



Sand & Soapweed

Newsletter of the *Middle Niobrara Natural Resources District*



Nebraska's
Natural Resources Districts

40 YEARS

Protecting Lives, Protecting Property & Protecting the Future Since 1972



Nebraska has a proud history of planting trees. Arbor Day, an international holiday, was born here in 1872 by J. Sterling Morton.

Through the **NRD Conservation Tree Program**, since 1972 over 60 million trees and shrubs have been planted throughout the state for conservation purposes and help landowners plant more than a million trees each year in Nebraska.

Conservation trees and shrubs benefit people, animals and our environment. They shade and shelter homes, reduce energy costs, protect and increase crop yields, reduce soil erosion caused by water and wind, improve water quality, control snow and preserve winter moisture, protect livestock, provide

food and cover for wildlife, control noise, capture atmospheric carbon, raise property values, and add beauty to our landscape.

NRDs provide conservation tree and shrub seedlings and other services to Nebraska landowners most often to assist in establishing multiple parallel rows of trees and shrubs on their properties. The [Conservation Trees for Nebraska Handbook](#) is an excellent source of information when choosing tree and shrub species best suited to meet specific needs or desires.

NRDs offer a variety of conservation services to landowners in addition to providing seedlings. These services include planting design, site preparation, machine planting of seedlings, and installation of fabric weed barrier along plant rows. A variety of cost-share programs are available from NRDs and/or from state, federal and private conservation organizations offering limited funding for partial reimbursement of planting costs to landowners. Contact your local Middle Niobrara NRD at 402-376-3241 for more information.

2011 Nitrate Sampling Results

The 2011 Middle Niobrara water quality nitrate sampling season is complete. A total of 172 samples were collected and analyzed for nitrates during the summer months. This is the third highest number of samples collected since implementation of the groundwater management plan. The average concentration was 7.49 ppm and the median concentration was 3.45 ppm. The highest concentration sampled was 44.8 ppm in Keya Paha County, while the lowest concentration recorded was 0.1 ppm at several locations in Cherry County and 1 location in Brown and Keya Paha Counties. Overall nitrate concentrations are up from last year in each of the counties and the district. Attached to this report are graphical summaries of each of the counties and the district as a whole.

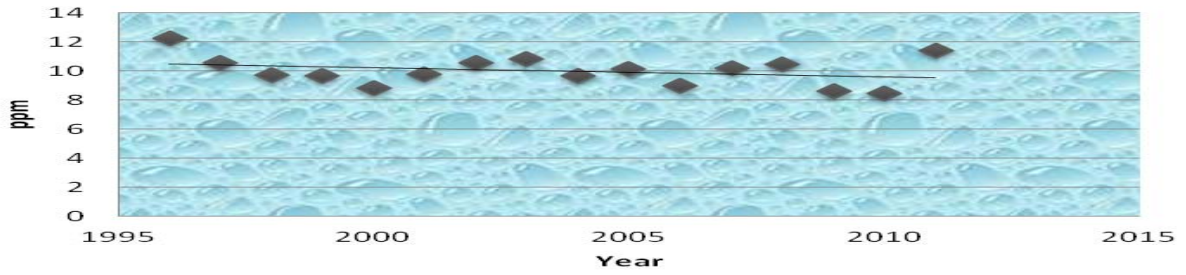
Sample Numbers by County

Cherry County: 53 samples
Brown County: 70 samples
Keya Paha County: 32 samples
Rock County: 17 samples

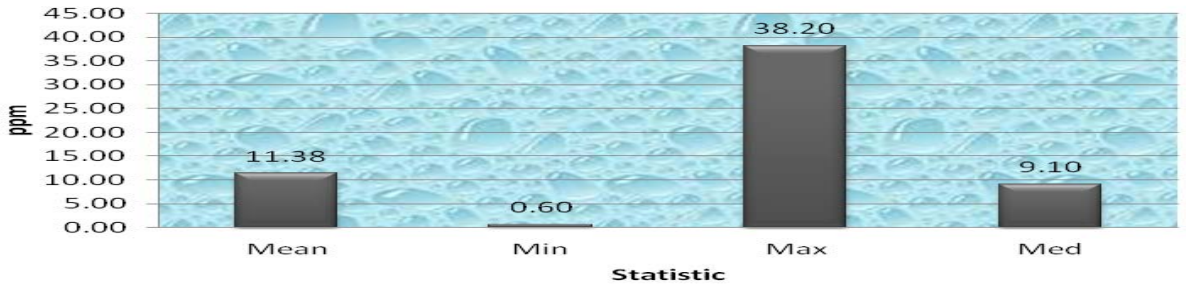
Explanation of Statistics

Mean = Average concentration
Min = Lowest concentration sampled
Max = Highest concentration sampled
Med = Half the samples above this concentration, half the samples below his concentration.

