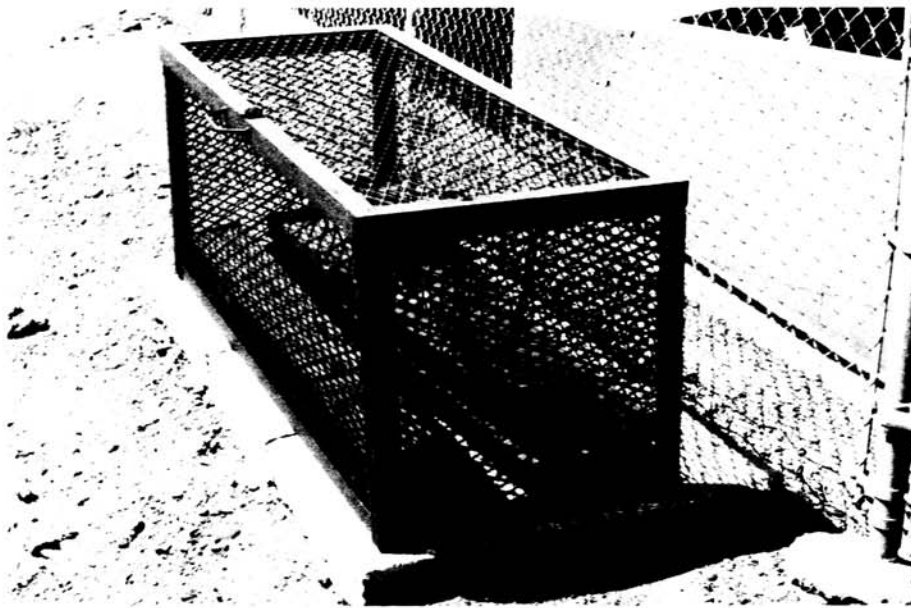


WATER OPERATION AND MAINTENANCE

BULLETIN NO. 133

SEPTEMBER 1985



IN THIS ISSUE

WEED CONTROL OPTIONS

STOPLOG BOX

"RISK MANAGEMENT" KEY TO PROGRESS AT IRRIGATION DISTRICT

WHY YOU SHOULD "MAKE IT CLICK"

WINTER DRIVING

**UNITED STATES DEPARTMENT OF THE INTERIOR
Bureau of Reclamation**

The Water Operation and Maintenance Bulletin is published quarterly for the benefit of those operating water supply systems. Its principal purpose is to serve as a medium of exchanging operation and maintenance information. It is hoped that the reports herein concerning laborsaving devices and less costly equipment and procedures will result in improved efficiency and reduced costs of the systems for those operators adapting these ideas to their needs.

To assure proper recognition of those individuals whose suggestions are published in the bulletins, the suggestion number as well as the person's name is given. All Bureau offices are reminded to notify their Suggestions Award Committee when a suggestion is adopted.

* * * * *



Division of Water and
Land Technical Services
Engineering and Research Center
P O Box 25007
Denver CO 80225

Cover photograph:

Stoplog box used to store stoplogs when not in service.

Any information contained in this bulletin regarding commercial products may not be used for advertisement or promotional purposes and is not to be construed as an endorsement of any product or firm by the Bureau of Reclamation.

WATER OPERATION AND MAINTENANCE
BULLETIN NO. 133

SEPTEMBER 1985

INTRODUCTION

The article on page 1 includes tips for carrying out a good bindweed control program.

Do you have a problem with storing your stoplogs? If so, the article on page 3 may help you with your problem.

The problem of financing infrastructure expansion to meet present and projected needs of a growth area is discussed in the article on page 5.

Some answers to your questions about safety belts are included in the article beginning on page 8.

To make your winter driving safer, follow the tips in the article "Winter Driving," on page 11 to help see and be seen in snow, fog, and rain.

WEED CONTROL OPTIONS

Persistence and keeping an eye on weed growth and rainfall are keys to carrying out a good bindweed control program in Oklahoma wheat fields.

"To get good control of bindweed you must settle on a program and stay with it," said Howard Greer, Extension Weed Control Specialist at Oklahoma State University.

