Highway Maintenance

Editor's Note: Recognizing that highway maintenance problems are complex and varied in the industry WTT will from time to time carry experiences of how states in various parts of the nation are approaching the tasks of economically and efficiently keeping their highways safe and beautiful. Reports in this issue are made with the help of the Kentucky Division of Roadside Development and the Massachusetts Department of Public Works.

Phase I. Task-Force Initiate

A midwestern state reports on organizing and planning for chemical weed control on a statewide basis.

KENTUCKY has turned to chemical spraying for highway weed control. The Department of Highways through its Division of Roadside Development has initiated a carefully planned operation for the entire state. Results after the first year spell success.

In a special report to WTT, J. M. Phillips, director of Public Affairs for Kentucky's highway department, credits widespread support for initial progress.

Kentucky's highway department expected some questions regarding an all-out spray program. But recognizing that it had a job to do, the decision to spray was made and a careful step-by-step approach adopted. Management and details of initiating the program were turned over to the Division of Roadside Development.

Spray rig safety devices are important in Kentucky's highway equipment. Note mask over face to protect against drifting materials, communication system which keeps operator in touch with driver, and mandatory seat belt. Operator is Wilber Sheriff of state's special spray crew.

Special crew training for Kentucky involved bringing key men from 12 state districts to central office during the season as need indicated. Division of Roadside Development found central training sessions provided opportunity for foremen and others to trade experiences gained as program progressed.

A firm policy for program control was established. Simply stated, it was that any management of roadside vegetation should be done by using the safest, most effective, and economical method. Where chemical weed and brush control met requirements, these would be used. Indiscriminate spraying would not be tolerated.

To insure that this policy would be carried out, Chief Agronomist Jim Griffin, under the direction of K. C. Arnold, head of the Division, was named to guide the chemical phase of

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Multiphased Management Task Faced By Our 50 States

Phase II, Project Utility

An eastern state reports on highway maintenance aimed at both safety and beauty.

MASSACHUSETTS ties safety and beauty together in a practical approach to highway roadside development.

In reporting on the Bay State program, Joseph L. Beasley, highway landscape supervisor for the Department of Public Works, states that new visionary thinking and new approaches in roadside development can enable the industry to conceive and prepare roadsides for future generations.

Highways, Beasley says, are wide corridors passing through our countryside. After many years of practical experience in the field and dozens of completed projects, he feels that prior to, and after highway development, there is a need for adequate land acquisition in order to fully protect this corridor. Proper development will then improve this corridor.

Beasley does not believe that trees can be planted just for the sake of planting trees. In Massachusetts, there is a reason and need for every tree, shrub or yard of mulch used. Though it may appear that larger than necessary quantities of planting materials are being used in the Bay State program, he points out that the amount is only 30% of the total needed to replace the areas stripped of plants and trees during construction of new highways.

One goal of the program, which is in line with President Lyndon Johnson's beautification program, is to salvage all remnants of land left after a highway has been constructed. Both those pieces of land in urban and rural areas are used as small parks or planted with trees or shrubs for posterity. Emphasis in urban areas is for more large-scale landscaping, including greater scope and use of larger plant material.

Roadsides on urban sections of the Interstate System are usually narrow. This limits possibilities in development. Careful study and use of specialized plant material is needed to develop them. Each stretch of highway and each interchange presents an individual problem. Many times plant-

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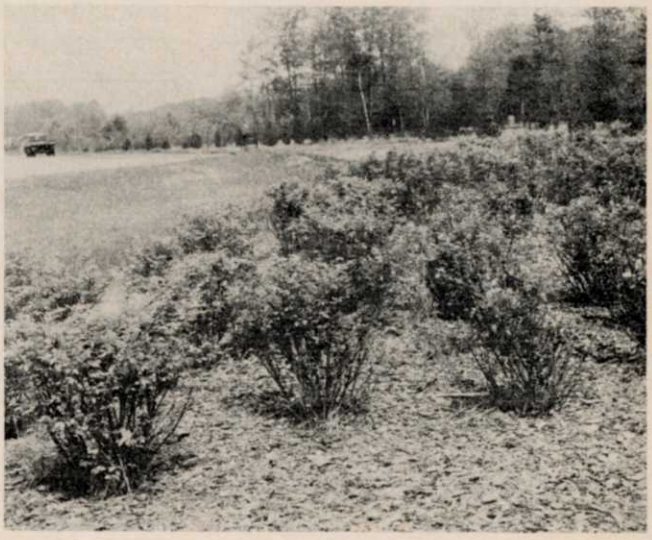
Example of formal planting in the Massachusetts program is this interchange located at intersection of Routes 128 and 37 near Braintree. Joseph L. Beasley, Department of Public Works, reports that bridge abutments, including bed plantings and individual trees are mulched with 3 inches of wood chips.