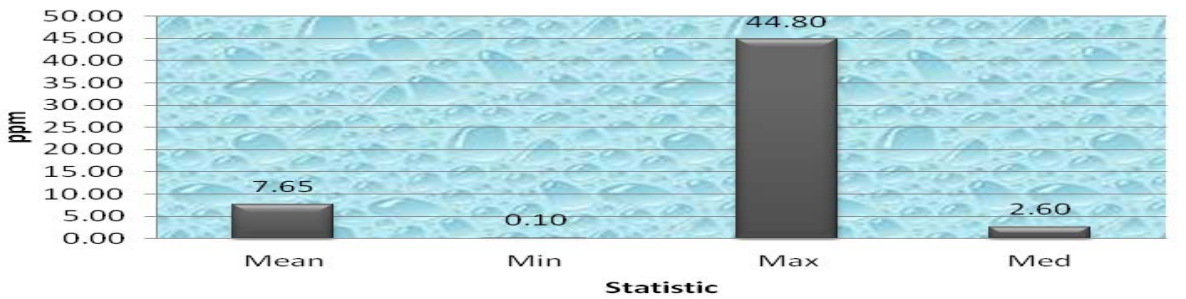
Rock County Trend



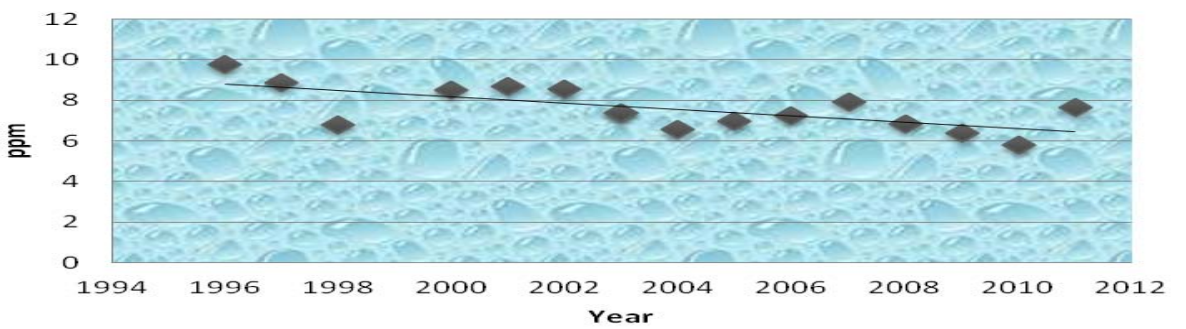
Rock County Nitrate Statistics



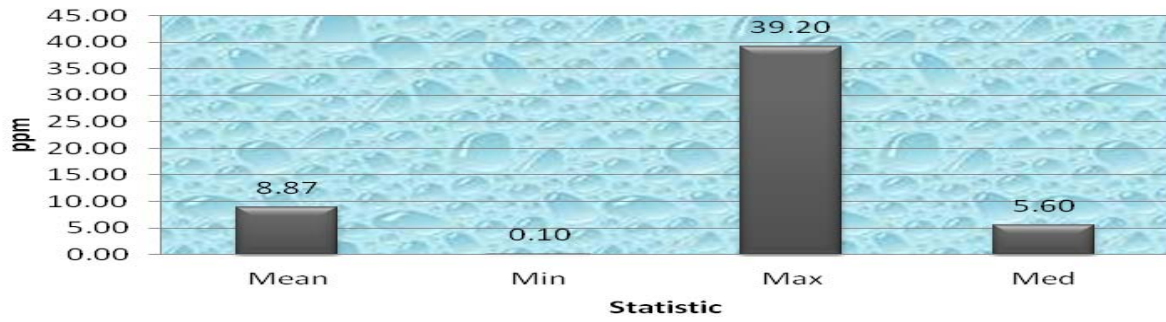
Keya Paha County Statistics



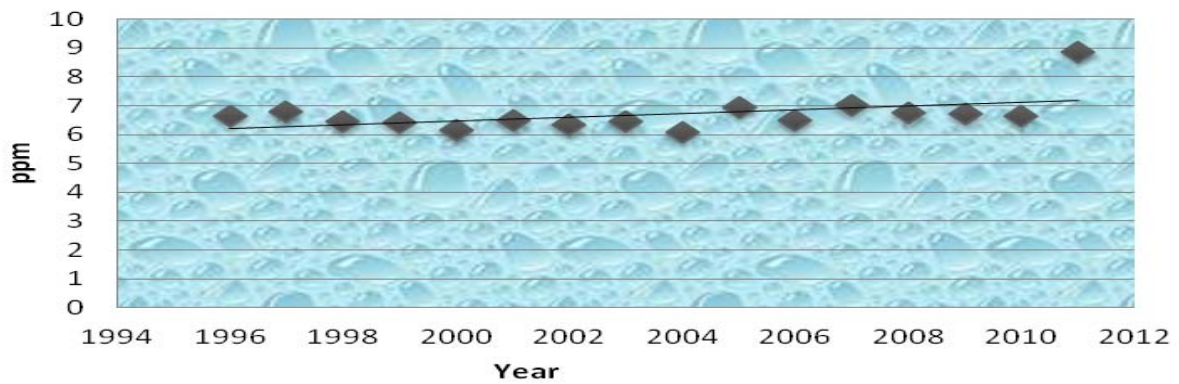
Keya Paha County Trend



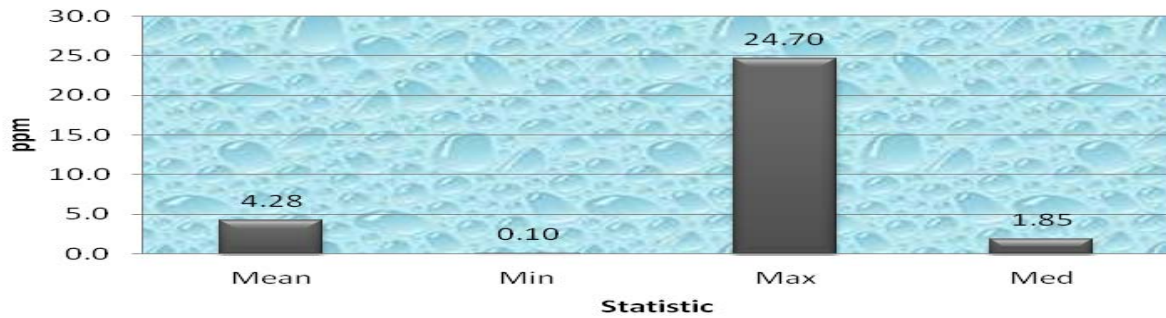
