

Section V: Innovations

Changes in Gravel Maintenance

Many people feel that gravel maintenance really hasn't changed much since the grader and drag were invented. This is not true. The use of our gravel roads has changed dramatically in many ways. In much of the Great Plains region of the country, the amount of traffic has actually declined as farms and ranches get larger. Even though the volume of traffic is less, the vehicles and equipment are much larger. Larger trucks use gravel roads everywhere in the country. This has forced a change in the way roads are maintained and some of the processes used.

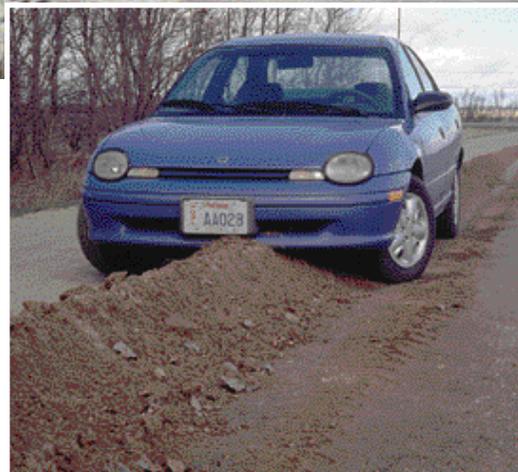
Changing Conditions — Equipment, Trucks, Cars

While trucks and equipment on gravel roads are larger, cars have become smaller. It is important to be aware of this in maintenance operations. For example, when harvest begins, maintenance crews will often have to maintain gravel roads more frequently because of increased rutting and distress from



Example of very large trucks used today. These can often be found on gravel roads. Today's gravel roads are exposed to these heavy loads and therefore a more intensive maintenance program is required.

Another change to consider. Smaller vehicles cannot cross large windrows of material on the roadway. A greater effort has to be made to warn as well as to control traffic on these gravel roads while doing maintenance.



heavy loads. In contrast to this are the smaller-sized vehicles such as mini-vans that use gravel roads. It is critical to consider this when pulling large windrows of material out into the roadway during major reshaping. Larger cars of 25 years ago and more could pull through these windrows as long as they reduced their speed and drove prudently. The same condition could send a smaller car out of control.

Innovations

An ancient writer said, "There's nothing new under the sun." That's true in a sense. But one needs to look at different ways of doing work, of making one piece of equipment do more things, of trying different means of strengthening weak road base, etc. This section will show and discuss a few things, but always be alert for things that can make the maintenance better and/or more efficient. Maintenance operators

are sometimes remarkably innovative with simple ways to change a machine or a process. Evaluate what you see. It may work for you, or perhaps you can adapt it further. For example, new products are becoming available that actually change the properties of soils. Evaluate these products as they become available in your region. It may be worth trying on a short section of road and then evaluating it for a period of time.

Innovative Equipment and Methods



A machine made in Canada pulverizes gravel windrows into usable material on the roadway.



A machine fabricated specially by Hyde County in South Dakota to pulverize heavy windrows of recovered gravel and grass from the shoulder. It quickly breaks down windrows for reuse on the road.

Windrow Pulverizers

The need to reshape a gravel road periodically to restore overall shape and drainage has been stressed. The need becomes even more urgent under heavy traffic when the road begins to rut and fail. But this often means pulling vegetation onto the road. This could come from cleaning a ditch or simply eliminating a high shoulder. Sometimes the material has to be removed and loaders and excavators may be needed. But sometimes the material is primarily recovered gravel that can be used on the road. How do you deal with the chunks of sod that come with it? At least one machine is on the market which is designed to quickly pulverize this material.

