

APPENDIX II

WARTIME ROADSIDE MAINTENANCE

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INTRODUCTION

This compilation has been made from an informal interchange of information on roadside maintenance among men in charge of roadside development work in a number of the States. It is not intended as a complete treatise on roadside maintenance or a statement of hard and fast recommendations. It is hoped, however, that this summary of practices found to be workable in a number of States in 1942 and 1943 will be helpful to all in carrying on in 1944 with whatever equipment, labor and materials are available for roadside Administration.

In addition to information supplied by landscape engineers and roadside development engineers of a number of States, additional information on wartime roadside maintenance practices of States not otherwise covered was furnished by Mr. George E. Gordon, Public Roads Administration.

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As the first sudden wave of wartime economy in the maintenance of roadsides subsided, and there was the opportunity for careful consideration of the effects of the economy practices, it was generally found that the elimination of some items of roadside maintenance resulted in increased cost of other general highway maintenance operations; some tended toward decreasing the safety of highway travel; some endangered crop production; and some reacted against the recreational needs of a public that is under the rush and strain of wartime work.

Although fully realizing the need for economy, and for conservation of labor, equipment, and materials under present wartime conditions, it is thought that the curtailment of most, or perhaps all items of roadside maintenance is to be preferred rather than the complete elimination of some of the maintenance operations. The current problem is not one of maintaining the best roadside appearance; rather it is one of helping to keep highways safe and efficient, and to keep under control any effects that would cause a permanent loss of the investments made in past years in the nation's roadsides.

Erosion Control. Roadside erosion has an effect on all other highway maintenance. Soil eroded from slopes into roadside gutters must be removed or endanger the surfacing of the highway, particularly if it is a flexible type. Ruts or small washes in shoulders present a hazard to traffic and must not be neglected any more than the pouring of pavement cracks.

In many States in the past, regular maintenance operations included a considerable amount of flattening and rounding of slopes, reconstruction and improvement of drainage structures, seeding and sodding on old highways that had been constructed with narrow cross-sections and steep slopes. Most of this extra betterment work has rightfully been discontinued as an economy and conservation measure, except for places where erosion or lack of drainage threaten to cause extreme damage to the highway. In such cases when repairs are necessary, it is more economical to do a complete job of erosion control, if at all possible, to prevent recurrence of the same trouble, which is likely if only makeshift repairs are made.

The above applies to extreme conditions; but for the ordinary run of roadside erosion, the extensive programs of seeding or sodding must be curtailed, and as a substitute the practice of mulching can be stressed. Mulching alone, without any topsoiling, fertilizing, or seeding, is of great value in checking erosion on slopes. Seeding can be done at some later date through the mulch.

Roadside cuttings---wild grasses, non-noxious weeds, and even briars and first year growth of woody plants---can be used very successfully as mulch in place of the straw and hay which has become so costly and scarce. There seems to be no logical agricultural objection to the use of roadside cuttings as mulch in extensive wooded areas, and even where the highway runs through cropland, little serious opposition has been advanced in many States provided cuttings containing noxious weeds are not used.

If cutting is done after roadside grasses and weeds have matured, the seed contained in the mulch will provide a seeding without cost, to supplement the value of the mulch itself. Soft green early season cuttings are not as good as mature growth, but it must be remembered that any mulch is much better than no mulch at all.

Even though labor and equipment are not available for extensive topsoiling, the use of a very thin "sprinkling" of good topsoil in connection with mulching will be very beneficial. Topsoil that is to be used in this way should have a large amount of humus, grass roots, and seeds since it is these things rather than the depth of topsoil that is of value in getting vegetation started. As one field superintendent described it, it is merely a "coloring" of the slope with a small amount of soil obtained from the top of slopes.

Under present conditions, a labor shortage may prevent the extensive collection and use of roadside cuttings as mulch, and in most instances equipment is not available for hauling mulch, but use of cuttings on slopes immediately adjacent to where they were cut will be a big help in controlling erosion even if it is not the ideal condition.

Reseeding of small areas of failures in vegetative cover has been curtailed greatly, but here again the use of mulch immediately on bare or weak spots will save more serious failures later.

