outside after the storms and you couldn’t find things,” he says. “You could see, but you still felt disoriented because the landscape would look so different. Tumble weeds would blow against the fences and get trapped, then the dirt would just pile up in them to the point it would bury the fence so deep in dirt you couldn’t see it. Entire plows could get buried and only the levers would be visible.”

The plowing up of native grasslands across the Great Plains left vast stretches of soil exposed to drought and wind. The 1930s mark a decade of the worst drought in U.S. history. Planted seeds would shrivel and die in the ground before they could ever sprout. With no plants to trap the soil or moisture, the parched dirt turned to powder that was easily carried away by wind.

This loss of land and crops only further deepened the effects of the Great Depression, to the point that by 1933 more than 11,000 of the nation’s 25,000 banks had failed and unemployment was at a record high 25 percent.

The Dust Bowl affected 100,000,000 acres, centered on the panhandles of Texas and Oklahoma, and adjacent parts of New Mexico, Colorado, and Kansas. In December 1935, experts estimated that 850 million tons of topsoil had been blown off the Plains that year alone. *(Continued on page 6)*



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Black Sunday—An 80 Year Retrospective)*

Doris went on to say that the dust “didn’t come up every day, but it seemed like it did. We always said, ‘Here comes Colorado!’ ” They took it in stride; they didn’t have much choice.

Nowadays, Doris works as the Wichita-Brazos Soil and Water Conservation District Clerk. Every afternoon, she works in the Knox City USDA-NRCS office with Charlie Schur, the District Conservationist. Every morning, you will find her at the Methodist Church, where she has worked as the Secretary for over 50 years.

Additionally, Doris serves as the Secretary for the Knox County Historical Commission, and for 37 years, she was the manager of the Knox City Chamber of Commerce. Perhaps perseverance was a lesson learned from her early days.

Fritch, in the southwest corner of Hutchinson County, Texas, was a small community where employees and their families lived in company housing for Texoma Natural Gas Company. Doris’ father, Floyd Veatch, worked at the plant where gas was gathered and sent to Chicago. Fritch had a grade school, but neighboring Phillips, Texas, had a high school plus a Baptist and a Methodist Church. Doris’ family lived in a company rent house which boasted two bedrooms and a back porch. Five girls—Edna, Billie, Frankie, Virginia, and Doris, were born within 7 years of one another,

but her brother came along 5 years after Doris. Such was life on the Texas Panhandle in the 30s.

The Dust Bowl, referred to the Great Plains region that measured 150,000 square miles, from the panhandles of Oklahoma and Texas, through sections of Kansas, Colorado, and New Mexico.

The problems began between 1914 and 1929 when farmers plowed up millions of acres of natural grasslands to plant wheat. Land that had not been plowed had been overgrazed by cattle. Rainfall had significantly decreased by the 1920s, but the official drought that initiated the Dust Bowl era started in the summer of 1930. When the winds started blowing in the early 1930s, it picked up the dry soil, scoured the landscape and transported the sandy soil far away, sometimes burying roads and fences. These dust storms were also known as black blizzards or black rollers (Figure 2).

Doris recalls a family trip to Dalhart to visit her grandparents. She commented, “I remember the depressed feeling I had because the houses were crumpled up and the fences were over, and the sand was drifted, and it might be drifted across the highway.” The sand and desolation continued all the way to Dalhart. The Dust Bowl made an indelible impression on all who experienced it.

Oklahoma Panhandle weather stations reported “moderate to heavy dust 20 days during the month [April 1935] and light dust on other days” in an

area sometimes referred to as “No Man’s Land,” according to the Oklahoma Climatological Survey (OCS).

One Sunday, in particular, stands out in the collective memories of our nation.

Doris remembers, too.

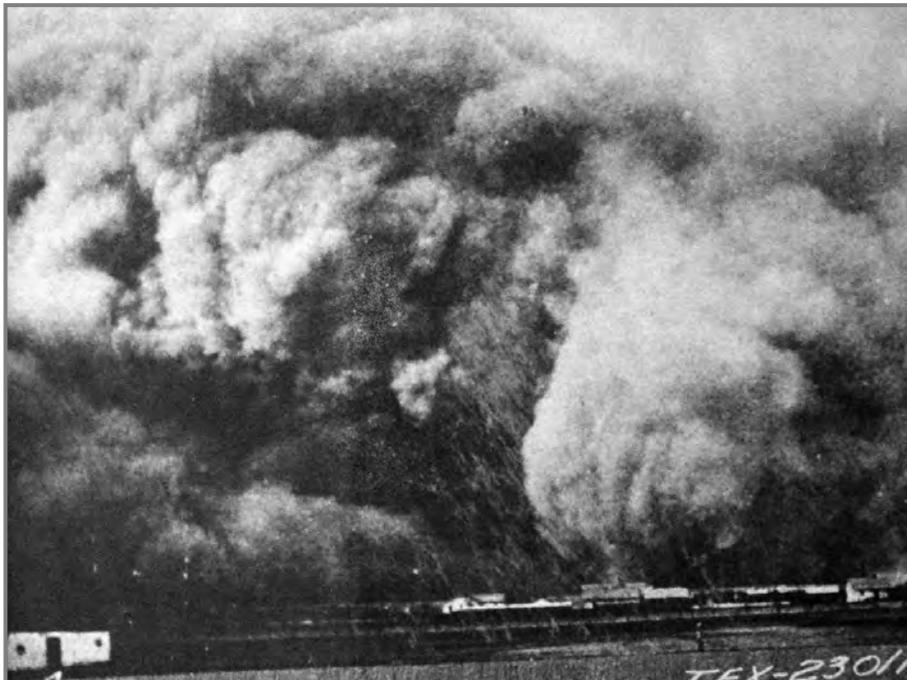


Figure 2 (left). A “black roller” or better known as a dust storm descends over the Texas Panhandle town of Stratford in 1935.

Photo credit: US Department of Agriculture.

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Doris' father was at work at the plant, and her two oldest sisters, Edna and Billie, were in Fritch visiting friends. Her other two sisters, Frankie and Virginia, were “playing down at the cattle guard” when her mother, Marie, looked up and saw a huge wall of black rolling in. Doris and one-year-old baby Floyd were in the house so her mother sent Doris to fetch her sisters back from the cattle guard. As Doris recounts the story, she comments, “It was so dark.”

Doris recalls they had “faith and trust” that her older sisters would be fine in Fritch since “there was no way to tell if they were playing outside or what. Mother had no idea when she worried if there’s a tornado behind it, Doris remembers.

“In those days,” Doris states, “we didn’t have any kind of weather people or TV or any way to find out what was going on. You just had to wait and see.”

Her mother wondered, “Was a tornado coming?”

It was Black Sunday, April 14, 1935.

In fact, 20 of the worst “black blizzards” occurred across the Great Plains on Black Sunday, one of which affected Texas. The National Weather Service, Norman, Oklahoma, reported that it hit the Oklahoma Panhandle first and then moved south hitting Amarillo, Texas at 7:20 in the evening and that the “blowing dust...resembled a land-based tsunami...with winds...upwards of 60 MPH.” The *Amarillo Daily News*, April 15, 1935, reported “8,000-foot-high clouds of dust.” Another paper reported that it resembled a tornado laying on the ground. The rolling black wall plunged the area into total darkness.

Hugh Hammond Bennett, the father of the soil conservation movement, was in Washington D.C. in April, 1935, and he was scheduled to deliver a report on soil erosion, which was labeled a “national menace.” Because news of the Black Sunday storm spreading towards the east reached Bennett, he delayed his speech to match the arrival of the dust storm.

Congressmen “were horrified at the fine, powdery sand choking their throats and scratching their eyes,” and according to the Oklahoma Climatological Survey (OCS), “using the moment to full effect,” Bennett proclaimed,

“This, gentlemen, is what I’ve been talking about.”