"Because this weed's hard seeds germinate over several years, it's best to try to kill roots in the fall with translocated chemicals such as Banvel and Roundup," he explained. "This gives you a good start on a control program, but it depends on having enough moisture to cause the bindweed to resume growth."

Greer said if fall is extremely dry through frost it's best to skip Banvel and Roundup control programs that year, because "it just doesn't make sense to use an expensive treatment that will not provide control."

If there is rainfall, however, the specialist said there is no better way to kill the maximum number of deep perennial roots.

Also, there is now an approval for Tordon, for late spring use after wheat harvest.

Producers have several choices, however, and these include:

2,4-D

Applications of 2,4-D have been effective at the six to eight inch runner stage, bud or early bloom stage, if bindweed is growing vigorously. Many researchers feel in a continuous wheat cropping system, it is best to work the land once or twice, then allow at least three weeks for bindweed regrowth to reach the appropriate stage before applying 2,4-D. It is also necessary in many situations to apply 2,4-D in the spring when the bindweed is in the bud stage, which would be early or mid-May most years in Oklahoma. The time of the year is not nearly as important as the vigor and stage of the growing plants. The May application would be at the dough stage of wheat in most years. If wheat was grazed out or plowed up, this provides an excellent opportunity to treat the bindweed at the right stage of growth.

Repeat applications are made as often as plant regrowth occurs and the proper stage of growth has been reached. Seventy-five to 80 percent control has been obtained when two annual applications were made over a period of three years. A more effective program would probably involve use of 2,4-D along with tillage practices or in combination with Tordon rather than using the herbicide alone.

TORDON + 2,4-D

Use of a mixture of Tordon 22K and 2,4-D amine between crops of small grains has been approved under a 24(C) state label for use in Oklahoma. The addition of the Tordon increases bindweed control over that of 2,4-D alone. This mixture should be applied soon after harvest. Do not work the land until the herbicide has been on the bindweed a few days to allow translocation into the root system.

Reprinted by permission of the Farmer-Stockman Publishing Company, copyright 1985.

If you do not plan to harvest wheat, this gives you an excellent opportunity to apply the mixture at the right stage of bindweed growth. It is best to let the bindweed plants get runners at least six to eight inches long so that there will be adequate leaf area at the time of treatment.

BANVEL

Banvel has been used effectively in the fall after rainfall has occurred and bindweed starts to grow again. It can also be used after harvest if good moisture is available. For best results, make application during or after late bud to flower stage. Some crop injury may occur in wheat if the interval between application and planting is less than 45 days per pint of product used per acre. This means if Banvel is used late in the fall when conditions are often good for application, some wheat yield reductions can be expected that year. Field bindweed starts in small patches that keep enlarging. Banvel works well for treatment of these patches throughout the field to kill the bindweed and stop its spread over the field. Banvel 5G is also approved for use in Oklahoma. This may be a useful formulation for producers who have patches of bindweed starting in their fields but do not have sprayers to apply liquids.

ROUNDUP

Roundup is a foliar-applied, translocated herbicide that has no soil activity. It is an available herbicide for control of many perennial weeds including field bindweed. Since it does not have soil activity, it can be used for bindweed treatments in the fall with no risk of injury to wheat planted later on the treated area.

Roundup works best on bindweed when it is in the flowering or fruiting stage. Bindweed should be allowed to grow undisturbed for at least six weeks prior to the applications of Roundup. For best results, bindweed should be treated with Roundup after mid-August in most seasons, but before frost. Earlier treatments have not given consistent performance as often as these later applications. Late September and early October applications have usually provided the best root kills.

Bindweed must be actively growing in soil which has been moist for at least two weeks prior to applications. Plants which have grown under dry conditions may not respond to Roundup due to thick, waxy deposits which build up on the leaves under dry conditions. Consequently, sufficient time must be allowed after rainfall for new leaves to form under moist growing conditions.

