Approved: 1-28-97
Date

MINUTES OF THE HOUSE COMMITTEE ON ENVIRONMENT.

The meeting was called to order by Chairperson Steve Lloyd at 3:30 p.m. on January 22, 1997 in Room 526-S of the Capitol.

All members were present except: Rep. Vaughn Flora - excused
Rep. Kent Glasscock - excused

Committee staff present: Raney Gilliland, Legislative Research Department
Hank Avila, Legislative Research Department
Mary Ann Graham, Committee Secretary

Conferees appearing before the committee: Al LeDoux, Director Kansas Water Office
James J. O'Connell, Secretary of KDHE
Steve Williams, Secretary Wildlife and Parks
Tracy Streeter, Director State Conservation Commission
Dr. Marc Johnson, Dean, Kansas State University
Alice Devine, Secretary Department of Agriculture
Dale Lambley, Assist. to Secretary of Agriculture

Others attending: See attached list

The meeting was called to order at 3:30 p.m. by Chairman Steve Lloyd. The minutes of January 13, 14, 15, and 16 meetings had been distributed to committee members. The Chairman asked if there was a motion to approve the minutes. Rep. Phelps moved the minutes be approved, Rep. Myers seconded. Motion passed.

The Chairman recognized Rep. McClure. She asked if committee members had received a letter from the Kansas Geological Survey, they will be giving a tour this year concerning infrastructure, the dates are June 4, 5, and 6. She encouraged everyone to attend.

Chairman Lloyd briefed the committee on next week's agenda, the week of January 27.

The Chairman welcomed Al LeDoux, Director of the Kansas Water Office. Mr. LeDoux briefed the committee on the Governor's Water Quality Initiative. (See Attachment 1) This is a multi-agency initiative designed to protect and restore the quality of Kansas surface waters. Initial efforts will be concentrated in the Kansas-Lower Republican Basin, an area that stretches across 10,500 square miles of north-central and northeast Kansas. Once progress has been made in the Kansas Lower-Republican Basin, similar clean-up efforts will be undertaken in each of the state's eleven other river basins. Mr. LeDoux introduced members of the cooperating agencies, Secretary James J. O'Connell, Kansas Department of Health and Environment; Secretary Steve Williams, Kansas Department of Wildlife and Parks; Tracy Streeter, Director, State Conservation Commission; Secretary Alice Devine, Kansas Department of Agriculture and Dr. Marc Johnson, Dean, Kansas State University.

The Chairman welcomed Secretary O'Connell to the committee. Secretary O'Connell discussed the role and responsibilities his department has in the clean up effort and showed several transparencies of monitoring sites. He stated that the Governor's Water Quality Initiative is a long term project.

Secretary Steve Williams was welcomed by the Chairman. Secretary Williams spoke to the committee on his department's functions, one of which is biological monitoring and showed transparencies of the monitoring sites.

The Chairman welcomed Tracy Streeter, Director, State Conservation Commission Mr. Streeter explained the role his department has in the Initiative plan. He discussed funding for the program and showed transparencies explaining this. Discussion and questions followed.

MINUTES OF THE HOUSE COMMITTEE ON ENVIRONMENT, Room 526-S Statehouse, at 3:30 p.m. on January 22, 1997.

Chairman Lloyd welcomed Dr. Marc Johnson, Dean, Kansas State University. He distributed information, Reducing Atrazine Runoff from Crop Fields, (See Attachment 2) from the Cooperative Extension Service to the committee. Also information Using Vegetative Filter Strips in Fields. (See Attachment 3) Discussion and questions followed.

The Chairman welcomed Alice Devine, Secretary of Agriculture. Secretary Devine showed a transparency of the Blue River Basin on the Kansas-Nebraska border. She discussed her Department's responsibilities and answered questions. She introduced a staff member of the Department, Dale Lambley to the committee. Time was spent questioning the staff members.

The Chairman thanked Mr. LeDoux and all of the staff members for their presentation.

The meeting adjourned at 5:10 p.m.

The next meeting is scheduled for January 23, 1997

HOUSE ENVIRONMENT COMMITTEE COMMITTEE
GUEST LIST

DATE: 1-22-97

NAME	REPRESENTING
GREG A. FOLEY	SCC
John McIntyre	Post Audit
Dick Dibsaeer	Coleman
Al LeDoux	KWO
Marc Johnson	K-State
Jan Clowell	KDHE
Tram Sluter	SCC
Dale Lambley	KDA
Allie Devine	Ks. Dept. of Ag
STEVE WILLIAMS	KDWP
Steve Adams	KDWP
Annette Lown	KU student
Cindy Deaton	Div of Budget
BILL R. FULLER	Kansas Farm Bureau
Doug Wareham	Kansas Fertilizer & Chem Assn.
Lee Gerhard	Kansas Geological Survey
Ed Rowe	LWVKs
SUE PETERSON	K-State
Jamie Clover Adams	Governor's Office