Brown County Nitrate Statistics



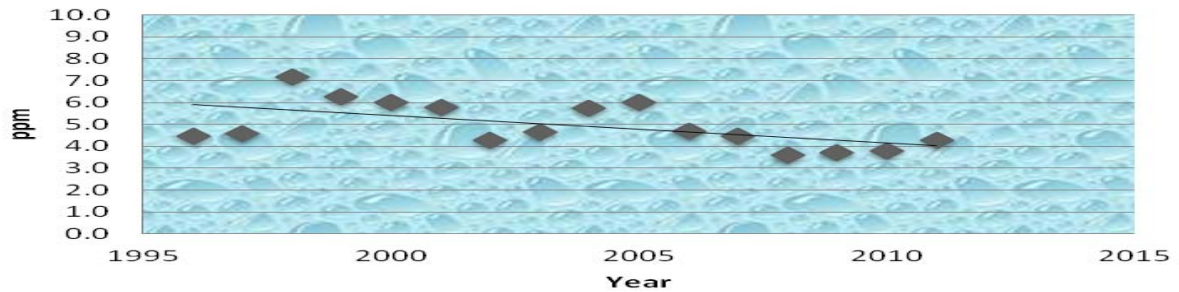
Brown County Trend

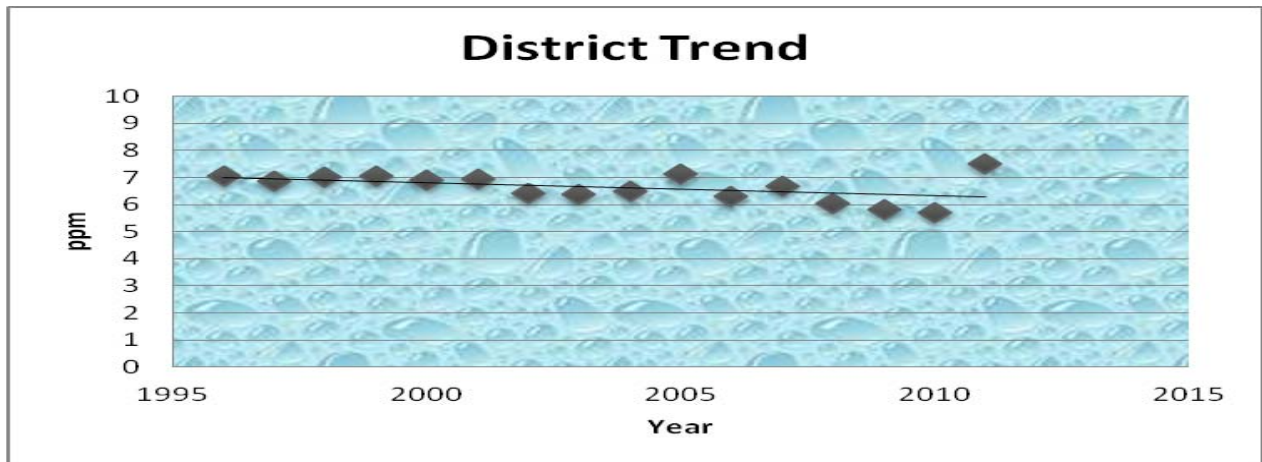
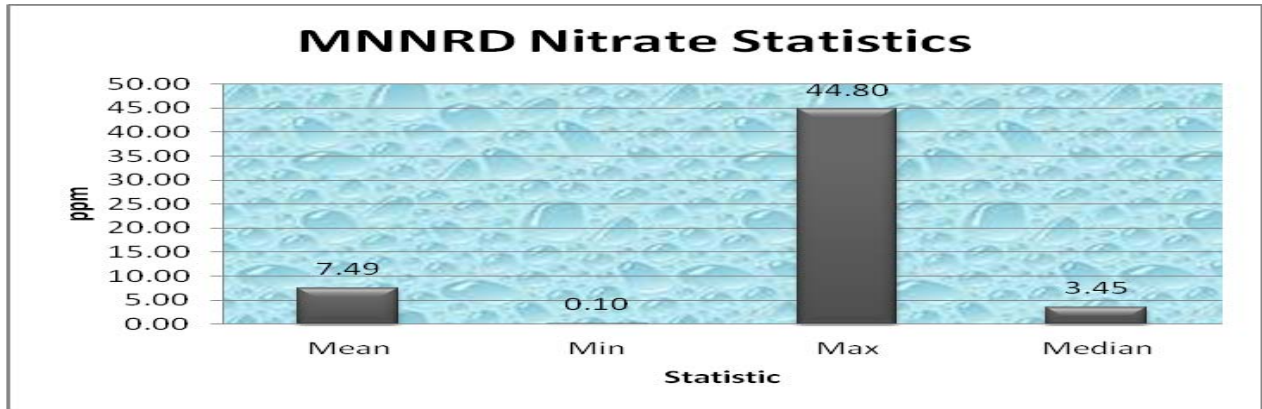


Cherry County Nitrate Statistics



Cherry County Trend





2011 Fall Static Water Level Report

A total of 101 wells were measured for static water levels this fall. 89 wells showed an increase from the fall of 2010, while 12 wells showed a decrease. The largest increase measured was 3.39 feet northeast of Kilgore and the largest decrease measured was 2.47 feet in Western Cherry County, 1.5 miles from our District Boundary. The average for the District was a .76 feet increase.