BANVEL + ROUNDUP

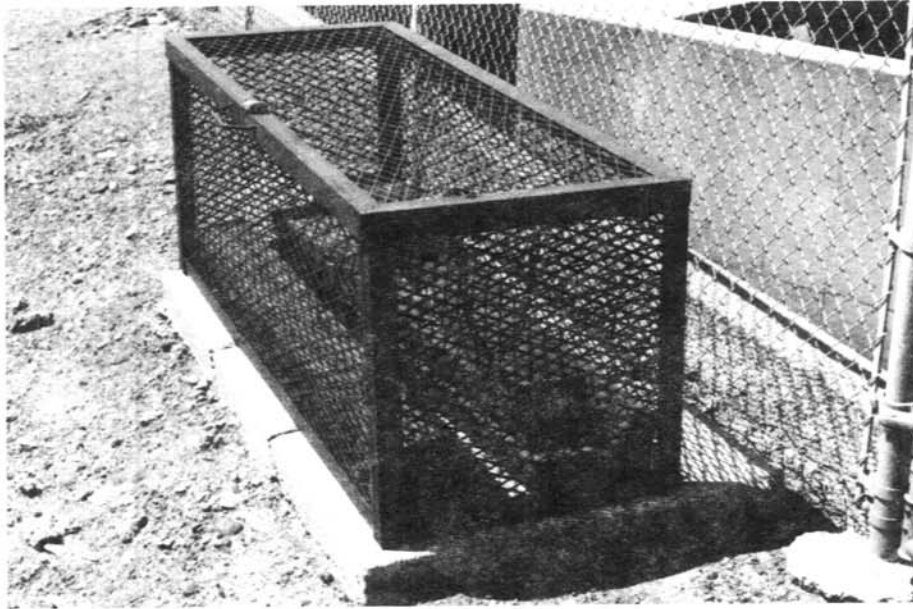
A tank mixture of Roundup plus Banvel is labeled at a rate of two quarts of Roundup and one pint of Banvel per acre. The reasons for this mixture are: (1) to cut cost from that of Roundup alone and (2) to reduce the carry-over of Banvel to the next crop. Burndown with this mixture is good, but root kill may not be as good a year later as with the full rate of either herbicide alone. However, in a good control program where follow-up practices will be done each year, this mixture could be useful to provide full wheat yield (no reduction from high rates of Banvel) and reduced costs of Roundup because the rate is half the full rate used alone without the Banvel. The following year Banvel could be used again or a producer could switch to 2,4-D or 2,4-D + Tordon. For more information on bindweed control contact your county extension office. This will provide you with more details about the different alternatives available to you.

* * * * *

STOPLOG BOX

Do you have a problem with storing your stoplogs? Are your stoplogs being stolen, used for firewood, or rotting where stored on the ground? If you are experiencing any of these situations, the photographs below show a stoplog box which may help you with your problems.

The stoplog box in the photographs is constructed of heavy metal and steel mesh. The lid has a safety chain and is provided with lock protection. The box sets on a base of precast concrete blocks to keep the metalwork off of the ground.



The information and photographs for this article were contributed by Gordon Johnston, O&M Specialist, Sacramento, California.



Since installation of the stoplog box shown in the photographs, very little loss and vandalism have been experienced on the box itself and the stoplogs.

* * * * *

"RISK MANAGEMENT"
Key to Progress at Irrigation District

Paul T. Converse, Senior Engineer,
El Dorado Irrigation District,
Placerville, California

The problem of financing infrastructure expansion to meet the present and projected needs of a growth area is being addressed by a policy that El Dorado Irrigation District Manager Mike Kenny terms "Risk Management." If not revolutionary, this is minimally a major evolutionary step for the district. Risk management, as Kenny explains it, is the willingness of the district and its board of directors to commit themselves to coping with future uncertainties and guarantee that important services will be provided as needed for the community.

Contrary to what its name might suggest, the El Dorado Irrigation District (EID) is a multi-function public utility. It provides sewer service, domestic and agricultural water, hydro-electric power generation, and outdoor recreation facilities within a 135,000-acre (over 200 square miles) area roughly half way between Sacramento and Lake Tahoe in the Sierra Nevada Foothills.