On the 27th of April, 1935, Bennett took charge of the newly created Soil Conservation Service (SCS), now the Natural Resources Conservation Service (NRCS). Previously, “the Dust Bowl was seen in the nation’s capital as just another facet of the Depression,” reports the OCS. Their experience taught them that it was a threat to national security.

Ricky Linex, Zone Biologist for the NRCS, states that according to *The Worst Hard Time* by Timothy Egan, the static electricity was so bad that cars would short out while being driven and stop. Other people reported that after one dust storm, what little wheat remained after the storm was burned up by the static in the air.

In December of 1935, soil scientists estimated that 850 million tons of topsoil was lost to wind on the southern Plains in 1935. A 1937 SCS publication* documents the erosion and deposition in the Dust Bowl region. In Moore County, the county west of Fritch, soil was picked up in the northern portion and up to six inches were deposited in the southeast part of the county where Lake Meredith would be built. The newly created SCS worked very hard documenting the effects of the Dust Bowl in order to ensure that good farming practices would reduce both wind and water erosion.

Doris remembers a couple of kids were outside when the black wall hit, “They were walking home from somewhere and were laid out, wrapped around a sage brush for protection, because there certainly weren’t any trees...Anyway, someone found them and then they got home. It was just such a frightening thing.”

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Press **PLAY**  and check out these special You Tube videos to commemorate the 80th anniversary of Black Sunday and to learn more about the soil mapping done in 1935 and 1936 of areas affected by the Dust Bowl!
CLICK ON THE LINKS BELOW!

Black Sunday 80th Anniversary
<https://youtu.be/JERIZAhPLZw>

Black Sunday 80th Anniversary, Part 2
<https://youtu.be/-ZKa483vH80>

SUBSCRIBE TODAY to
[NRCS Texas' You Tube Channel!](#)



*(Continued from Page 3—
Settling the Dust)*

The drought would linger four more years until rain finally brought relief in the fall of 1941.

Hard work preparing the land and planting the crops was met with years and years of crop failure. With no crops to harvest and no grass for livestock to eat on their Swisher County farm, the Littlefields struggled along with so many, just desperate to survive.

“We were excited when my dad got a job with the Civilian Conservation Corps to help build a road across Palo Duro Canyon,” Littlefield remembers. “But when they found out he was selling milk from our milk cow to the neighbors, they considered that a job and let him go so they could hire someone else that was unemployed.”

During this time there was one man that was strongly convinced he had a plan to keep so much of America’s top soil from blowing away. In 1928, while working for the U.S. Department of Agriculture as a chemist with the Bureau of Soils, Hugh Hammond Bennett wrote about the ongoing soil erosion issue in a government report.

“To visualize the full enormity of land impairment and devastation brought about by this ruthless agent is beyond the possibility of the mind. An era of land wreckage destined to weigh heavily upon the welfare of the next generation is at hand,” he wrote. Through his experience with soil surveys, Bennett realized the effects of soil erosion and the negative impacts it had on agriculture.

His persistent admonition about the devastation of farmland that was occurring across the nation’s landscape led Congress to establish the USDA’s Soil Conservation Service (SCS), now known as Natural Resources Conservation Service (NRCS).

The establishment of the SCS marked the beginning of federal funding and natural resource education to landowners, especially farmers. States established state soil conservation agencies and procedures whereby local Soil and Water Conservation Districts (SWCDs) could be formed in counties across the U.S. SCS assistance was delivered at the direction of the local SWCD board, made up of five landowners from across the county.

The agency employees would hold workshops and in some cases go door-to-door to educate farmers on soil conservation and anti-erosion techniques,



Figure 2 (above). Photo demonstrating early techniques of contour plowing which was introduced to farmers during the droughty years of the Dust Bowl era. *Photo credit: USDA-NRCS.*

including crop rotation, strip farming, contour plowing, terracing and other beneficial farming practices (Figure 2). The agency provided financial incentives to help farmers offset the costs of adopting some of these practices. Littlefield remembers the local SWCD presenting a film about soil erosion at his Wayside Grade School.

“I remember the conservation service men coming by to teach us how to put nutrients back in the soil by rotating our crops,” Littlefield says. “We planted rows of trees, a shelterbelt, to act as a windbreak for our fields. We started terracing our fields to hold the water better. It made a big difference.”

The land care lessons his family and others received in the 1930s paid off in the 1950s when another historic drought had America’s farmland in its grip.

“The SCS helped us know how to take care of our land, even in hard times,” Littlefield says. “They taught us about strip till farming and the equipment we needed to have to farm in better ways. I really feel like the Graham-Hoeme chisel plow saved this country from blowing completely away.”

The plow featured reversible chisel points that were used for erosion control and primary tillage. Special “low-crown” 16-inch-wide sweeps were developed for shallow weed control before planting. The sweeps left about three-quarters of the stubble covering the soil surface, reducing the soil dryness and preventing wind erosion. This was one of the first tools available to perform “stubble-mulch” throughout the Great Plains.

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Settling the Dust*

Littlefield still owns farm land in Swisher County. As a young child, experiencing first-hand the largest man-made ecological disaster our nation has ever seen made a lasting impression on Littlefield. He wants to do everything he can to save the soil on his land. He enrolled his farm land, most of it with highly erodible soil, in the USDA Farm Service Agency's (FSA) Conservation Reserve Program (CRP). Participating as a SWCD co-operator, he worked with NRCS to develop a conservation plan and proper management for his CRP.

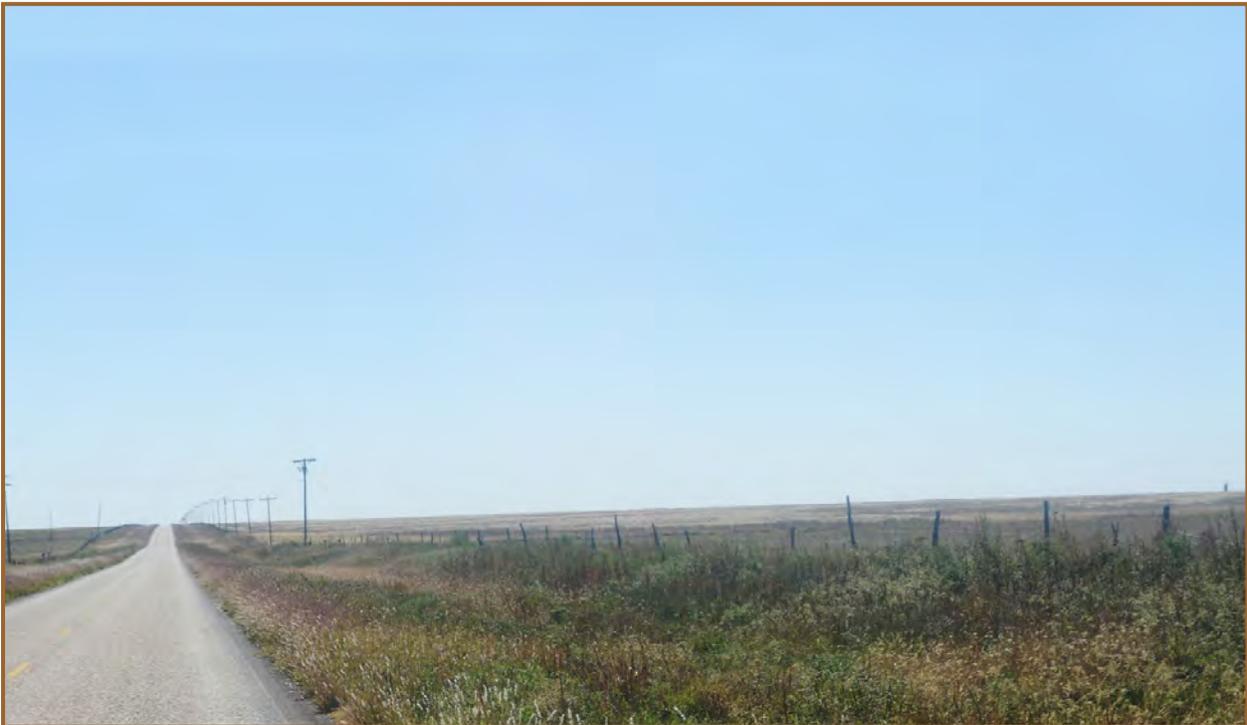
When his CRP contract expired in 2011, Littlefield immediately enrolled it in the USDA's State Acres for Wildlife Enhancement (SAFE) program, administered by FSA, with NRCS providing technical assistance and conservation planning advice. In the SAFE program, Littlefield relies on NRCS to help him remove the existing introduced

bluestem grass to prepare the acres for planting native plants to improve wildlife habitat for such threatened and endangered candidate species as the Lesser prairie-chicken.