Roadside rest area near Swansea on Route 195 contains successful planting with wood chip mulch. Massachusetts plan calls for giving prime consideration to shade trees in such areas. Note evergreens and natural growth in background.

Kentucky Program
(from page 8)

turf management. Assisted by regional agronomists, he worked closely with spray crews.

Foremen and special crews were selected and trained via special field days. First choice for spray crew foremen, one for each of the 12 state highway districts, were foremen of existing special crews, since they knew local highways, residents and terrain. Where such men were not available, prospects were carefully screened. Foremen, in turn and with the help of agronomists, selected members of their crews.

Intensive Training At All Levels

Intensive training was given foremen in a 5-day program at the central office. Department agronomists with the help of technical consultants schooled leaders in every aspect of the new Kentucky program. Foremen were prepared to drill crews on procedures and in use of equipment on return to their districts. One phase of the policy was that no application of spray materials be made until crew members understood the necessary methods and procedure.

Foremen were further charged with the task of deciding what spraying needed to be done in their own districts. With their crews, and accompanied by an agronomist, they covered every mile of highway right-of-way in their districts. Purpose of this phase of the program was to spot the type weeds and brush, where located, and control for each. Logbooks were compiled as they proceeded. These logbooks then became a work plan, plus becoming the basis for a proposed budget to finance the coming year's work.

A by-product of this mile-by-mile inspection of the rights-of-way was job appreciation. Foremen and crews alike developed an awareness of the importance of the program and how it would contribute to the safety and beauty of Kentucky's highway system. This background and training proved to be vital in success of the program. Men who would do the work were made to realize that changing weather creates limitations on spraying, that seasonal effects and growth habits of plants must be understood. A work plan laid out a year in advance and based on familiarity with the areas to be treated aided foremen and crews in applying their new and first-hand knowledge.

For example, weed and brush control was to be handled in such a way that it would contribute to highway appearance, and certainly not detract. Indiscriminate spraying to kill tall brush would not meet this criteria. Thus a rule was developed that no plant more than 3 feet tall would be sprayed while in leaf. Procedure was to cut and then treat the stump. Tall brush could be sprayed while dormant, then removed the next season.

Suitable Equipment A Part of Plan

During the period when crews were being picked and trained, selection of suitable equipment demanded attention. Safety to operators and protection of desirable plants in areas to be sprayed were factors. Equipment was purchased which would deliver high volume at low pressure, to insure large droplets so nozzled as to provide careful control of spray pattern. The new equipment also included a seat mounted at the rear of the spray boom which would provide the operator with visual control of the spray. An intercom connection with the truck driver provided an extra margin of safety. Equipment was also selected for adequate capacity, simple design, and rugged construction. Safety belts for operators were musts. Spray trucks were lighted and marked for safety.

Climate and farm areas in Kentucky require chemical formulations of low volatility. To keep the program simple and manageable, materials which were useful for both foliage and dormant treatment were sought. Specifications along these lines were written and bids were asked from suppliers. Successful bidders were asked to maintain a close working relationship in areas where their products were being used.

As the program began to develop, foremen and agronomists were each asked to begin compiling a handbook. Into these handbooks went operational memoranda, informational materials from the industry, sprayer calibrations, legal guidance and records.

Major evaluation of the entire program was made at the end of the year. Each foreman was asked to evaluate his own work area and all foremen brought together to exchange ideas, information and experiences. Overall results are encouraging and Department thinking is to enlarge and improve the program, at the same time maintaining current policies and procedures. Public acceptance is indicated by the rarity of complaints during the past year.

A major aspect which will continue is allowing for the natural revegetation of native plants in areas where such is desirable and fitting. This type approach is not only saving maintenance dollars but is helping new highways to become more a part of the natural landscape.

Steps In the Kentucky Highway Maintenance Plan

1. Recognition and study of the problem.
2. Assignment of an agronomist to guide chemical use.
3. Careful selection of a crew foreman for each district.
4. Intensive training of foremen.
5. Handpicking and training of crews.
6. Equipment selection and procurement.
7. Determining specific problem areas by district and development of logbooks.
8. Setting up work schedules one year in advance.
9. Compiling of handbooks by foremen and agronomists during course of the year.
10. Evaluation meeting at end of year and policy determination by Department.