Fertilizing of existing vegetative cover has generally been curtailed, but wherever possible the turf on shoulders and in roadside gutters should be fertilized to maintain thick vigorous cover. Although some grades of mixed fertilizers have been discontinued and there is a scarcity of some fertilizer materials, the restric-

tions on nitrogen have been relaxed. With nitrogen available again, and with a little extra effort in determining the best possible fertilizing program according to the needs of the soil and type of turf and the fertilizer materials that are available, a necessary minimum of fertilizing of at least shoulder and gutter turf may be possible under a reduced budget.

Old established turf shoulders that have "built-up" enough to prevent proper drainage present a maintenance problem when equipment and labor are not available for proper reworking without destroying the turf. As a temporary correction measure, relatively wide outlets can be cut through the shoulder turf at low points in the grade. These outlets can be protected with sod salvaged from the shoulder or by an inexpensive bituminous protection. Admittedly a makeshift operation, it is decidedly better in most locations than machine blading of the shoulder and leaving it bare and subject to serious erosion because of inability to save topsoil and turf or re-establish turf cover by reseeding.

Mowing. Mowing is an item of roadside maintenance which can be reduced considerably both in width and frequency.

It is essential, however, to mow turf shoulders and roadside gutters frequently enough to: (1) prevent deterioration of the turf and subsequent recurrence of erosion; (2) prevent traffic hazards due to high grass and weeds; (3) prevent interference with drainage; and (4) reduce the risk of roadside fires, particularly in wooded areas.

If mowing is not done frequently enough on these areas, the turf plants will become spindly and weak, and weeds will take hold and crowd out the turf plants. This is particularly true in southern States where Bermuda grass, which will not stand overshadowing by taller grasses and weeds, is a principal safeguard against erosion.

Tall grass and weeds on shoulders cause pedestrians to walk on the pavement edge, and also cause an unconscious tendency on the part of the motor vehicle operator to shy away from the shoulder and travel too close to the center of the pavement.

Tall grass and weeds in roadside gutters interfere with the free movement of water in these channels, and cause deposition of silt that would not occur if a low, close turf is maintained.

The risk of fires, particularly forest fires, starting from matches, cigarettes, etc., thrown onto the roadside is probably over-emphasized, but if roadside areas between gutter lines are kept mowed and thus kept free from tall dry grass, the fire hazard is reduced to a negligible amount.

On narrow roadway cross-sections the shoulder and gutter areas should be mowed regularly, or at least to the flow line of the gutter if it is not possible to mow the entire gutter section. On fills, one swath outside of the edge of shoulder is advisable.

On wide cross-sections, mowing should be done regularly for a width of one swath outside of the shoulder edge in both cuts and fills.

The number of mowings per season depends upon the length of growing season and type of turf. For economy reasons a maximum of four (4) mowings is suggested, and an absolute minimum under any conditions would be twice during the season. One mowing of shoulders in late fall after the end of the growing season will be helpful in the removal of snow from pavement and shoulders.

Other than the shoulder and gutter areas just discussed, the mowing of the remainder of rights of way through cultivated land or other open country can be reduced to one mowing per year for the purpose of preventing spread of weeds, particularly noxious weeds, to cropland; and in the snow belt to prevent drifting of snow that will be caused by tall grass and weeds.

All mowing outside of shoulder and gutter areas can be eliminated in wooded areas, and even in cultivated areas the once-a-year mowing suggested above need not be done if there is not a weed or snow problem. Although not an ideal situation, the deterioration of turf due to lack of mowing is somewhat offset by the matting down of tall growth to form a protecting mulch, and by natural reseeding from the mature grass growth.

Mention should be made here of the fallacy of extremely close mowing of shoulders, median strips and intersections. This "shaving" of the turf is detrimental either in peace or war, but in addition, close mowing causes far more wear and tear on equipment due to hitting small sticks, stones, or other debris that a mower cutting approximately three inches high would miss. Similarly the mowing of shoulders and median strips by the calendar every two weeks or every three weeks, for example, instead of mowing according to weather conditions, and the condition of the turf might also have serious effects on the life and vigor of the turf. It could happen that the reduced mowing of wartime would be a boon to the turf on some highway shoulders. (In general, keep cutter bars up to a 3-inch cutting height.)

Right-of-Way Clean-up. The term "right-of-way clean-up" as used here refers to the cutting by hand of heavy weeds, briars, and young tree growth on the outer portion of the right-of-way, and also to the cutting of lighter grass and weeds in areas inaccessible to mowing machinery. This work is variously known as right-of-way cutting, shrubbing, bushing, brushing, or brambling.

