

Windbreak vegetation for odor management

(Editor's Note: This is the first in a series of two columns that will explain the importance of windbreaks on poultry farms. The second column will appear in the August edition of The Mid-Atlantic Poultry Farmer. For the full poultry air quality tech note, go to <http://www.plant-materials.nrcs.usda.gov/pubs/mdpmctn7166.pdf>)

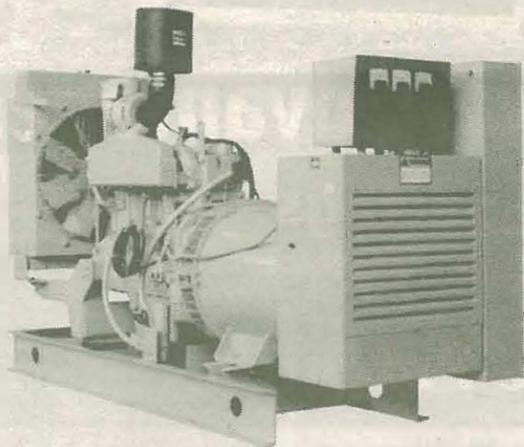
The U.S. poultry industry is the world's largest producer and second largest exporter of poultry meat. U.S. consumption of poultry meat (broilers, other chicken and turkey) is considerably higher than beef or pork.

Considering overall animal production in the United States, the total number of chickens per farm has increased considerably.

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WINDBREAKS



By Shawn Belt

Horticulturist
National Plant Materials Center

This national trend of producing more chickens on fewer farms is especially evident in the Mid-Atlantic. From 1982 to 2002, while the number of broiler chicken farms decreased by 11 percent, the number of birds produced increased by 54 percent in Delaware, Maryland and Virginia, according to the National Agricultural Statistical Service (NASS).

While poultry producers are increasing the efficiency of their operations, Mid-Atlantic states have been losing farmland, in most cases to development.

From 1997 to 2002, Maryland, Delaware and Virginia, on average, have lost 5 percent of their state's farmland.

This loss of farmland totals almost 300,000 acres. This trend of farmland loss is at a rate almost four times that of the nation as a whole. The encroachment of houses on farmland in the Mid-Atlantic,

combined with the trend toward more concentrated poultry operations, points to a much greater need for vegetative buffers.

Benefits of windbreaks/buffers Handling of odor and dust particles

Tree and shrub buffers absorb gaseous ammonia, precipitate out dust by slowing the air speed from exhaust fans, and deflect the odor plume into the atmosphere above the buffer, all in a very cost-effective way.

With odor management, the buffer becomes part of the overall management of the farm operation. Odor from poultry houses typically travels downwind, along the ground, in a concentrated plume. By planting trees and shrubs around poultry houses, farmers can disrupt the plume and mix it with the prevailing winds to dilute odor.

Ammonia is the gas of greatest concern to the poultry industry. Plants have the ability to absorb aerial ammonia.

This translates into higher grow rates, as plants located in front of exhaust fans were found to have higher amounts of nitrogen and dry matter weights compared to control plants.

Plant growth is increased with the right amount of ammonia; however there is a critical threshold where too much ammonia will cause tissue necrosis, reduced growth and great frost sensitivity. During the summer, trees reduced air velocity by 99 percent, dust by 49 percent and ammonia by 46 percent downwind the trees.

The direction of the wind strongly influenced these results; wind blowing toward the fans "increased" the efficacy of the buffer while wind blowing in the opposite direction "decreased" this efficacy.

Visual and noise barriers

The primary benefit from plant buffers installed near the poultry production facility is the improved visual perception of the facility, but they also can reduce noise by up to 50 percent.

This is extremely important to good neighbor relations where residential housing exists near poultry farms. These benefits are especially important in the Mid-Atlantic, with its booming housing market.

Other benefits

Windbreaks/buffers may also reduce the spread of specific infections.

See ODOR, Page 5

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Odor ...

Continued from Page 4

tious diseases in poultry operations by blocking, intercepting or diverting wind-borne infectious organisms away from buildings.

However, use care to select windbreak plants that do not produce large amounts of seed or fruits that attract birds, which may spread these diseases.

Fruiting can be avoided by using male cultivars of dioecious plants (e.g. hollies) or fruitless cultivars.

Windbreaks help filter and capture nutrients from runoff and ground water through root absorption of up to an estimated 80 percent of the nitrogen and phosphorus in certain environments.

Nutrient uptake by plants helps reduce the amount of nutrients that are available to enter adjacent water courses.