HOUSE ENVIRONMENT COMMITTEE COMMITTEE
GUEST LIST

DATE: 1-22-97

NAME	REPRESENTING
Tom Bruno	Allen & Assoc.
Karl Mueldener	KDHE
Bill R Brown	Ottawa Co. Farmer - Salt Creek Watershed
Charles Benjamin	KNRC/Sierra Club-KS

he Governor's Water Quality Initiative is working because:

- *It fosters partnerships between the public and private sectors*
- *Financial and technical assistance is targeted to areas of greatest priority using incentives to promote voluntary adoption of best management practices*
- *Communication is increasing community awareness of the issues*
- *Regular meetings among the state agencies promote a high level of information exchange*

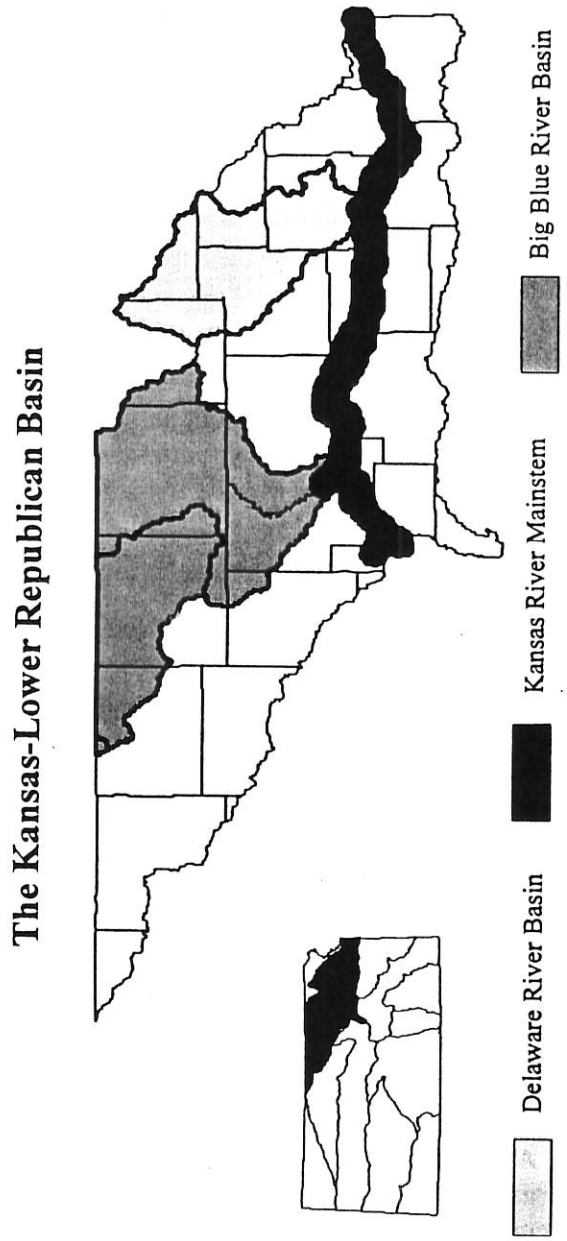
If you would like to learn more about the ***Governor's Water Quality Initiative,*** or would like information on any aspect of Kansas water and related land resources contact:

The Kansas Water Office
109 SW 9th St
Topeka, KS 66612-1249
913-296-3185
FAX 913-296-0878
e-mail ctv@fog.kwo.state.ks.us

OR

Toll-free 1-888-KAN WATER
(1-888-526-9283)
In Topeka, 296-3188

Visit the KWO Web Page at
http://www.ink.org/public/kwo



The State of Kansas

The Governor's Water Quality Initiative

A Water Quality Protection Plan For The Kansas-Lower-Republican River Basin In Northeast Kansas

Cooperating Agencies
Kansas Water Office
Kansas Department of Agriculture
Kansas Department of Health and Environment
Kansas Department of Wildlife and Parks
State Conservation Commission
Kansas State University

August 1996

House Environment
1-22-97
Attachment 1

On October 19, 1995, Governor Bill Graves announced a multi-agency initiative designed to protect and restore the quality of Kansas surface waters. Initial efforts will be concentrated in the Kansas-Lower Republican (KLR) Basin, an area that stretches across 10,500 square miles of north-central and northeast Kansas.

The Governor's Plan is incentive-based, relying on local voluntary efforts, enhanced public awareness, technical and financial assistance and appropriate monitoring and evaluation of programs, practices, participation and pollutants.