"Seeing what I saw growing up as a boy on our farm, I have witnessed the positive effects over 70 years of conservation efforts have had on our land," Littlefield says (Figure 3). "I am now proud to say I am a landowner that is making a difference for the environment, and in the process, I hope to be able to help the prairie chicken populations."

Bennett, known as the Father of Soil Conservation, perhaps said it best: "Farmers have only temporary control over their land. It can be theirs for a lifetime and no longer. The public's interest, however, goes on and on, endlessly, if nations are to endure...."

Figure 3 (*below*). Photo of same location (intersection of FM 1075 and 2301) taken in 2012 after 77 years of conservation. The once bare ground is enrolled in USDA conservation programs and now boasts thick grass stands. *Photo credit: Littlefield Family.*



Dee Ann Littlefield is the State Public Affairs Specialist for the USDA-NRCS and resides in Henrietta, Texas.



Image courtesy of: The Goldthwaite Eagle. May 20, 1971. Goldthwaite, Texas.

*"A nation that destroys its soil,
destroys itself."*

- Franklin D. Roosevelt

***Days of Dust:
The Legacy from the Dust Bowl***

Ricky Linex

On October 11, 2012, author Timothy Egan (Figure 1) was in Canyon and Amarillo, Texas, for discussions of the people, places and events described in his 2006 published book, *The Worst Hard Time*.

During a morning session at the Panhandle Plains Historical Museum in Canyon, an overflow crowd of more than 100 gathered to hear how local, state and federal responses affected life during the Dust Bowl days. Many in this crowd appeared to be old enough to have seen and lived through the 1930s as children. During the evening, Egan addressed approximately 300 attendees in Amarillo as part of an *Amarillo Reads* event that is part of an August-December observance called *Days of Dust*.

Highlights of Egan's presentation are listed below:

- ◆ The Homestead Act of 1862 provided 160 acres of land west of the Mississippi River for people to own and operate.
- ◆ The Enlarged Homestead Act of 1909 increased the acreage to 320 acres to encourage dryland farming.
- ◆ The Stock-Raising Homestead Act of 1916 increased the acreage to 640 acres.
- ◆ The peak of American homesteading was in 1914 and not in the late 1800s as might be thought. There were 53,000 claims on the High Plains for homesteads in 1914—Every man a landlord!
- ◆ Upon seeing the steel plow turning the buffalograss sod, a Native American remarked that the grass was *wrong side up*, perhaps predicting future problems within the area of the Great Plains.

Franklin D. Roosevelt began his first presidential term in 1933, during the combined hardships of the Depression and the Dust Bowl. He appointed Henry Wallace as Secretary of Agriculture who initiated several new programs to ease the suffering and stabilize farm prices, part of Roosevelt's "New Deal" Programs. "The Constitution of the United States does not guarantee the rights of a pig to grow to full pigginess" quoted Henry Wallace, in support of the killing and processing of 6.4 million pigs in August-September 1933.

The pig slaughter was part of the Agricultural Adjustment Act which helped stabilize commodities including wheat, corn, cotton, tobacco, rice, hogs, and milk.

The Civilian Conservation Corps (CCC) began in



Figure 1 (*above*). Author Timothy Egan discusses the effects of the Dust Bowl, and implications to the present and future during his October 11, 2012, visit to the Panhandle-Plains Historical Museum in Canyon, Texas.

Photo courtesy of: Amarillo Globe-News.

1933 putting unemployed, unmarried men 17-28 years of age to work in public work relief projects across the nation. Among many projects completed in Texas were state parks, roads and schools.

Within the Great Plains area, 217 million trees were planted in shelterbelts. By the time the program ended in 1941, 2.5 million young men had worked on CCC projects. In 1933, FDR established the Soil Erosion Service, later becoming the Soil Conservation Service (SCS) in 1935, which helped farmers heal the land damaged during the Dust Bowl.

Changes in farming techniques, demonstration projects and planting some land back to native grasses helped restore the land.

Hugh Hammond Bennett was the first Chief of the SCS. Soil and Water Conservation Districts (SWCD) were established beginning in 1937 with Brown Creek SWCD, North Carolina being the first district established. *(Continued on page 18)*

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Figure 3 (left). Knowing firsthand how important conservation is, Doris shares the conservation message with many cooperators in the Wichita-Brazos Soil and Water Conservation District.

Photo credit: Charlie Schur, USDA-NRCS

Her daddy finally came home bringing the two oldest girls with him.

After he turned the headlights off, it was so dark, and he had to cling to the fence posts to get to the house. The family was together again, and everyone was safe.

The dust storms lasted all through Doris' grade school days. She vividly remembers when, in 1941,

the rain started coming. Doris recalls, "Then, the school bus would get stuck...so the boys would have to get out, push the bus or get it out of the ditch." The record rainfall broke the Dust Bowl.

Nevertheless, Doris still loves the Panhandle country's cool breeze at night and the deep azure blue sky in October. She remembers walking out on the prairie, noticing things like the Indian blanket, and the other flowering plants, as well as recalling that she and her family used to play at the Canadian River in the days before the dam for Lake Meredith was built.

Doris (Figure 3) emphasizes that "before coming to work for the [Wichita-Brazos SWCD], I had no idea of the tremendous work done in the past and the present to conserve our land... I have a deep appreciation for all."

*Joel, A.H. 1937. *Soil Conservation Reconnaissance Survey of the Southern Great Plains Wind-Erosion Area*. Technical Bulletin No. 556. U.S. Department of Agriculture. www.purl.umn.edu/165669

Terri Walker is a Soil Conservationist for the USDA-NRCS in Weatherford, Texas.

Conserve Our Soils For Those Generations Yet To Come

THEIR FUTURE PROSPERITY
DEPENDS ON YOU!

Good Conservation
Depends Upon
the Farmer or Rancher

FROM THE SOIL SPRINGS LIFE!

First the soil goes, then everything that is prosperous will follow. We all have a stake in the land . . . let's keep it productive!

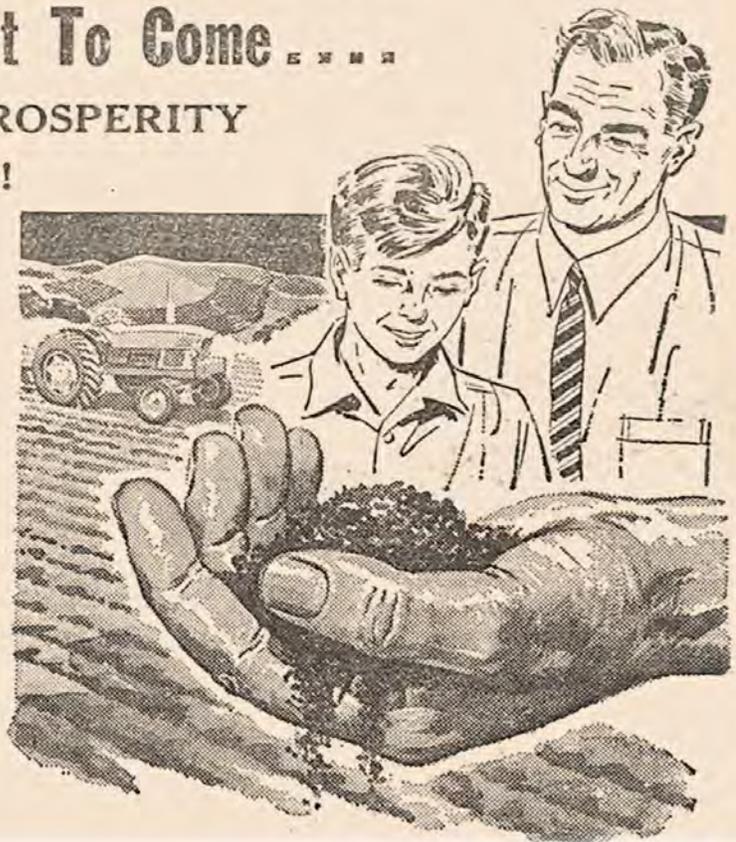


Image courtesy of: *The Goldthwaite Eagle*. May 20, 1971. Goldthwaite, Texas.