Lying as it does in the scenic Sierra Nevada Foothills within commuting distance from Sacramento, the district has experienced considerable growth in recent years and can look forward to a continuation of this trend as retirees and others seeking to escape the crowded Bay Area migrate to the foothills. This growth presents a major challenge to the district to expand its water and wastewater systems to keep pace.

Historically, as in most rural or semi-rural areas, the area around the district's headquarters has been the home of fiscally conservative people who believed that public services should be provided at the lowest possible cost, often at the expense of the long term needs of the area. As a consequence, many systems installed in recent years have become troublesome because of inadequate sizing or quality, as well as poor documentation. In some cases, systems were built by developers or others with narrow goals and were turned over to EID when problems overwhelmed them.

Unrelenting Growth

The district must now cope with the prospect of unrelenting growth, which it does not have system capacity to serve. The district must also deal with undersized extensions that cannot serve present demands, which should have been foreseen and provided for at the time of original construction.

By Risk Management, Kenny refers to the current philosophy of the board of directors toward the continued growth of the area. Having recognized, however reluctantly, that growth has become a way of life in the foothills, and that orderly development cannot take place economically when uncertainty regarding future services discourages investment, the board of directors has courageously committed itself to provide future services with facilities that have not yet been built. To provide future facilities as needed, the board

Reprinted, with permission, from the July 1985, Public Works.

has adopted capital connection fees that, collected as growth occurs, are intended to provide the capital for future system expansion.

To fund advance development of new capacity, EID uses Assessment Districts to provide capital. Although the intent is that user fees will pay for the facilities required to provide service, the Assessment District uses the value of the underlying property to provide the security to guarantee loan repayment.

Generally, participation in Assessment Districts for new service is voluntary. However, participation guarantees that a certain number of equivalent dwelling units may be served. Property owners who choose not to participate will be granted service later only upon payment of premium rates and connection fees.

Different Approaches

Two different approaches to repayment have been used. One approach is for new connection fees, collected as properties actually connect to the new facilities, to be used to service and retire debt as it becomes due. Property assessments would occur only if the rate of development was too slow to provide adequate debt service.

In the second approach, debt service is incorporated in monthly billings for service, and new connection fees are being set aside to fund future system expansions or replacement.

The evolution of this new philosophy has been neither quick nor easy and is a major departure from the past. Historically, El Dorado County dated back to gold rush days, and many of the existing irrigation ditch systems, which include over 100 miles of ditches, had their beginnings to serve the placer mines of that bygone era. More recently, in the 1950's, three major pipeline systems and the 35,000 acre-foot Sly Park Reservoir were built, with Bureau of Reclamation assistance, primarily to serve the local fruit growers and other light agricultural needs of the area.

If the history of the west is the history of its water, El Dorado County is no exception, despite the abundant runoff from the West Slope of the Sierra Nevada range, which provides its watershed. Housing, principally on one- to five-acre tracts, has sprung up wherever the pressure mains serve or extensions can be provided economically. Line extension requests have recently been received at a rate of 70 per month. As a result, the comparatively low cost capacity of the Bureau of Reclamation mains has been fully committed, or even over committed, leading to water shortages and pressure problems during the peak summer season. Correcting these deficiencies and effectively anticipating and providing for future capacity in a manner that will allow the district to meet its obligations is a major challenge to the district and its engineering department.

Not only must the district correctly forecast the type and location of future growth, but it must also correctly project the costs of providing the needed facilities to ensure that funds collected will be sufficient to provide the new systems to match demands for service.

New Tools, New Philosophy

To meet this challenge, the district's engineering department, headed by Engineering Director Ed Voelker, has had to revise its philosophy of operations and develop new tools to enable it to project future needs and problems with greater precision.

Among the tools recently acquired is an IBM PC and the software to perform water system hydraulic analysis in-house. Formerly, these activities had been performed by consultants for specific areas of the district. However, the recent rate of change and the multitude of systems needing analysis have made it essential both economically and for adequate responsiveness that this capability be available in-house.

Similarly, the district can no longer afford to update its master plan on a five-year cycle. Annual updates, done in-house, have proved necessary to keep pace with rapidly evolving systems and long lead times.