The focus of the Plan in the KLR basin is on the three major pollutants in the drainage area: **sediments**, the crop herbicide **atrazine** and fecal **coliform bacteria** found in human and animal waste. Prevention and remediation efforts are to be targeted so as to concentrate resources on the three priority pollutants and within those geographic areas which are producing disproportionate loads of these pollutants.

Water quality data indicate that the **Delaware River, Big Blue River and the Kansas River** mainstem corridor (Junction City to Kansas City) contribute the highest levels of contaminants, and, thus, will be the focus of attention in the initial stages of the Water Quality Plan.

The Plan will take the combined resources of state agencies, industry, municipalities and agriculture to reduce levels of principal pollutants in the basin. Related industries, associations and property owners are **partners** in the planning and conduct of programs.

A potential hurdle in this effort is the historic rifts among rural, urban, and environmental interests over pollution issues. State agencies are developing coalitions among these interests to help establish the strategy for pollution reduction. Further, the agencies communicate openly with appropriate interests, updating them on program development and seeking advice on future activities.

> ***The quality of the state's water can be improved. By educating everyone from farmers, ranchers and business owners, to children, parents and outdoor enthusiasts, we're convinced we can achieve voluntary participation rather than more intrusive regulatory compliance.***
>
> **Gov. Bill Graves**

Both **technical and financial assistance** will be made available to property owners, in addition to cost-share programs designed to address various environental practices. We're convinced this can be accomplished using existing funds. The main instrument for implementation comes from the **state water plan fund,** from which the state has earmarked **over $2.4 million for FY 1997.** Whenever possible, state funds are to be used to leverage outside funding for activities that will achieve the goals of pollution reduction. **In FY 97, almost one million dollars of additional state and federal funds** are anticipated to be targeted into the KLR basin.

An expanded pollutant monitoring network will measure the plan's success, with most water quality improvements likely to be noted over the long term (i.e., more than five years from now). *The critical short-term measure of success will be the extent to which localities participate in the program and develop local pollution management plans for use by the state agencies.*

From the start, state agencies involved in the program have made it a top priority to avoid "turf" battles and to work together in a cooperative and coordinated fashion. The Governor has played a vital leadership role by making this program a major agenda item for his administration, by directing state agencies to cooperate, and by emphasizing the use of incentives and partnerships. Although many ideas for pollution reduction were already in place, it is the strong direction from the Governor's office that put those ideas into motion.

Once progress has been made in the Kansas Lower-Republican Basin, similar clean-up efforts will be undertaken in each of the state's eleven other river basins. Much of the success, however, will depend on education and public participation.

Water is something that has a daily impact on all our lives. The quality of the state's water can be improved. By educating everyone from farmers, ranchers and business owners, to children, parents and outdoor enthusiasts, we're convinced we can achieve voluntary participation rather than more intrusive regulatory compliance. *It's important we take steps now to clean up and protect one of this state's most valuable and irreplaceable resources - our water.*

REDUCING

ATRAZINE RUNOFF FROM

CROP FIELDS

Atrazine herbicide has been used widely in Kansas since the 1960s for selective control of broadleaf and grass weeds in corn and grain sorghum.

Atrazine is one of the lowest cost herbicides on a per-acre basis. It provides effective weed control when applied to fields under a wide range of tillage practices. Unlike most herbicides, atrazine has wide application flexibility. It can be applied early preplant, preplant incorporated, preemergence, or postemergence.

There are concerns about atrazine runoff into surface water used as sources for drinking water. Kansas State University research has found a number of management strategies that producers can use to reduce the runoff of atrazine from their crop fields. ❖

Cooperative Extension Service
Kansas State Uni[illegible]

10 Best Management Practices For Atrazine

1. Incorporate atrazine into the top 2 inches of soil.

If you use tillage prior to planting corn or grain sorghum, consider applying atrazine (also tankmixes with *Lasso*, *Dual, Frontier*, *Surpass*, or *Harness* herbicides) preplant and incorporating it into the top 2 inches of soil with a field cultivator, tandem disc, or other appropriate tillage implement. Avoid deep incorporation. Mechanical incorporation of atrazine guarantees that less product will be at the soil surface where it will be most vulnerable to runoff. Incorporation will reduce runoff losses by approximately **67 percent** compared to surface application without incorporation.

> "All atrazine must be applied before corn or sorghum height exceeds 12 inches."

2. Change the time of application.

The potential runoff of atrazine can be decreased **50 percent** by applying atrazine prior to April 15 compared to applications in May and June. This results from the rainfall pattern in Kansas in which there are less intense storms in March and early April than in May and June, resulting in 50 percent less water runoff and, therefore, 50 percent less atrazine runoff. This is an excellent strategy, particularly for no-till fields, where preplant incorporation and some of the other management practices discussed below may not be appropriate. Following atrazine application, gentle rains are needed to wash the herbicide off plant residues and move it into the topsoil, where it is less likely to be lost in runoff water. Both rainfall amounts and storm intensities are less in March and April than in May and June. KSU researchers are currently examining the potential for applying atrazine in the fall prior to spring planted corn and grain sorghum to further reduce spring runoff losses of atrazine.