Massachusetts Program
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ings are advantageous. In other cases they are hazards creating blind, accident-prone areas.

The Massachusetts program also calls for making maximum use of local, natural growth in the area. Natural growth is not a cure-all, but does have a prominent place in roadside design along with turf and the more sophisticated plantings.

Turf Established
Minimum of 30 feet

Grass is planted for a distance of 30 feet on both sides of all roadways in the state. This produces the necessary sight distance for safety. It also prevents the roadway being shaded and helps in snow and ice control operations. Tree hazards close to road surfaces are also eliminated. Open turf areas on each side of the highway give the feeling of ample width so that motorists make full use of travel lanes. Beasley points out, however, that the 30-foot distance on each side of the roadbed is only a starting point. Fill slopes with guardrails are never planted to grass, but to some low-growing natural growth cover. Turf should never be seeded or laid on cut slopes beyond a point five feet from the toe of the slope, or at a distance greater than can be reached by the cutterbar of a tractor mower. Turf many times is used effectively at distances much greater than 30 feet, usually on fairly level areas. In short, the back line of the turf is not maintained as a straight line parallel with the road surface, but is varied from place to place.

Beyond this turf back line, to the outer limits disturbed by construction, first consideration is in replacing the type of natural growth removed. For example, if pine growth has been removed, the area is designed for use of woody mulch and pine seedlings, spaced about 5 feet on centers. If all survive, salvage thinning is done at a later date.

Plantings such as these increase in value and the roadsides improve in appearance each year. Turf areas are more apt to decline as the years pass.

Beasley's recommendations for planting based on the Massachusetts system call for mass planting of trees and shrubs. Various plantings are drifted into one another. Trees are planted in groves, groups, or clumps to present a natural appearance. Following are what he considers satisfactory locations for planting:

1. Plant as near as possible to location line.
2. On highways with wide layout groups of growing trees, plant halfway between shoulder and location line with taller growing shade trees and evergreens planted in back of or between these groups and the location line.
3. In bowl areas at interchanges, trees are not planted less than 35 feet from the ramp road and not less than 15 feet outside the toe of the slope, so that they will not interfere with sight distance or mowing.
4. Trees are planted and grouped in such a manner that they cause minimum interference with mowing equipment or other maintenance operations and overhead utility lines.
5. Evergreens are planted in checkerboard fashion on abutment slopes and on the fill slopes of interchanges.
6. Trees set out in groups consist of 3 to 5, 7, or 15 of the same species. At interchanges or wide layout areas, 15 or 20 in a group is common.
7. Willow trees are used only in moist locations and far enough back within the layout to allow for their size at full maturity.
8. Gravel pits, dumps, maintenance areas and other such views are screened with evergreens.
9. Unsightly areas which are difficult to mow and not practical to grade and seed are planted with groups of trees or evergreens.
10. Planting of trees at roadside rest areas for shading are given prime consideration.

Unsatisfactory locations of tree plantings are important, too, in design and planning. Unsatisfactory spots listed by Beasley are: Under utility wires unless the specie is low growing; in grassed areas between curbing and sidewalk; on the inside of curves where sight distance would be decreased appreciably; in areas close to street intersections at grade or at drives where sight distance would be decreased; less than 12 feet from edge of shoulder on narrow layout highways and less than 35 feet on wide layout or limited access highways; in straight rows or at set distances; in median strips less than 30 feet in width; in open areas within the layout where there is already a suitable background of trees and shrubbery; in dividing strips of ramps; in front of attractive bridge abutments; and where planting may screen vistas or picturesque scenery.

By way of summary, Beasley believes that better roadside turf management can help solve maintenance problems. Further, it is the responsibility of the industry, he feels, to leave a heritage of green and beautiful roadsides for future generations to enjoy.

Massachusetts Plan For Safety and Beauty

1. Recognize that highways are a corridor passing through our countryside—to be improved and protected—for safety and beauty, and for future generations.
2. Salvage construction remnants of land—for small parks or tree plantings.
3. Treat each stretch of highway and each interchange as an individual project.
4. Make maximum use of natural growth in area.
5. Grass first 30 feet alongside highway for safety (and vary the backline of grass).
6. Maintain an awareness that a beautiful highway is a safe highway.
7. Plan planting locations carefully.
8. Continue to develop the policy that careful management helps solve maintenance problems.