Faced with identifying the right projects to include in a multi-million dollar annual expansion and system reinforcement program, the district's engineering department must continue to develop its own skills and tools to cope with a growing demand for accurate prediction and effective management.

However, the commitment to the philosophy that "there will continue to be growth, and we must find the means to accommodate it," at the board level, is the crucial ingredient without which both the staff and the community as a whole would be unable to move forward with confidence.

It is not just the communities in the foothills that benefit from the progressive management now being applied to the task of providing important services. California's major population centers can grow only at great cost, and conversion of prime agricultural land to urban or suburban use is recognized as contrary to the public interest.

The foothills are an uncrowded area offering a variety of amenities in areas not well suited to agriculture on a large scale and are able to provide homes for significant population increases once basic services are provided. Leadership willing and able to accept responsibility for providing these services is the vital ingredient that EID is committed to supplying.

* * * * *

WHY YOU SHOULD "MAKE IT CLICK"

HERE ARE ANSWERS TO YOUR QUESTIONS ABOUT SAFETY BELTS

If you're like most people, you probably think of driving as a modern convenience. You just get in your car and drive—to work, to the store, to run errands, to visit friends. You don't think of driving as risky.

But statistics tell a different story. Car accidents are the fourth leading cause of death today.

National Highway Traffic Safety Administration (NHTSA) figures go even further. NHTSA estimates that each of us can expect to be in a car crash once every 10 years. For one out of 10 of us, it will be a serious accident. For one out of 60, it will be fatal.

Is the answer to this problem to give up driving? For many of us that would be almost impossible.

The solution is to protect ourselves from death and injury. The way to do it is cheap, widely available, and easily used.

The solution is buckling up.

When you get in your car, do you fasten your safety belt?

If you don't, you have plenty of company. More than four out of five drivers fail to buckle up.

In this case being in the majority may not be so smart.

Studies have shown that safety belts are almost 50 percent effective in saving lives when they're properly worn. This means that 50 percent fewer belt-users are killed in crashes than non-belt-users. In spite of this, only 13.8 percent of drivers wear their belts.

Why do so many of us take this chance? Maybe because we simply don't know how effective safety belts are.

Here are answers to some common questions about safety belts. See if they won't change your mind about taking unnecessary risks every time you get in your car.

Question: How do safety belts work?

Answer: A fastened safety belt distributes the force of a collision over your hips and shoulders—the part of the body that can best withstand the force. Your belt will also stretch a bit to absorb some of the impact of the force and, most important, stop your body from striking the hard interior surface of the car.

Reprinted from National Safety Council's "Family Safety," Spring 1984.

Q: Are safety belts effective?

A: Approximately 14,000 to 18,000 lives could be saved annually if all passenger-vehicle occupants used safety belts at all times. The National Highway Traffic Safety Administration estimates that safety belts reduce the chances of serious or fatal injury by 50 to 65 percent. Society could save millions of dollars. The National Safety Council estimates that motor vehicle deaths cost society \$41.6 billion—including the cost of insurance administration, medical expenses and lost wages—in 1982.

Q: Who should wear a safety belt?

A: Everyone. Children under 4 years old and weighing less than 40 pounds should ride in a child safety seat that meets or exceeds federal standards. Passengers should never hold an infant or child in their arms. An unrestrained infant will be thrown out of an adult's arms in a crash. And the adult, if not wearing a safety belt, will be forced forward and crush the infant. For additional protection, small children in child safety seats and older children who can use standard safety belts should ride in the back seat of the car.

Q: Should pregnant women wear safety belts?

A: An unborn child is protected by the natural defenses of the mother's body. But only safety belts can protect a pregnant mother in a vehicle. The survival of the mother is the most important factor in the survival of the baby. The American Medical Association states that despite the possibility of a belt-caused injury, pregnant women are much safer using a safety belt in the event of a sudden collision. Remember to set the belt low to pull in a downward direction on your pelvic bones; the belt should not pull back against the abdominal bulge. The lap belt should be worn snug, but not tight. Be sure to sit up straight—slouching can cause the belt to ride up on the abdomen. Also, be sure to consult a doctor after even a minor accident.