3. Use split applications of atrazine.

Apply atrazine and tankmixes as split applications, for example, one half to two thirds in March and half to one third just prior or immediately following planting. This has the potential to reduce atrazine runoff by **25 to 33 percent** compared to applying all the atrazine at planting time.

4. Reduce soil-applied atrazine application rates.

There is a direct relationship between atrazine rate and runoff. The lower the rate applied, the lower the potential atrazine runoff. Using lower atrazine rates and/or formulations with low atrazine content can still provide excellent control of pigweed and other small-seeded broadleaf weeds. For example, *Bicep Lite* is a formulated premix of atrazine and *Dual* that at normal use rates, contains about 1.0 pounds per acre atrazine. Both the *Dual* and the atrazine in this mixture contribute to pigweed and annual grass control. Other acid amide herbicides (*Lasso, Harness, Frontier, Ramrod, or Surpass)* also contribute substantially to pigweed control. Reducing atrazine rates by one-third potentially reduces atrazine runoff by **33 percent**.

Soil-applied Herbicide Premix	Amount of Atrazine (lbs/acre) at Normal Use Rate*
Bicep	1.6
Bicep Lite	1.0
Harness Xtra 5.6	1.5
Guardsman	1.2
Surpass 100	1.2
Ramrod/Atrazine	1.3
Lariat/Bullet	1.5

* On medium-textured soils

5. Use postemergence atrazine applications.

Postemergence mixtures that contain low rates of atrazine have been widely accepted by Kansas farmers. Products fitting this description are *Buctril & Atrazine* (bromoxynil plus atrazine), *Marksman* (dicamba plus atrazine), *Laddok* (bentazon plus atrazine), *Shotgun* (2,4-D plus atrazine) and *Contour* (imazethapyr plus atrazine for imidazolinone-resistant corn). These products typically contain only about 0.5 pounds per acre of atrazine. Atrazine use at this low rate has few soil texture limitations. Using these postemergence applications results in **67 percent** less atrazine runoff compared to typical preemergence soil-applied atrazine applications, and provides for better control of the tough, large-seeded broadleaf weeds such as velvetleaf, common cocklebur and common sunflower.

Soil-applied Herbicide Premix	Amount of Atrazine (lbs/acre) at Normal Use Rate
Buctril & Atrazine	0.5
Marksman	0.5
Laddok	0.5
Shotgun	0.5
Contour	0.5

6. Use reduced soil-applied application rates followed by a postemergence atrazine application.

Applying reduced soil-applied rates of approximately 1 pound per acre atrazine at planting time followed if necessary by a postemergence atrazine application results in **25 percent** less atrazine runoff compared to surface applying all atrazine at planting time while generally providing excellent broadleaf weed control. Such a two-step approach of using preemergence plus postemergence herbicides has consistently provided the best weed control over the broad spectrum of grass and broadleaf weeds in corn and grain sorghum.

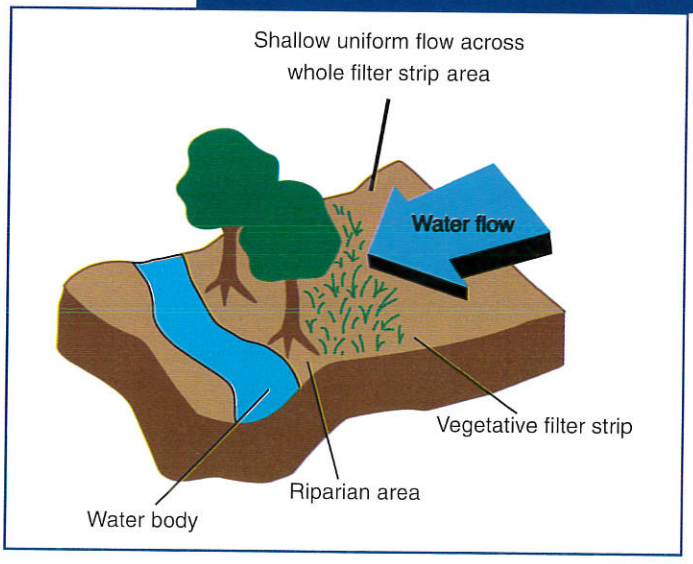
> "A two-step herbicide program based on a low rate of soil-applied atrazine, followed by a postemergence mixture often provides the best overall weed control in corn and grain sorghum."