Blow-Out Mesquite

Kent Mills

I came across this mesquite cluster in a blow-out area on a ranch in Hudspeth County about 50 miles east of El Paso and north of Fort Hancock while taking a forage sample in 2010 (Figure 1). I don't know what caused this particular blow-out as drought, overgrazing, or soil types can all contribute to help wind and water create them.

One interesting thing, to me, about this site was that there was an abundance of quality forage in a well-managed pasture around the blow-out area, which was relatively small. This ranch has been in the same family for more than the 40 plus years that the current manager has worked there, and has always been moderately stocked with cattle to insure the health and sustainability of the range resource. It has an exceptional population of Pronghorn Antelope and Mule Deer on the ranch.

The pictures of the mesquite should help give us an understanding of how difficult it is to manage mesquites in the Trans-Pecos region. The mesquite plants in this part of Texas are “scrubby” plants that seldom get more than 3 to 5 feet in height. But as you can see, the underground mass in relation to the potential leaf area is much more extensive than we normally think of mesquites that grow in areas of greater rainfall. This makes this plant much more difficult to control with chemical or mechanical types of control.

The large stems are actually the rhizomes of the plants (Figure 2), which can spawn new shoots and will have to be uprooted, or killed by chemicals to eliminate the plant. I have no idea as to how old this plant is, but I'll bet it's seen a lot of years and a lot of challenges to its survival.

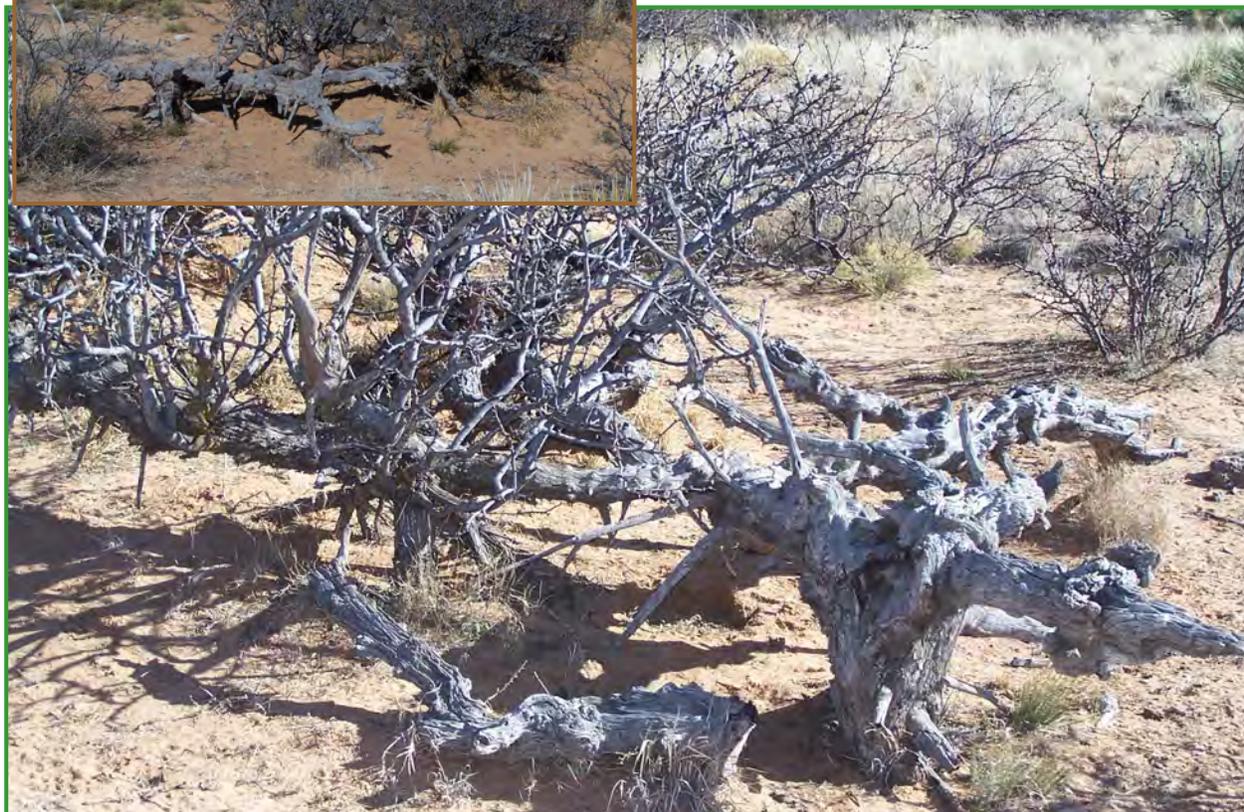
Kent Mills is a Nutritionist for Hi-Pro Feeds, Inc., and lives in Hermleigh, Texas.

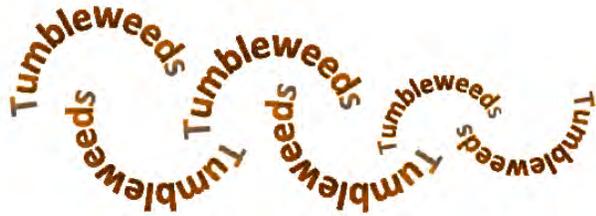


Figure 1 (left inset). Rangeland with blow-out mesquite growing in the Trans-Pecos region of Texas.

Figure 2 (below). “Scrubby” mesquite such as this might be typical of what occurred during the droughty years of the Dust Bowl and later in the 1950s.

Photos credit: Kent Mills.



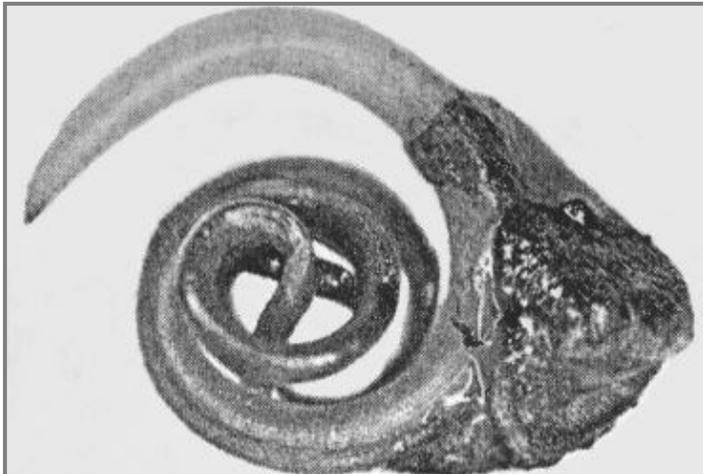


*Tumbling tumbleweeds...
See them tumbling down,
Pledging their love to the ground...
I'll keep rolling along...*

Either you are humming along now or in your dream-like state, you see the dusty Plains and hear the siren call of a harmonica in the background – probably as you sit in the rocking chair on the front porch, and then, you see it – the lonesome tumbleweed literally roll by as the wind carries it, and then picks it up and continues to roll it along. Tumbleweeds were forever made famous by those westerns—now, an iconic symbol of the West, along with cowboys, quiet sunsets and drifting winds.