Q: But isn't it enough to have the driver buckled up?

A: No. If a crash occurs, a passenger can be thrown against the driver, injuring him or knocking him unconscious. Also, other passengers can be injured when the occupants are thrown against each other by the collision forces. For everyone in the car to be safe, everyone must be buckled up.

Q: I don't wear my safety belt all the time, just on long trips and on expressways. Isn't that enough?

A: Consider that 70 percent of crashes occur within 25 miles of home, and that most occur at speeds under 40 mph. Fatalities involving non-belted occupants have been recorded at speeds as low as 12 mph—about the speed you would be driving in a parking lot. So buckle up before driving to your shopping center, just as you would for a long trip.

Q: But at low speeds, can't I just brace myself against the dashboard or the steering wheel?

A: At the moderate speed of 30 mph, an auto collision would throw you forward with a force equal to 30 times your body weight. If, for example, you weigh 150 pounds, you would be thrown forward with

a force of 4,500 pounds. This is roughly equivalent to falling out of a third-floor window. Imagine bracing yourself against such an impact.

Q: Do I need both a lap and a shoulder belt?

A: A lap belt will protect you from serious injury. But a shoulder belt provides important additional protection. During a crash, a shoulder belt keeps your head and chest from striking the steering wheel, dashboard, and windshield. Using a lap and shoulder belt offers you the best possible protection in the event of a collision. You should never wear a shoulder belt without a lap belt. Without the lap belt, you can be thrown forward and under the shoulder belt. At best, this might cause a broken collarbone or leg. At worst, it could strangle you.

Q: Isn't it safer to be thrown clear in an accident?

A: The phrase "thrown clear" sounds safe enough until one visualizes just what it means. To be "thrown clear," an occupant would exit through the windshield. The force of the collision can throw you as much as 150 feet (15 car lengths). Once airborne, you would risk landing on a roadside object (such as a fence, a pole, a road sign, or a rock), and being run over by a vehicle. The safest place to be in a crash is inside the vehicle, protected by a fastened safety belt.

Q: But don't safety belts cause injuries?

A: Belted occupants in collisions have been known to suffer bruises along the lines where the safety belts cross over their body. Yet such injuries seem minor, and indeed preferable, when you compare them to the major injuries you could suffer from colliding with the dashboard, windshield, steering wheel, or another passenger.

Q: But do I really need safety belts? I'm a good driver and I've never had a serious accident.

A: Even if you are a good driver, the chances are that you will be involved in at least a minor accident at some time. Mechanical failure or unforeseen road conditions can suddenly present you with a situation that is beyond your control. Also, considering that 50 percent of all fatal car accidents involve a drinking driver, you cannot depend only on your own safe driving. Besides, buckling up is part of being a good driver.

* * * * *

WINTER DRIVING

When winter comes, driving becomes more of a challenge. It's harder to see because darkness comes earlier, and the roads become slippery in many parts of the country, leaving less room for drivers' mistakes to be corrected.

So, to make winter driving safer, you must slow down, make sure you can see others (and they can see you), and learn to brake correctly on slippery roads.

Follow these tips to see and be seen in snow, fog, and rain:

Make sure mirrors and windshields are clean. Dirty, scratched mirrors and windshields increase glare. Clean them with a soft, damp cloth.

Turn headlights on at dusk so others can see you. If you are wondering if it's dark enough to use headlights, it is. Better to have them on too early than too late.

Make sure your headlights are properly aimed, for your benefit and for other drivers. You can adjust them yourself if you have 35 to 40 feet of flat driveway (or one that is consistently sloped) by following these steps.

- Shine your low beams on the garage door from two or three feet away.

- Outline the bright spots on the door with a soft pencil or tape.

- Back the car up to about 25 feet from the door. The top of the low beams should shine no higher than the top of the marks on the door or lower than the center of the marked circle.