7. Use alternative non-atrazine herbicides or non-chemical methods.

New herbicides not containing atrazine are becoming increasingly available, often through combinations of "old chemistry" such as 2,4-D, dicamba, or bromoxynil, with newer herbicides having the ALS-AHAS-inhibiting mode of action. These include *Resolve* (*Pursuit* plus *Banvel*), *Scorpion III* (*Broadstrike* plus *Stinger* plus 2,4-D), *Exceed* (*Peak* plus *Beacon*) and others. The use of crop rotations, cultivation, and other non-chemical weed control methods may reduce or eliminate the need for herbicides. Using non-atrazine alternative herbicides or non-chemical methods reduces atrazine runoff by **100 percent.** One should realize that just switching from atrazine to an alternative without using other improved management practices may result in just switching from atrazine runoff to runoff of the alternative herbicide.

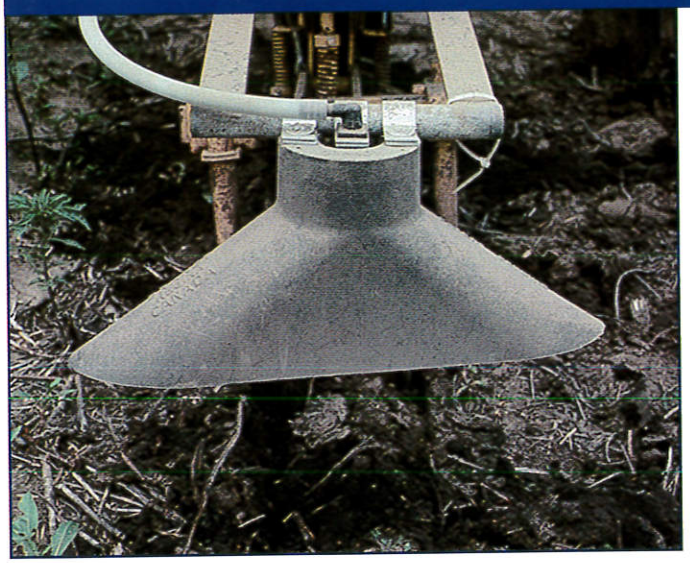
Alternative Herbicide Premix	Types of Weeds Controlled
Resolve	Broadleaf, some grasses
Scorpion III	Broadleaf
Exceed	Broadleaf, Shattercane Johnsongrass

8. Establish vegetative buffer strips.



Vegetative buffer strips that reduce water flow rate from the field can result in up to a **25 percent** reduction in atrazine loss from the field**.** These buffer strips include waterways, edges of fields, etc. It is important to realize, however, that the atrazine is not removed from the water when passing over a vegetative buffer strip. It is the proportion of atrazine-containing water that infiltrates into buffer strip soils that reduces atrazine loss from the field area.

9. Banding herbicides at planting or cultivation.



Banding the herbicide application over the row (for example, in a 10- or 15-inch band) reduces the total atrazine rate on a field basis by **50 to 66 percent**, with a corresponding reduction of atrazine runoff compared to a broadcast surface application without incorporation. This system works especially well for ridge tillage production and other situations where cultivation will be used.

10. Do not spray atrazine within 66 feet of where runoff enters a stream

Atrazine may not be applied within 66 feet of the points where field surface water enters streams. This restriction also applies to tile outlet terraces where 66 feet of untreated buffer must lie between the area of application and the stream. Without this buffer, a tile outlet terrace is a direct conduit for atrazine movement from the application site to the stream.

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KSU KANSAS STATE UNIVERSITY

Cooperative Extension Service, Kansas State University, Manhattan

MF 2208 April 1996

File Code: Environment and Pollution Control 9

MS 4-96—5M; 11-96—5M

Using Vegetative Filter Strips In Crop Fields

Department of Agronomy

Water runoff from crop fields often carries pollutants, such as soil sediments, nutrients, and pesticides, that can have adverse effects on water quality. One way to minimize this problem is through the use of vegetative filter strips. This bulletin explains the way pollutants move and the role of vegetative filter strips in reducing the amount of pollutants that leave a field.

How pollutants move

Soil sediments are physically transported by running water. As the rate of water flow slows, sediments settle out. For example, when silt-laden surface runoff encounters a terrace channel, the water usually slows as it flows along the gently-sloping channel. Sediments are deposited in a process called sedimentation, with the heaviest particles dropping out first.

Pesticides and nutrients that are strongly adsorbed by soils are transported and deposited in a similar manner. Herbicides such as trifluralin *(Treflan, Tri-4)*, for example, are tightly bound to soils and move almost entirely with soil sediments.

Nitrates and most herbicides, however, are not strongly adsorbed to soils and may be dissolved in runoff water. For example, atrazine, metolachlor *(Dual)*, alachlor *(Lasso)*, and acetachlor *(Harness, Surpass)* move mainly with the water. Practices that reduce sediment loss, but not water runoff, do not reduce losses of nitrate or herbicides that are dissolved in water.