Now, be the tumbleweed; you are the tumbleweed. And, if you could reach out and grab something with those skeletal stems and prickly leaves, you'd latch on with desperation. You'd try to find shelter and get out of the wind; to heck with that tumbling along. It's time to put down some roots – start a family. The fence row looks good! That 'ol barn looks great!

Tumbleweed (*Salsola tragus*), also known as Russian thistle, is a noxious shrubby, warm-season annual with stiff branches and prickly leaves. It grows to about 3 feet in height and width taking on



a spherical shape as it matures. It is usually found in disturbed sites, waste areas, along roadsides and fencerows, and in cultivated fields (Figure 1).

The seed of tumbleweed is a naked, coiled embryo (a plantlet) and begins to uncoil when exposed to optimal temperatures and moisture conditions (Figure 2). This plant is well adapted to arid and semi-arid regions. A member of the Goosefoot Family (Chenopodiaceae), all species of the *Salsola* genus are native to Europe.

In fact, it is believed that this plant hitched a ride in the lining of an immigrant's pocket containing flaxseeds around 1873. An excellent adaptation of this plant is that as it matures and dries, the plant breaks off at the ground, and begins to tumble, lending to its naming of *tumbling* weed or tumbleweed. This is a natural seed dispersal method for this annual in its native Russian Steppe environment; however, in our ecosystem, the plant quickly establishes itself early in the spring, and then out-competes native plants for nutrients and water. It thrives in droughty conditions. Nowadays, it occupies most of the United States, north into Canada, and south to Central and South America.

In addition to its noxious and aggressive growth tendencies, once they get rolling, tumbleweeds can pose a hazard on roadways, and contribute to the spread of fire in a wildland fire situation.

Figure 1 (above). Abandoned farm equipment overtime becomes a haven of stockpiled tumbleweed skeletons.

Photo credit: Randy Linex, USDA-NRCS.

Figure 2 (left). The seed of tumbleweed (*Salsola tragus*) begins to uncoil and extend its taproot deep into the soil within 12 hours of the right temperature and moisture.

Photo credit: UC Davis

<http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7486.html>

(Continued on next page)

(Continued from Page 11—
Tumbling Tumbleweeds)

Skeletal remains of the plant reportedly can persist up to a year trapping sediment and burying equipment, fences and other structures (Figure 3). Seeds can be viable from 1 to 3 years following dispersal as they wait until conditions are favorable for germination. Researchers found that average-sized shrubs can have 10,000 or more seeds, and larger plants can produce hundreds of thousands of seeds per shrub plant! Imagine the reproductive potential of the *tumbling* tumbleweed!

Is there any good offered by Russian thistle? The two best answers are: of course and it depends. Young growth offers good forage for livestock. In fact, during the Dust Bowl years, in Canada, in periods of severe drought, farmers were paid to use young tumbleweed plants as hay and silage for their livestock.

Young tender tips of new growth for the plant are reportedly excellent when steamed or cooked. Collect leaves that are no longer than five inches in length (Figure 4). Other plants in the Chenopodiaceae family include lamb's quarter which was historically a favored green of many Native American tribes.

In Timothy Egan's book, *The Worst Hard Time*, he wrote about the Folkers family and how they had to use tumbleweed as cattle feed, and then how they had to resort to the family eating the tumbleweeds...“Folkers had been one of the first nesters to salt this thistle, making it edible for the cattle.”

He also wrote about how the Lowery's canned “the thistles in a brine” and folks wondered how on earth they could eat tumbleweeds. The Lowery's responded, “Yes, it's dry as cotton, as flavorless as cardboard, as prickly as cactus...but, they were good for you. High in iron and chlorophyll.” Egan further reported that “Cimarron County [Oklahoma] declared an official ‘Russian Thistle Week’...urging people who were on relief to get out to the fields and help folks harvest tumbleweeds.” There is no doubt, times were definitely tough.

This plant is a major pollen producer and noted allergen source for many people, especially in West Texas. With its alkali properties, it was reportedly burned to make soap for thousands of years. In fact, soaps are still made today in this manner in the Mediterranean region. Some have suggested that tumbleweed should be cultivated, pressed into logs and used as a fuel source.

Control options involve mechanical removal such as mowing or tillage before seed set occurs. Of course, exposing the soil through excessive tillage will result in more seed germination, so it is an ongoing battle to get control of Russian thistle once it gets established. Use of biological controls has been explored and still being pursued. The USDA's Agricultural Research Service is seeking approval to unleash a fungus among the tumbleweeds. This fungus which is native to Russia may offer options for control of the noxious weed, but it is not yet approved for release at this time.

Talk about being resourceful and some folks finding a rainbow in a stormy sky, and a way to earn a living...Did you know that you can purchase “baby” tumbleweed about 6 to 12 inches in size from a retailer for about \$20?

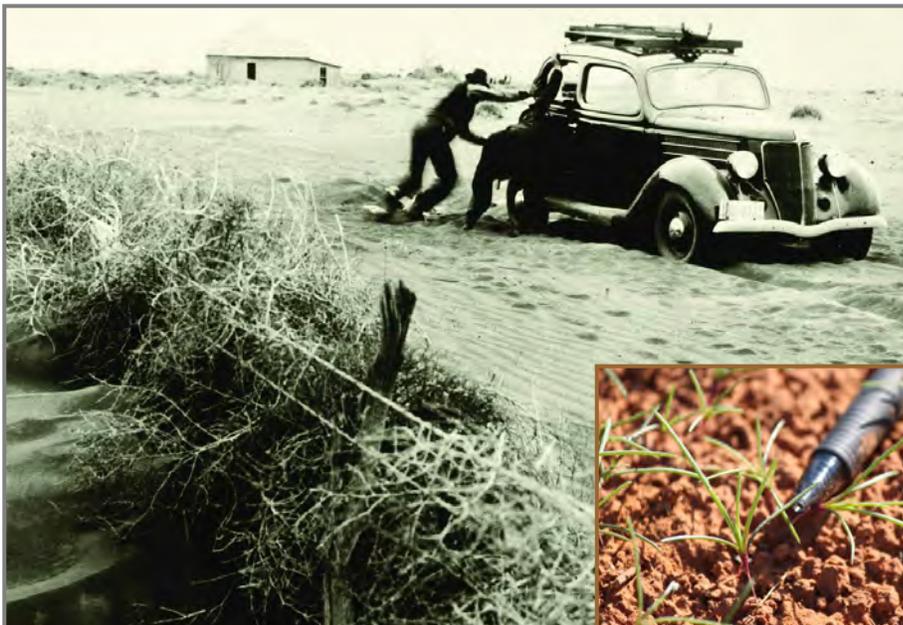


Figure 3 (left). Machinery clogged and buried with blowing dust. Notice the tumbleweeds piled next to the fence row which is now a fraction of its original height.

Photo credit: USDA-NRCS.

Figure 4 (left inset). Seedlings of tumbleweed (*Salsola tragus*) getting a head start.

Photo credit: Randy Linex, USDA-NRCS.

(Continued on page 18)

The Father of Soil Conservation

Hugh Hammond Bennett

Hugh Hammond Bennett, the father of soil conservation in the United States and the first Chief of the Soil Conservation Service [now the Natural Resources Conservation Service], joined the Bureau of Soils in 1903 as a soil surveyor.

His crusading zeal for conservation was born of his experiences studying soils and agriculture, nationally and internationally. The gullied land as well the less visible evidences of what he called sheet erosion convinced him of the need for conservation.

As evidenced by the passage of the Soil Conservation Act of April 27, 1935, and the growth of the Soil Conservation Service into the preeminent conservation agency, his success was due in no small part to his great skills as a communicator. He became the master of the written and the spoken word in the cause of conservation.



Hugh Hammond Bennett

(April 15, 1881–July 7, 1960)

Photo source: USDA-NRCS.



Figures 1 & 2 (above). Hugh Hammond Bennett surveys an eroded farmland in Michigan., and the same farm following implementation of soil conserving practices. *Photos credit: USDA-NRCS.*



Image courtesy of: The Goldthwaite Eagle. May 4, 1961. Goldthwaite, Texas.