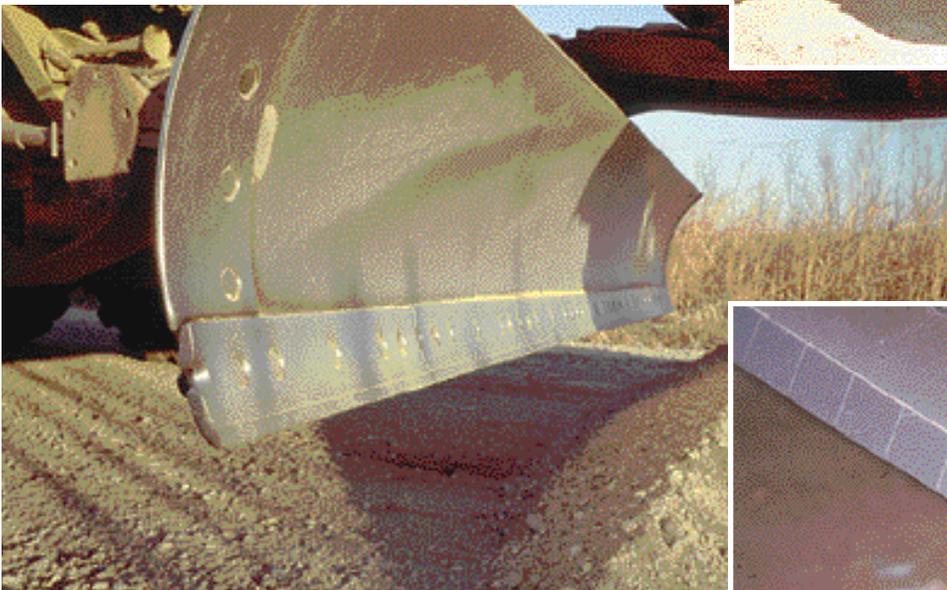
New Cutting Edges

There have been several types of carbide-tipped bits adapted for use on the cutting edges of graders. For example, these will help an operator cut out a washboard area with less time and effort than a conventional cutting edge. They also do a better job of mixing material as it is cut from the road. They do not work for every situation in maintenance but do some special jobs very well.

Carbide-faced cutting edges are also available. Although expensive, they are extremely resistant to abrasive wear and are a great help in reducing center wear on the cutting edge.



Examples of different types of replaceable bits for cutting edges.



An example of a carbide-faced blade after 650 hours of use. The center sections had been exchanged with the outer sections once during this time.



Shouldering Disks

Eliminating high shoulders that develop along the edge of gravel roads is always important. Special shouldering disks have been developed for use on motorgraders or tractors to make this job easier.



Same machine mounted on a farm tractor to help break up material on shoulder.

The use of a shouldering disk helps mulch up the sod and vegetation before it is pulled onto the roadway either to be removed or recycled on the road as reusable gravel.

Grader-mounted Dozer Blade

Modern motorgraders are often equipped with parallel lifts for front attachments. This is particularly common in northern regions for carrying snowplows. A grader becomes even more versatile if a dozer blade is attached for summer use. A bonus is the small amount of added weight that helps stabilize the machine for routine blading.



This dozer blade is also equipped with carbide bits which allows the operator to use it for particularly hard cutting such as taking out washboard areas on the road. The operator then uses the grader's moldboard with a conventional cutting edge to shape the area.



The dozer attachment allows this operator to push a load of rocks into a frost boil with the grader. Without this option, a loader would likely have to be brought to the job.

Grader-mounted Roller

In some rural regions of the country where more space is available for turning and maneuvering, a grader-mounted roller may be feasible. It is an efficient way to combine blading and compaction operations when budgets are tight and extra personnel are not available. When adequate moisture is present, the use of such a machine will definitely produce a tighter and smoother surface. These can be used in routine maintenance operations as well as in placing fresh gravel.



A grader-mounted roller being used on a rural gravel road. This department owns three of these units.

Rakes

The rake attachment is not new, but some methods of using it certainly are. Rakes are now available for pickup trucks and skid steer loaders. They work well for light maintenance — particularly in quarry-type gravels. They also work very well for lightly opening the surface to help dry out roads during the spring thaw when conventional equipment such as the grader are too heavy for the weak roads.



Other Tractor-mounted Blading Devices

Simple blades attached to tractors have been used for a long time. But recent changes improve the concept. The device illustrated below prevents the material from spilling from the sides of the blade and allows the operator to carry enough gravel along the way to fill small pot-holes and depressions. Skillful use of these will allow the performance of many types of light maintenance, especially in tight quarters.



A simple front-mounted rake attachment for a pickup truck. The vehicle can be used daily for other work such as sign maintenance, either while using the rake or after the rake has been removed.

A rear-mounted blading device on a farm tractor. The attachment can quickly be removed and the tractor can be used for other purposes such as mowing. These work well for tight quarters such as alley maintenance in towns.