Reducing sediment loss

Vegetative filter strips are generally planted to sod-forming grasses that help hold the soil in place, slow the runoff velocity, and provide some filtering action. Slowing the runoff velocity results in sedimentation. Larger soil particles tend to settle out readily. Finer clay particles remain suspended much longer and may require days to settle out, even in water that is not flowing.

Reducing loss of dissolved pesticides

Vegetative filter strips can remove herbicides (atrazine, for example) dissolved in runoff water to the extent that the water infiltrates into the underlying soil. If soil in the filter strip is already saturated when the runoff event occurs, there will be little or no further infiltration, with essentially no pesticide removal from the water. On the other hand, if the soil under the sod is dry, much greater infiltration may occur, which will reduce the amount of pesticide leaving the field.

Types of filterstrips

1. Grass Waterways (figure 1) are the most common type of vegetative filter strip in Kansas. These structures are designed to move water from terrace channels to lower field elevations without soil erosion. Sod-forming, cool-season grasses such as smooth brome or western wheatgrass usually line the channel.

In a well-designed and maintained system of terraces and waterways, most soil sediments settle out in the terrace channels, with some additional sedimentation in the waterway. This is a widely used and effective method to reduce soil loss.

Grass waterways are not very effective, however, for removing pesticides dissolved in runoff water. For one thing, the area of the entire field is usually many times greater than the area of the waterway. For example, if the surface runoff water from a 50-acre field drains through a 2-acre waterway, the area ratio is 25:1, and one would not expect much of the runoff water to infiltrate in such a small area. Furthermore, waterways usually follow the most direct route downhill, so are often quite steep. By design, waterways serve mainly as grass-lined conduits to move runoff water out of the field. There is little opportunity for water to infiltrate the underlying soil and little reduction in pesticide loads.

2. Filter Strip Terraces (figure 2) are strips of grass sod on the contour that surface water runoff crosses as it runs downhill. They are an alternative to earthen terraces, but have no

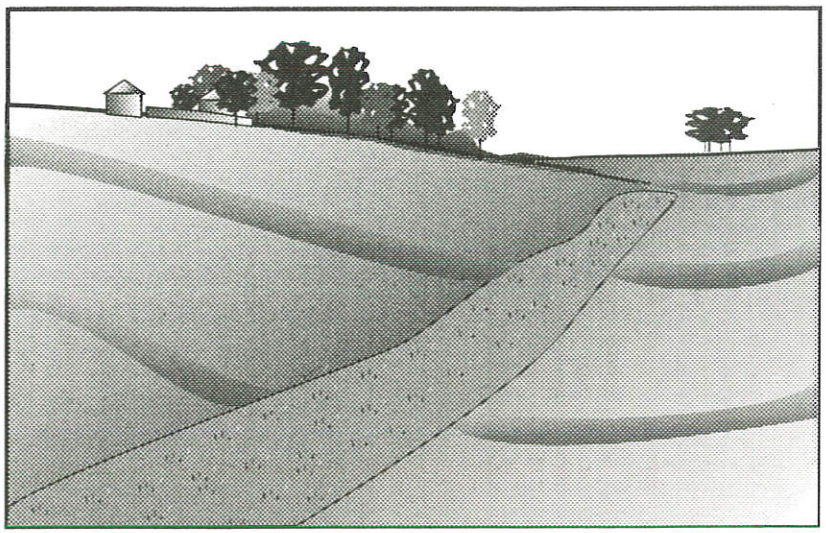

Figure 1. ***Grass Waterways*** *are the most common type of vegetative filter strip in Kansas.*