Ralph Schwartz Recalls Work On Soil Survey In Dust Bowl

Colleen Schreiber

Ralph L. Schwartz (Figure 1) was a member of the one and only survey team to evaluate the damage done during the Dust Bowl of the 1930s. At 92, he is also the oldest living member of the Soil Conservation Service, today titled the Natural Resources Conservation Service. He joined the ranks only a month after the new organization was born.

Schwartz himself was born in October 1906 in southeastern Ohio. His folks moved to Grand Prairie, Texas, after he was born, and then in 1907 to Holly, Colorado, 25 miles east of Lamar, where they homesteaded 160 acres and built a two-room buffalo sod house. Buffalograss was about all that grew in this low rainfall, flat prairie land. It was durable and suitable for this 17 to 18-inch rainfall area. Since there was no lumber, homesteaders built their houses of its sod.

Schwartz recalls that it was difficult to break out the ground with a horse and plow. His father raised broom corn, used to make brooms in those days, and because little else would grow in this arid region, it was their cash crop.

It didn't take long for his father to realize there was no way to make a good living there, so the family was on the move again almost as soon as he "proved it up," this time to a small oilfield town, an "oil camp," Schwartz called it, in Oklahoma. It was the fall of 1910.

Tragedy struck the family when Schwartz's mother died. He was only four and a half, his younger brother only 18 months old. The brothers moved back to Ohio, where Schwartz lived with his grandfather on his mother's side for about four years and then his grandmother on his father's side for another four years. He's been on his own since he was 14.

Schwartz took a job with an English family who owned a small dairy. It was farm labor for a \$1 a day keeps, Schwartz says.

"Butter was their cash crop. It wasn't a big dairy, 10 to 12 cows, but we churned butter twice a week," he recalls. "I took the butter to town and sold it to individual families. We got about 10 cents a pound more that way."



Figure 1 (above). A pioneer in the science of soil conservation, Ralph Schwartz, studied the 1930s Dust Bowl up close and personal. Photo courtesy of: *Livestock Weekly*.

This English family came to southeastern Ohio in 1803, not long after the area was settled. The couple with whom Schwartz lived were only second, possibly third generation. They didn't have any children.

"It was my home, really, for eight years through high school and college."

Schwartz worked his way through college, living on the dairy farm, milking cows in the mornings and evenings and waiting tables at the university hospital by day. He graduated in 1929 from Ohio State University with a degree in ag chemistry and agronomy.

He then took a job on the state campus staff at College Station, Texas. He was under the supervision of the Experiment Station, doing primarily analytical work on soils, crops, feeds, fertilizers, etc. During the time he was there, Schwartz figures he ran analyses on some 50,000 samples.

It was hard work, and as the Depression dragged on, Schwartz' salary was cut by 25 percent; after three years he was making less than when he started.

Farming was modernized beginning in the 1920s when tractors came on to the scene. Good or bad, that allowed the flat, treeless country of the Southern Great Plains to be broken by the steel plow.

(Continued on next page)

*(Continued from Page 14—
Soil Survey in Dust Bowl*

It was promoted to those who didn't have a better place to go as the "Garden of Eden," a place where a farmer could take advantage of fresh, fertile land.

A new variety of winter wheat, Turkey Red, was introduced, which Schwartz said also helped increase prospects on the southern Plains.

Wheat was in great demand, and farmers planted it fencerow to fencerow. In 1931, the nation reported a record-breaking wheat crop. Still, demand exceeded supply and farmers received record high prices for their crop.

Schwartz remembers running analyses in 1930-31 on the wheat grown in this fertile new ground of the Southern Great Plains. The protein content, he says, ran as high as 11 to 12 percent. In other places it averaged 8.5 to nine percent. He attributed the difference primarily to the virgin soil and the fact that it had not yet lost much of its organic matter.

The high protein wheat, Schwartz notes, was used for pretzels, and because of that it brought a 20 percent premium. Thus what would have been 25 cent per bushel wheat became 30 cent per bushel wheat.

"Suitcase farmers" came by the droves to the Plains, Schwartz says. These were city folk from Wichita, St. Louis and the like, speculators who didn't operate the land themselves. They contracted out the farming and only came out sometimes in the fall during planting and on occasion at harvest to reap the rewards of a crop they did nothing to make. None knew the first thing about conservation, Schwartz adds.

A severe drouth, not only more predictable today than it was then, enveloped much of the country and set the stage for what was to come. From about 1932 through 1935, Schwartz says, the southern plains received only five to six inches of rain. The wind began to blow, and it blew for the better part of a decade. In no time this "Garden of Eden" turned into a vast stretch of barren soil.

The area most severely affected encompassed 100 million acres in five states, including the panhandles of Texas and Oklahoma, Western Kansas and Eastern Colorado, and Eastern New Mexico.

Some called the area an American Sahara.



Figure 2 (above). As Schwartz describes, planting of Turkey Red wheat takes hold on the Southern Plains...Wayne Lewis and his father and brother harvesting wheat in 1933 in Gate, Oklahoma. Photo courtesy of the Lewis Family. Photo source: www.pbs.org

Journalists dubbed it the Dust Bowl.

For those like Schwartz, who lived through it, it was the "Dirty 30s." Many were convinced and feared that these "black blizzards" that became part of their everyday life as the drouth ensued signaled the end of the world.

In 1932 historians recorded 14 dust storms; in '33 there were 38 such storms, and with each year it worsened. Farmers got to where they could pinpoint the origin of the storm by the color of dust: red for Oklahoma, black for Kansas and gray for Colorado and New Mexico.

The spring of 1935 was the worst of the worst. Historical accounts record that the wind blew for 27 days and nights, and beginning in April there were 47 days when visibility was limited to six miles; the majority of the time it was less than one mile. April 14, 1935, went down in the history books as the worst day of all. It was called "Black Sunday."

Schwartz remembers that day because he was en route to Texas when the storm hit. He stopped to pick up a soldier who was hitchhiking. They made it to Raton before getting stuck right in the middle of the asphalt road. The GI got out to push while Schwartz maneuvered the car. Schwartz could barely see headlights from an oncoming car and the other car apparently didn't see Schwartz's lights. The two vehicles barely missed each other. It was 2:30 in the afternoon.

It was a terrible time, Schwartz says. Many families had very little to eat. Many lived on cornbread and beans, and it almost always had a gritty taste. School children had to wear masks to school to help keep the dust out of their respiratory system. Many schools closed altogether. *(Continued on next page)*

(Continued from Page 15—
Soil Survey in Dust Bowl)

Livestock were malnourished because there wasn't any native vegetation and no extra byproducts to feed them, either. In 1934 the government paid farmers \$16 per cow and \$3 for their calves.

Another indication of the lack of vegetation came from one historical account which reported that someone found a crow's nest made entirely of barbed wire.

Farm families hung on for as long as they could, but in the end many deserted their homes. By some accounts the exodus ran as high as a quarter of the population in the Dust Bowl region. Most of them moved west to California, where they worked as migrant labor.

Washington bureaucrats originally saw the problems plaguing the southern Great Plains as simply another crisis of the Depression. But Hugh Bennett saw the crisis for what it was, and he set out to make lawmakers understand the significance of it all. He ardently promoted the concept of employing conservation techniques on the southern Plains. His most effective lobbying aid was a terrible dust storm that passed over Washington as he was testifying before the Senate Public Lands Committee.

The end result was the Soil Conservation Act of April 17, 1935, which transformed SCS from temporary status to permanent. Hugh Bennett became the father of the SCS.

The SCS became official on April 20, 1935, and one month later, on May 20, Schwartz went to work as a soil scientist for the new organization for \$2000 a year.

“Almost invariably,
conservation farming—which,
after all, is common sense
farming with scientific methods—
begins to show results the very
first years it is applied.”