In open and cultivated areas, a right-of-way clean-up once a year is usually necessary for the same reasons as previously mentioned for mowing--control of noxious weeds or snowdrift prevention.

In wooded areas, however, this right-of-way clean-up can be dispensed with, (or at least done only once every two years instead of every year) except perhaps in some very high fire-risk areas, or in some swampy areas where growth is so dense and rapid that it would be more costly to cut after two or more years than it would be to cut each year while growth is young and small.

It is in wooded areas where elimination of clean-up can save much labor, at least sacrifice to appearance. The wooded land adjacent to the right-of-way is rough in appearance so a rough looking right-of-way, back of the gutter lines, is not out of place. In fact it blends well with the surrounding woodland.

There is one other distinct advantage to elimination of right-of-way cutting particularly on high steep slopes. To cut these steep slopes, laborers must walk around over them and every scuffing footprint is a potential source of new erosion—the very thing that vegetation on the slope is intended to prevent. What many steep slopes on which some light vegetative cover has been established need most is a whole lot of "letting alone" so that volunteer native grass and vines and woody tree and shrub growth can become established and with deeper roots hold the soil more firmly.

Of course in all curtailment or elimination of mowing and right-of-way clearing up, it must always be remembered that sufficient labor, equipment and funds must be reserved first of all to (1) keep sight distance open on inside of curves and at intersections; (2) keep directional and warning signs clearly visible at all times; (3) keep all guard rails and guard posts exposed; and (4) keep pipe lines, culverts, and bridges free from any growth which might obstruct drainage or cause collection of debris that would obstruct drainage.

Weed Control. In some States the highway organizations are required by law to eradicate noxious weeds within highway rights-of-way and even where there is not a legal requirement it is in the public interest to keep noxious weeds from spreading to farms, particularly in this wartime period of farm labor shortage and need for increased crop production.

Therefore, this phase of roadside maintenance must be continued without curtailment, but some States have been successfully making a substitution of materials. California has found borax successful for the control of Klamath weed, and Missouri is using an "agricultural mesh" borax instead of sodium chlorate for eradication of bindweed.

Missouri finds this borax cheaper than sodium chlorate, safe to handle, and non-poisonous to animals. It can be stored indefinitely, needs no special equipment or operators to apply, and grass will come back after one year's time. It is applied by hand or lime spreader at the rate of 15 pounds per square rod in early spring or late fall.

One of the first roadside maintenance economy moves contemplated in many States was the closing of roadside park areas and smaller picnic table sites. The closing was generally postponed for a period of observation and it was soon found that the amount of use of these areas remained practically the same as in pre-war years. The type of users changed considerably, switching principally from tourist traffic to use by interstate truckers as rest stops and to use by residents of nearby crowded war production centers as recreational areas, since they can be reached without driving great distances.

The maintenance of roadside park areas is one case where there is little chance for a middle ground between elimination and full maintenance. If use warrants the continuation of the area, it should continue to receive a high standard of maintenance. If, on the other hand, an area is to be closed, any movable equipment should be removed and stored, directional signs removed, and entrance roads closed if possible so that any use of the area will be discouraged.

Tree and Shrub Care. The general attitude toward the care of trees and shrubs that have been preserved or planted for landscape effect seems to be one of doing only enough maintenance to protect the plant investment rather than to keep them up to the optimum appearance.

Pruning, sufficient clean-up to eliminate the fire hazard, and a minimum of cultivation will be needed to prevent weakening of the plantings, but fertilizing, extensive cultivation, and minor practices such as careful outlining of plant beds can be generally curtailed.

The pruning and spraying of large shade trees can generally be reduced except in areas of serious disease or insect infestation, or where trimming is essential for the safety of traffic. Some States have reduced trimming to a very minimum but continue a full program of spraying in order to assure keeping the trees healthy and avoid a still greater amount of trimming a year or two later.

Since trimming, other than for safety, is an operation that can be carried on in a slack winter season with either small or large crews, it is one phase of roadside maintenance that can be easily and rapidly adjusted to sudden changes in conditions.

An interesting point brought out in connection with roadside plant maintenance is that where native species of plants were selected and planted with thought being given to plant ecology, such plantings are requiring little or no attention and therefore will not be affected by wartime reduction in maintenance.