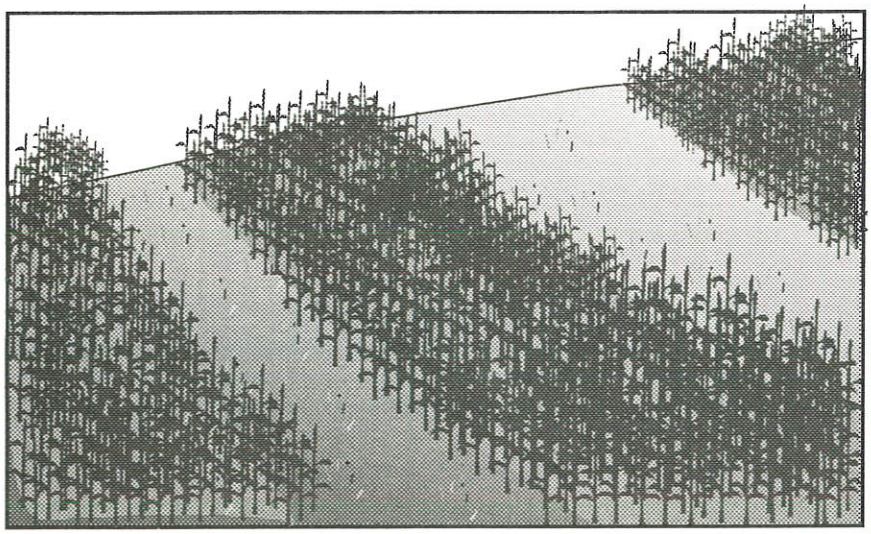

Figure 2. ***Filter strip terraces*** *are strips of grass sod on a contour that surface water runoff crosses as it runs downhill.*

channel to conduct water along the contour, as do earthen terraces. If water enters the filter strip terraces uniformly, in a shallow layer, then sediment trapping can be excellent.

Pesticide removal by filter strip terraces should be much better than by waterways because the ratio of watershed to filter strip area would be much less than for waterways. Research at the KSU Cornbelt Experiment Field in northeast Kansas showed that a 20-foot strip of smooth brome sod reduced the atrazine runoff from a 100-foot slope of no-till grain sorghum by 28 percent, averaged over five runoff events during the summer of 1992 (Marsh, 1994). The filter strip terrace also reduced sediments in runoff by 57 percent. Filter strip terraces are not common in Kansas.

3. Buffer Strips (figure 3) at lower elevations of fields, and **Riparian Strips** (figure 4) along stream banks intercept surface runoff water from crop fields. These might be ordinary grassed fence rows that runoff water crosses as it leaves fields, or strips of grasses, shrubs, and trees lining the banks of streams. For effective removal of soil sediments by these buffer strips, runoff water must flow in a shallow, even layer across the filter strip. Since these areas often have less slope than waterways or filter strip terraces, erect grasses such as bluestem and Indiangrass may provide better filtering than smooth brome or fescue.

Buffer strip/turn row combinations at the lower ends of ridge-tilled fields are ideal for treating surface water runoff. In such situations, small amounts of runoff water flow down each furrow, entering the buffer strip in a very controlled, systematic way. As with all vegetative filter strips, the

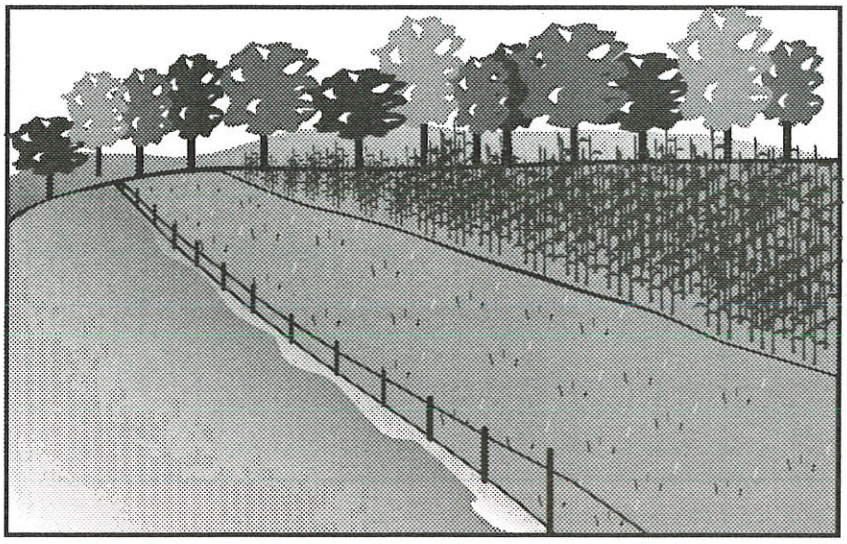

Figure 3. ***Buffer Strips*** *(at lower elevations of fields) intercept surface runoff water from crop fields.*