	<u>Brown</u>	<u>Cherry</u>	<u>Keya Paha</u>	<u>Rock</u>
Largest Increase	3.17 ft.	3.39 ft.	1.58 ft.	2.86 ft.
Largest Decrease	1.03 ft.	2.47 ft.	0.10 ft.	1.65 ft.
Average	0.83 ft.	0.83 ft.	0.36	1.14 ft.

Overall, Fall static water levels have increased from the 2010 measurements.

In 2011, Rock County has had the largest average increase in spring and fall measurements.



2011 Chemigation Report

358 total permits issued

47 new permits

310 permit renewals

184 inspected

6 re-inspected



Thousand Cankers Disease

Dieback and mortality of eastern black walnut (*Juglans nigra*) in several Western States have become more common and severe during the last decade. A tiny bark beetle is creating numerous galleries beneath the bark of affected branches, resulting in fungal infection and canker formation. The large numbers of cankers associated with dead branches suggest the disease's name—*thousand cankers disease*.

The principal agents involved in this disease are a newly identified fungus (*Geosmithia* sp. with a proposed name of *Geosmithia morbida*) and the walnut twig beetle (*Pityophthorus juglandis*). Both the fungus and the beetle only occur on walnut species. An infested tree usually dies within 3 years of initial symptoms.

Thousand cankers disease has been found in many Western States (figure 1). The fungus and the beetle have not been found east of the Great Plains. However, a number of factors suggest that this disease could establish in eastern forests: the widespread distribution of eastern black walnut, the susceptibility of this tree species to the disease, and the capacity of the fungus and beetle to invade new areas and survive under a wide range of climatic conditions in the West.

Disease Symptoms

The three major symptoms of this disease are branch mortality, numerous small cankers on branches and the bole, and evidence of tiny bark beetles. The earliest symptom is yellowing foliage that progresses rapidly to brown wilted foliage, then finally branch mortality (figure 2). The fungus causes distinctive circular to oblong cankers in the phloem under the bark, which eventually kill the cambium (figure 3). The bark surface may have no symptoms, or a dark amber stain or cracking of the bark may occur directly above a canker. Numerous tiny bark beetle entrance and exit holes are visible on dead and dying branches (figure 4), and bark beetle galleries are often found within the cankers. In the final stages of disease, even the main stem has beetle attacks and cankers.

***Geosmithia* sp.**

Members of the genus *Geosmithia* have not been considered to be important plant pathogens, but *Geosmithia morbida* appears to be more virulent related species. Aside from causing cankers, the fungus is inconspicuous. Culturing on agar media is required to confirm its identity. Adult bark beetles carry fungal spores that are then introduced into the phloem when they construct galleries. Small cankers develop around the galleries; these cankers may enlarge and coalesce to completely girdle the branch. Trees die as a result of these canker infections at each of the thousands of beetle attack sites.

Walnut Twig Beetle

The walnut twig beetle is native to Arizona, California, and New Mexico. It has invaded Colorado, Idaho, Oregon, Utah, and Washington where walnuts have been widely planted. The beetle has not caused significant branch mortality by itself. Through its association with this newly identified fungus, it appears to have greatly increased in abundance. Adult beetles are very small (1.5 to 2.0 mm long or about 1/16 in) and are reddish brown in color (figure 5). This species is a typical-looking bark beetle that is characterized by its very small size and four to six concentric ridges on the upper surface of the pronotum (the shield-like cover behind and over the head) (figure 5A). Like most bark beetles, the larvae are white, C shaped, and found in the phloem. For this species, the egg galleries created by the adults are horizontal (across the grain) and the larval galleries tend to be vertical (along the grain) (figure 6).

Survey and Samples

Visually inspecting walnut trees for dieback is currently the best survey tool for the Eastern United States. Look for declining trees with the symptoms described above. If you suspect that your walnut trees have thousand cankers disease, collect a branch 2 to 4 inches in diameter and 6 to 12 inches long that has visible symptoms. Please submit branch samples to your State's plant diagnostic clinic. Each State has a clinic that is part of the National Plant Diagnostic Network (NPDN). They can be found at the NPDN Web site (www.npdn.org). You may also contact your State Department of Agriculture, State Forester, Natural Resource District, or Cooperative Extension Office for assistance.



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