- Hugh Hammond Bennett

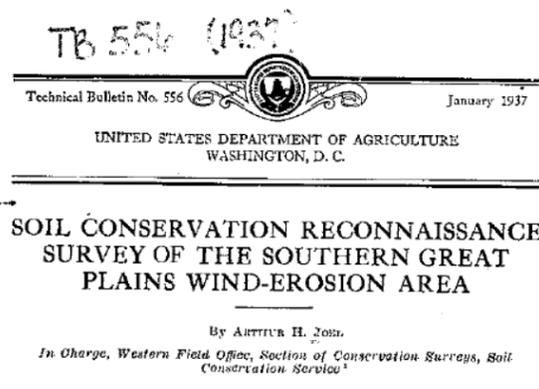


Figure 3 (above). Title page from the publication Schwartz referenced which reported on the damages resulting during the Dust Bowl. Photo credit: USDA. Image source: <https://ideas.repec.org/>

In November he became part of a 21-member team, the one and only of its kind, directed to evaluate and survey damages in the Dust Bowl area.

The purpose of the survey was to analyze and evaluate erosion. The team evaluated 25,000 square miles in 20 counties. A map was prepared for each county. Three counties were mapped in Colorado; Kansas had six counties, Oklahoma three and Texas eight. Schwartz worked mostly in Southern Colorado and the Panhandle of Texas.

The men used ownership maps to help draw up their maps. Soils were examined on two sides of every section. The team recorded the kind of soil, how much erosion they thought had occurred, the slope, etc.

"The soil maps were crude compared to what they do now," Schwartz remarks.

The team started in November 1935 and finished up the latter part of April 1936. Baca County in southeastern Colorado, Schwartz says, was considered one of the worst hit. The Oklahoma Panhandle was considered bad. Oldham County in Texas had "medium" damage, he recalls.

"In Deaf Smith County the soil profile was predominantly a very smooth hardland. The type of erosion here was different. It didn't move off, just stacked up," Schwartz says.

The scientist has a copy of the survey he helped conduct. Entitled the *Soil Conservation Reconnaissance Survey of the Southern Great Plains Wind-Erosion Area*, it was published in January 1937 (Figure 3).

(Continued on next page)

(Continued from Page 16—
Soil Survey in Dust Bowl)

The drouth did finally end, and it was decided that the nation couldn't allow farmers to fail.

Conservation practices were put into place. However, Schwartz says, many of the old timers wouldn't follow them, so the government began paying them to do the practices. In time the country healed over. Today a large majority of what was considered the Dust Bowl area is now back in native pasture.

Water erosion, Schwartz, notes, can be just as severe as wind erosion when there's nothing to break the impact of the raindrop.



ALL LIFE IS DEPENDENT UPON SIX INCHES OF EARTH!

The land we live on is covered by six inches of rich top soil. Without it, all life would cease—Nature's bountiful gifts of water, woodland and farmland become wasteland!

Image courtesy of: *The Goldthwaite Eagle*. May 23, 1963. Goldthwaite, Texas.

To learn more about the Dust Bowl, consult these resources:

Ken Burns' PBS film: <http://www.pbs.org/kenburns/dustbowl/>

The Plow that Broke the Plains video:
<https://www.youtube.com/watch?v=fQCwhjWNcH8>

http://climate.ok.gov/index.php/site/page/news/black_sunday_remembered

http://www.crh.noaa.gov/news/display_cmsstory.php?wfo=ddc&storvid=50702&source=0

<http://www.perryton.com/black.htm>

<http://www.tshaonline.org/handbook/online/articles/vdd01>

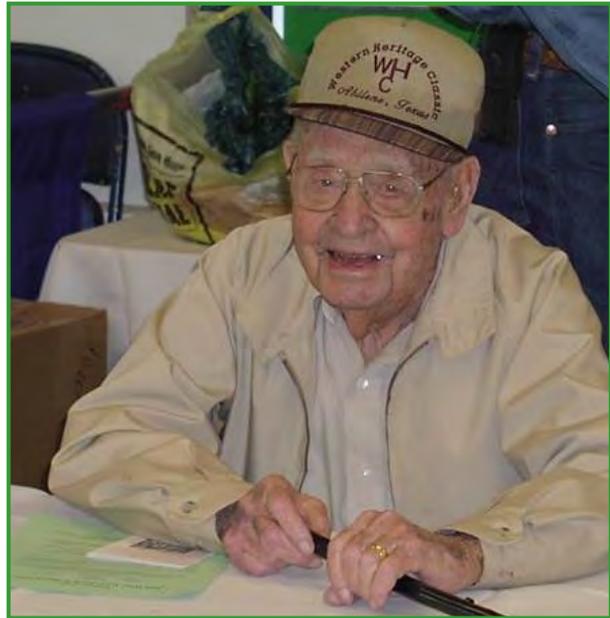


Figure 4 (above). Ralph was a Soil Scientist from 1935-1965 and then Executive Director of the Middle Clear Fork SWCD from 1965-1985. Even after his retirement, he continued to volunteer for the district until his death. Here, Ralph helps out at a tree sale in Abilene in the late 1990s.

Photo credit: Ricky Linex, USDA-NRCS.

People don't realize the force of rain," he says.

"Water is heavy. On a square foot, 12 inches square, an inch of water weighs 5.1 pounds; multiply that by the number of square feet in a mile, 43,560, and that figures out to about 110 tons of water. It's unreal what a pounding the surface takes, so if you can keep it covered you cut down on erosion."

Schwartz says today's producers do a better job of conservation, but "probably still not enough."

Schwartz has been in Abilene since 1948. He retired from the SCS in 1965 but remained as the executive director for the soil conservation district there for 19 years (Figure 4).

Schwartz was in the Air Force for 49 months but never got off the ground. Since his retirement he has traveled extensively, visiting North and South America, China, Europe, Singapore, Japan, Australia and New Zealand.

"I've known poverty, and I worked like hell till I retired," he says.

Editor's Note: This article was originally published in the Livestock Weekly on September 9, 1997. Ralph Schwartz was a true soil conservationist. Ralph died on February 21, 2004 in Abilene, Texas.

Colleen Schreiber is a staff writer for Livestock Weekly.

(Continued from Page 12—
Tumbling Tumbleweeds)

A consumer can also purchase full-grown tumbleweed skeletal remains for about \$55. Even more intriguing are the decorated and dressed-up tumbleweeds that can be purchased and customized for holidays, too. If you are so inclined, you can purchase “mechanically-separated tumbleweed parts” that are “road-kill.” Technically, the tumbleweeds were hit by a vehicle on the road and the pieces are now available for purchase at a discounted price of about \$10 – road-kill *tumbled* weeds! I’m not sure what to say other than...

*Tumbling tumbleweeds...
See them tumbling down,
Pledging their love to the ground...
I'll keep rolling along...tumbling tumbleweeds.**

Yes, they will.

**Song lyrics written by Bob Nolan, and performed and made famous by Roy Rogers and the Sons of the Pioneers in 1933.*

Melissa Sturdivant is a Soil Conservationist with the USDA-NRCS in Goldthwaite, Texas, and serves as the Co-Editor for the Reverchon Naturalist.

WHAT IS CONSERVATION ?

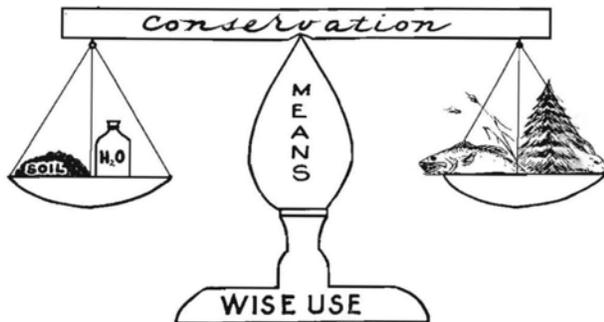


Image credit: Kansas School Naturalist. Vol. 11, No. 3, February 1965. Kansas State Teachers College of Emporia. Emporia, Kansas.