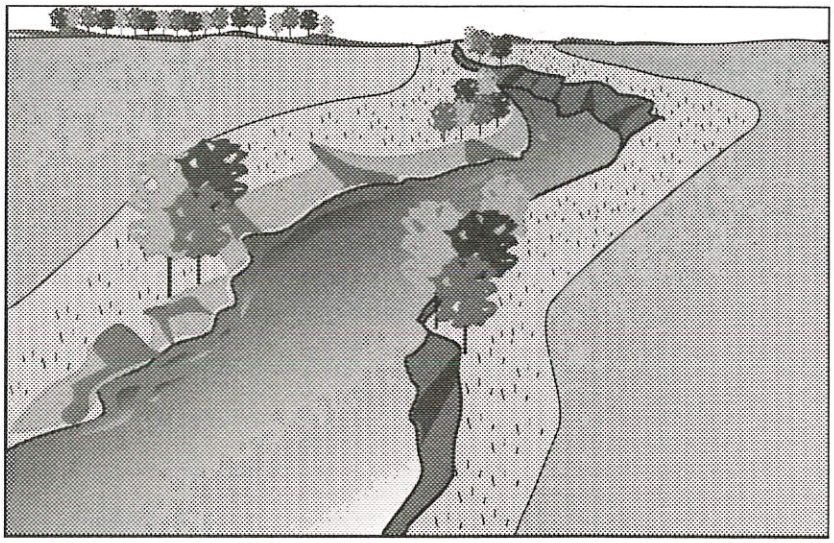

Figure 4. ***Riparian Strips****, along stream banks, intercept surface runoff water from crop fields.*

key to sediment deposition is to slow the water flow.

The extent to which buffer strips and riparian strips remove dissolved pesticides depends on the retention time of the water in the strips, and the amount of water infiltration into the soil. At KSU's Foster Site Field near Rossville, surface runoff water from a corn field was uniformly distributed over a 33-foot grass buffer area, planted to smooth brome, at the edge of the field. The grass buffer reduced the loss of herbicides by 50 percent. This demonstration system was designed to achieve very uniform distribution of the runoff water, a key to these high levels of pesticide reduction.

4. Settling Basins (figure 5) around inlets to tile-outlet terraces are especially effective at reducing soil sediment loads. These basins are usually planted as part of the field, but they could be planted to grasses and act as the setback zone for herbicides such as atrazine. Such basins are designed to retain water for up to 24 hours, giving most of the larger sediment particles time to settle out. Their effect on pesticide removal would be proportional to the amount of runoff water that infiltrates into the soils of the settling basin.

Summary

Well-designed and maintained vegetative filter strips of all types can be very effective in trapping and removing soil sediments from surface runoff waters. Simply reducing surface runoff velocity is sufficient to settle out larger sediments. On average, about 75 percent of soil sediments are removed in this way.

Removal of dissolved pesticides

requires that the runoff water infiltrate into the soils of the filter strips. For minor runoff events, the removal rate may be 100 percent if all runoff infiltrates into the soil of the filter strip. During prolonged rainy periods, infiltration may not occur at all after the soils become saturated. Data indicates that on average, only about 25 percent of the pesticide load is removed by filter strips designed for that purpose. Therefore, crop producers must use practices that retain the pesticides at the application site, and minimize pesticide loss through surface water runoff.

For more information on practices to reduce atrazine runoff, see K-State's Extension publication *Reducing Atrazine Runoff from Crop Fields* MF-2208 available at county Extension offices. For more information on grass waterways, see K-State's Extension publication *Grass Waterways Maintenance* MF-1064.

References: Marsh, B.H. 1994. *Conservation Tillage Research 1994*. Kansas State University Report of Progress 705, pg. 1-4.

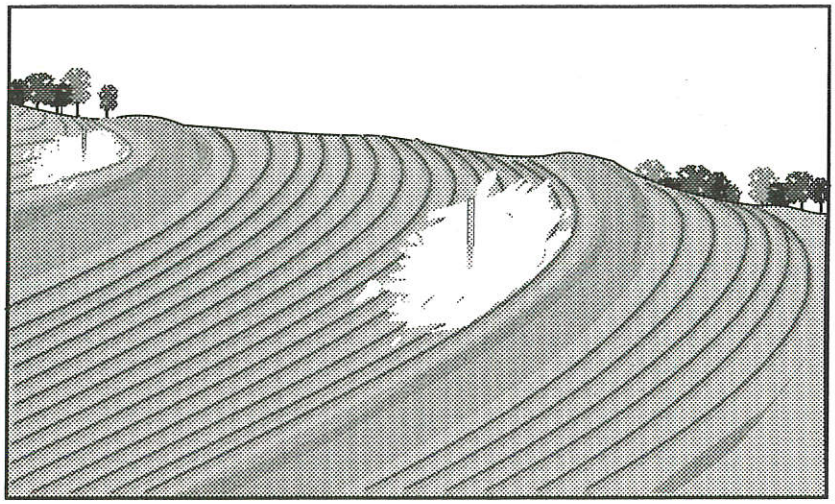

Figure 5: ***Settling Basins*** *around inlets to tile-outlet terraces are especially effective at reducing soil sediment loads.*

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Issued in furtherance of Cooperative Extension Work, acts of May 8 and June 30, 1914, as amended. Kansas State University, County Extension Councils, Extension Districts, and U.S. Department of Agriculture Cooperating, Richard D. Wootton, Associate Director. All educational programs and materials available without discrimination on the basis of race, color, national origin, sex, age, or disability.

July 1996

File Code: Crops and Soils 4-5 MS 7-96—5M