- Make the necessary adjustments. On most cars, each headlight has two phillips screws that adjust the beam up or down and left or right. These are visible without moving any hardware. If your car has only two headlights, the high beams are automatically aimed correctly when you aim the low headlights. If your car has four headlights, aim the low beams first. They are the outer or upper two lights. Then adjust the high beams until the center of the high is at the top of the low beam.

When you stop for gas, wipe off your headlights and taillights with a clean cloth. Clean lenses can increase headlight output by as much as 100 percent.

Keep your eyes moving to get a good picture of the entire scene around you. This will also relax eye muscles, which will tire quickly if the eyes are fixed on one spot on the road.

If you spend a day outdoors in bright sunshine, wear sunglasses. They help to preserve the eyes' supply of visual purple, a chemical that helps eyes adapt to the dark. A day of exposure to sun and glare without sunglasses can drastically reduce ability to see at night. But don't wear tinted glasses at night.

Reprinted from National Safety News, December 1984.

If you come out of a brightly lighted building into the dark, give your eyes a few minutes to adjust before you drive. And if you stop at night, you may want to wear sunglasses in brightly lighted rest areas to save your eyes from having to adjust all over again.

Don't smoke in your car. Smoking is a distraction that can prevent you from noticing what's going on ahead. Smoke also leaves a film on the windshield that decreases visibility.

Don't drink and drive. Aside from all the other reasons not to drive while intoxicated, alcohol drastically slows your eyes' recovery time from glare. Alcohol causes your eyes to take an extra second to hunt around for what they were seeing, and in that time, an accident can occur.

At night, especially in rural areas, oncoming vehicles can be detected quicker if you watch for their headlight reflection on electric or telephone lines alongside the road.

When you're following another vehicle at night, keep your headlights on low beam so you won't blind the other driver. Switch your lights from high to low beam when an oncoming vehicle is about 500 feet away. Use the low beam when you get within 300 feet of the driver you're following, and if an oncoming vehicle doesn't lower its high beams, don't try to give the driver a dose of his own medicine. Switch your own lights from high to low, then avoid the approaching glare by watching the right edge of the road and using it as a steering guide.

In snow or fog, switch to low beams; high beams reflect more off the fog or snow and increase glare.

Turn on your windshield wipers to clean moisture off the windshield, and use the defroster to cut condensation on the inside. In light rain, squirt washer fluid on the windshield before turning on the wipers; there may not be enough rainwater on the glass to wash road film off the windshield, resulting in streaking when you turn on the wipers.

When you can't see well, don't hunch forward—you will tend to focus at the end of the car's hood. You will see more, both ahead and to the side, if you sit in a normal position. You should roll down the side window partway so you can hear road noises better; they may compensate for your reduced seeing ability.

You should always slow down and leave more following room in bad weather. If you have to brake, don't slam your foot on the pedal—this will lock up your brakes, and your tires will slide instead of roll. Once this happens, you will lose your ability to steer.

At one time, driving experts suggested pumping the brakes to maintain control. But disc brakes can lock up when pumped, so now the recommended technique is "squeezing." This means you squeeze the pedal until you sense the brakes are ready to lock up (you should test your car's ability in a parking lot to get used to the touch on the brakes), then let off, squeeze again, and repeat until the car has stopped or slowed down as necessary. If you do hit the brakes too hard and lock up your wheels, you can still come out of it by letting off the pedal and trying to steer out of trouble.

If you're on snow or ice, don't make sudden steering movements. Remember, in bad weather, the key words while driving are slowly and gradually.

* * * * *



The purpose of this Bulletin is to serve as a medium of exchanging operation and maintenance information. Its success depends upon your help in obtaining and submitting new and useful O&M ideas.

Advertise your district's or project's resourcefulness by having an article published in the Bulletin! So let us hear from you soon.

Prospective material should be submitted through your Bureau of Reclamation Regional Office.

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interests of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. Administration.

A free pamphlet is available from the Bureau entitled "Publications for Sale." It describes some of the technical publications currently available, their cost, and how to order them. The pamphlet can be obtained upon request from the Bureau of Reclamation, Attn D-822A, P O Box 25007, Denver Federal Center, Denver CO 80225-0007.