Windbreak/buffer design and maintenance

Plant selection will vary depending on the site. Select plants based on the following factors:

- mature height and spread of the plant
- soil type
- drainage and moisture conditions
- wind conditions
- precipitation
- USDA hardiness range

- growth rate
- whether it is a native or introduced species
- location and distance from exhaust fans
- farm layout (location of roads and neighbors)

To maximize particulate trapping, select plants based on the following factors:

- high leaf surface roughness (plants with leaf hairs, leaf veins and small leaf size)
- complex leaf shapes
- large leaf areas
- medium to rapid plant growth rates

The following is a list of plants that are proven to be effective windbreaks/buffers:

- honeylocust (*Gleditsia triacanthos* var. *inermis*)
- Nellie Stevens holly (*Ilex cornuta* x *aquifolium* 'Nellie Stevens')
- Japanese holly (*Ilex crenata* 'Steeds')
- American holly (*Ilex opaca*)
- eastern red cedar (*Juniperus virginiana*)
- Norway spruce (*Picea abies*)
- hybrid poplar (*Populus deltoides* x *nigra* 'Spike')
- Austree hybrid willow (*Salix matsudana* x *alba*)
- purpleosier willow (*Salix purpurea* 'Streamco')
- bald cypress (*Taxodium distichum*)

- 'Green Giant' arborvitae (*Thuja plicata* x *standishii*)
- Leyland cypress (x*Cupressocyparis leylandii*)

The following is a list of plants that could potentially be used as effective windbreaks/buffers:

- trident maple (*Acer buergerianum*)
- hedge maple (*Acer campestre*)
- boxelder (*Acer negundo*)
- red maple (*Acer rubrum*)
- Freeman maple (*Acer rubrum* x *saccharinum*)
- purpleblow maple (*Acer truncatum* hybrid)
- speckled alder (*Alnus rugosa*)
- hazel alder (*Alnus serrulata*)
- false indigo (*Amorpha fruticosa*)
- Siberian pea shrub (*Caragana arborescens*)
- sugar hackberry (*Celtis laevigata*)
- common hackberry (*Celtis occidentalis*)
- redbud (*Cercis canadensis*)
- ginkgo (*Ginkgo biloba*)
- Kentucky coffeetree (*Gymnocladus dioica*)
- possumhaw holly (*Ilex decidua*)
- inkberry holly (*Ilex glabra*)
- yaupon holly (*Ilex vomitoria*)
- Amur maackia (*Maackia amurensis*)
- osage orange (*Maclura pomifera*)

- dawn redwood (*Metasequoia glyptostroboides*)
- black tupelo (*Nyssa sylvatica*)
- hop hornbeam (*Ostrya virginiana*)
- Colorado spruce (*Picea pungens*)
- sycamore (*Platanus occidentalis*)
- London planetree (*Platanus x acerifolia*)
- sawtooth oak (*Quercus acutissima*)
- swamp white oak (*Quercus bicolor*)
- bur oak (*Quercus macrocarpa*)
- willow oak (*Quercus phellos*)
- chestnut oak (*Quercus prinus*)
- northern red oak (*Quercus rubra*)
- shumard oak (*Quercus shumardi*)
- Texas red oak (*Quercus texana* [syn. *Q. nuttallii*])
- black locust (*Robinia pseudo-acacia*)
- scholar tree (*Sophora japonica*)
- giant arborvitae (*Thuja plicata*)
- littleleaf linden (*Tilia cordata*)
- silver linden (*Tilia tomentosa*)
- American elm (*Ulmus americana*)
- smoothleaf elm (*Ulmus carpinifolia*)
- Japanese zelkova (*Zelkova serrata*)

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Festival ...

Continued from Front Page

"This industry, as many of you know, is the backbone of agriculture on the Delmarva Peninsula," Scuse said. "This is what agriculture is all about."

Federsburg Mayor Betty Ballas welcomed visitors, and officially opened the festival.

The festival featured rides on the Maryland & Delaware Railroad (between Federsburg and Hurlock), the giant fry pan, Chicken Capers games and education exhibits prepared by the University of Maryland and the University of Delaware.

"It was a great festival," said Connie

Parvis, director of education and consumer information for the Delmarva Poultry Industry Inc. and coordinator of festival planning between the host community and DPI. "The friendly people in Federsburg rolled out the welcome mat, attendance exceeded all expectations and the chicken was delicious. What a wonderful way to celebrate Delmarva's important chicken industry."

The festival has been held since 1948, when folks involved in Delmarva broiler production organized the event to help showcase the Chicken of Tomorrow contest. The contest moved to a different part of the country one year later, but organizers recognized the importance of the festival.

Next year's festival is scheduled for June 20-21 in Salisbury, Md.

CALIFORNIA CHICKEN SALAD

- 4 boneless, skinless chicken breast halves
- 3/4 cup reduced fat honey mustard salad dressing, divided
- 1 tablespoon orange juice
- 8 cups assorted salad greens
- 1 medium avocado, peeled, pitted, cut in lengthwise slices
- 1 orange, peeled, sectioned
- 1 cup strawberries, sliced
- 1/4 cup coarsely chopped walnuts, toasted

Place salad dressing in small container; add orange juice, stirring to mix. Remove 1/4 cup of the dressing to use as basting sauce; set aside remaining dressing.

Place chicken on prepared grill about 5 inches from heat. Grill, turning once and basting often, about 5 to 7 minutes per side or until chicken is fork tender and internal temperature registers 160 degrees. Place chicken on platter and slice horizontally into 1/4-inch slices; set aside.

On large platter, place salad greens. Arrange chicken, avocado slices, orange sections and strawberries over greens. Drizzle reserved dressing over all. Top with toasted walnuts. Makes 4 servings.

Courtesy of the Delmarva Poultry Industry Inc.