See anything happening on your Texas rangeland? Articles and photos related to the flora and fauna of our native landscape are welcome. We’d really like to hear from you; please share what’s happening in your part of the state.

Send your 300 to 500-word essay to Ricky Linex at ricky.linex@tx.usda.gov and Melissa Sturdivant at melissa.sturdivant@tx.usda.gov

Melissa Sturdivant

(Continued from Page 8—
Days of Dust: The Legacy from the Dust Bowl)

The Civilian Conservation Corp and the SCS were the lasting legacy of the New Deal.

The worst of the dust storms was called Black Sunday and occurred on April 14, 1935. This storm was 100 miles wide and a mile high, and represented as much soil as was dug out of the Panama Canal during its seven years of construction. “It is human nature when things are going good that you think they will never go bad,” stated Timothy Egan.

Warning signs of an impending duster include: birds and animals fleeing ahead of the storm, and static electricity that would be strong enough to short out automobiles and knock people down.

Timothy Egan is an American writer and journalist. His 2006 masterpiece entitled, *The Worst Hard Time*, about the people who lived through the Great Depression’s Dust Bowl, earned Egan the National Book Award for Non-fiction and the Washington State Book Award in history/biography.

This excerpt of an article of the same title originally appeared in the *Reverchon Naturalist*, Issue 18, dated Nov-Dec 2012.

Ricky Linex is a Wildlife Biologist with the USDA-NRCS in Weatherford, Texas, and serves as the Co-Editor for the Reverchon Naturalist.

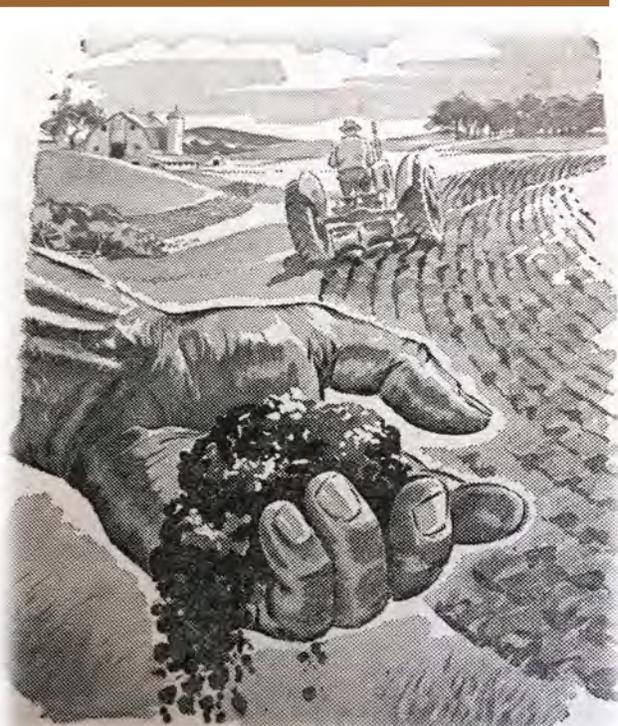
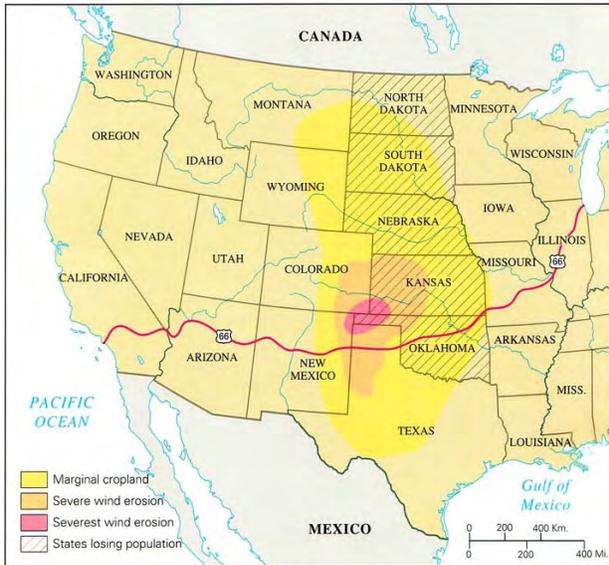


Image courtesy of: The Goldthwaite Eagle. May 23, 1963. Goldthwaite, Texas.



Map (above) and overlays detail the cropland states of the Great Plains, and the areas hardest hit during the Dust Bowl years.

Map source: <http://hoovervillehistory.tripod.com/id5.html>

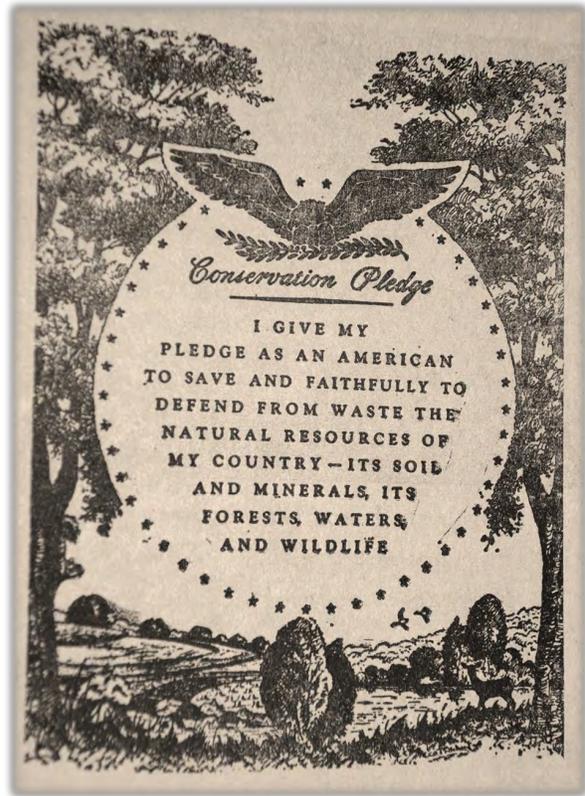
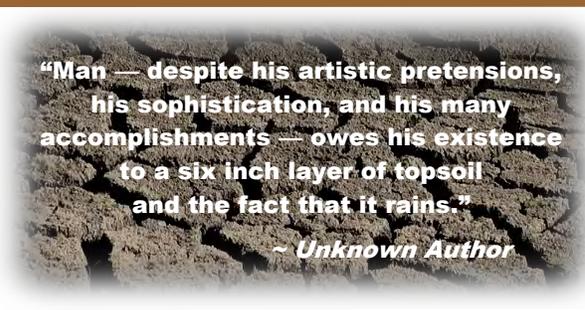


Image courtesy of: *The Goldthwaite Eagle*. May 7, 1970. Goldthwaite, Texas.



The conservation message is still strong and clear! Vintage 1959 commemorative US postage stamp promotes the soil conservation movement and encourages soil conserving farming practices still being used today. Photo credit: US Postal Service.



MARK YOUR CALENDAR

NATIVES AND PRAIRIE DAYS

May 2, 2015 • Bath House Cultural Center, White Rock Lake, Dallas, Texas

North Texas Master Naturalists are sponsoring this event at 521 E. Lawther Dr. in Dallas. For more info, refer to: <http://public.ntmn.org/native-plants-and-prairies-day>

FANNIN COUNTY WILDLIFE PROGRAM

May 8, 2015 • Bonham, Texas

For more info, contact Fannin Co SWCD, (903) 583-9513, Ext. 3, marvjane.godwin@tx.nacdnet.net

BRIT'S PRAIRIE DAY SATURDAY

May 16, 2015 • Botanical Research Institute of Texas, Fort Worth, Texas

For more info, refer to: <http://www.brit.org/events/Prairie%20Day>

PLANT APPRECIATION DAY

May 29, 2015 • Rolling Plains Quail Research Ranch, Roby, Texas

For more info, contact Dale Rollins, drollins@quailresearch.org

Send your calendar items to Ricky Linex at ricky.linex@tx.usda.gov and Melissa Sturdivant, at melissa.sturdivant@tx.usda.gov.