

GROUND-COVER PLANTS AND PLANTING

By Mark H. Astrup, Landscape Engineer
Oregon State Highway Department

At the closing business meeting of the Committee on Roadside Development, held December 16, 1949, in Washington, I accepted the responsibility of compiling a list of ground cover plants for highway planting. To obtain this information, an instruction sheet and report form was prepared and distributed to all states through the Divisional Coordinators to determine what ground-cover plants were being used or recommended for use. The report form requested information as to special uses, characteristics or requirements of the plants listed, the recommended spacing in planting, and the availability of such plants. The listings were requested in three classifications: low shrubs; vines; and herbaceous perennials, including ferns and wildflowers. Grasses were purposely omitted as they were considered a subject by themselves. To standardize reporting, an arbitrary definition of ground cover plants was given, namely; "Ground covers are deciduous or evergreen perennial plants whose height at maturity does not exceed, or can be held to, 2 feet and which are suitable for planting with or in lieu of grass on highway median islands and cut or fill slopes."

Although the response to date has not been complete, replies have been received from 26 states, 2 of which have abandoned use of ground-cover plants and 2 do not use them as they have no landscape organizations.^{1/}

The instructions also referred to Dr. Donald Wyman's book Shrubs and Vines for American Gardens, but erred in not specifically requesting that the lists be submitted in accordance with the map given therein, showing the hardiness zones of the United States and Canada. Consequently, the incomplete lists which have been compiled, and which are far too lengthy to repeat here, have been broken down by the Bureau of Public Road Districts as being the most practical for immediate use. A comprehensive breakdown by hardiness zones will be required before the lists have their optimum value for publication and reference. This requirement is easily understood when it is realized that several of the states have up to five hardiness zones within their boundaries.

The subject of "ground covers" seems to divide itself into two general classifications; those used primarily for slope erosion control and those used for planting on median strips and intersection islands. These two classifications are included in the report on "The Selection and Use of Ground Covers in Highway Areas," published ten years ago by a subcommittee on plant ecology under the chairmanship of George B. Gordon. I would like to review briefly this report which emphasized the following basic points:

^{1/} - The plant lists in this progress report (see Appendix) have been compiled from information furnished by the States, and are circulated for review and comment without any implied endorsement by the Committee.

1. "The establishment of native ground covers on cut and fill slopes and highway gutter areas is the most effective method of preventing soil erosion on highway lands.
2. "Successful control of erosion on highway areas by means of ground covers is largely dependent upon a properly rounded cross section which can most economically be provided as a part of the original construction contracts.
3. "Selection of the proper ground covers or combination of native or naturalized ground covers for a given highway area can be determined by technical landscape analysis of each seeding or planting site. Existing native growth is the most reliable indicator of the plant or plants to be selected.
4. "Planting operations to be successful must be performed by crews which include at least a cadre of experienced labor. Good technical direction and inspection plus skilled labor in planting operations must be supplemented by mulching where necessary and by proper maintenance after seeding or planting.
5. "If planted ground covers are properly mulched and pruned at the time of planting, watering and other maintenance should not be necessary after about the second growing season following planting.
6. "Intersection triangles and median strips in divided highways should be, as far as possible, merged by means of seeded or planted vegetation into the terrain which adjoins the highway. This objective implies the use of native or well naturalized plants and usually bars use of garden types of plant materials on open country roadsides.
7. "High-growing shrubs or evergreen trees are rarely suitable for intersection or median-strip planting. Ground covers or grasses which will not exceed a height at maturity of about 3 feet are indicated in the interest of traffic safety and economical maintenance.
8. "As a rule, the best ground cover for intersection triangles and median dividing lanes is a low-growing vine such as Hall's honeysuckle, periwinkle, or wichuriana rose. Such a ground cover once established requires little or no maintenance. Where grasses are used on intersection areas, a meadow type of sod rather than lawn sod should be established. Lawn mowing and maintenance is very costly.
9. "On slopes or intersection areas too rough or too steep for machine mowing, vines or native shrub ground covers should replace grass."

It is believed that all these basic considerations and conclusions are applicable today as they were then. But I would like to explore further the desirable characteristics which enter into the choice of ground-cover plants, first from the standpoint of slope erosion control and secondly for planting in median strips and intersection islands.

The following qualifications - and the order of their listing is not necessarily conclusive - should receive consideration by personnel responsible for choosing ground-cover plants for erosion control:

1. Plants must have the ability to thrive under existing physical conditions of soil, moisture, and exposure. Thus native species generally deserve preference over exotic or introduced species.

2. Thicket or mat-forming plants, those that root from decumbent branches, or those that spread from suckers or root shoots, should be given preference as they normally are the most valuable in holding soil in place.

3. Rapid-growing species should be favored as they will provide slope protection sooner than slower-growing species.

4. Evergreen plants, and bushy, dense-foliaged plants should be given preference as they afford the greatest soil protection against both wind and rain.

5. Plants producing the most litter with the greatest water-holding capacity are the most effective for controlling erosion.

6. Resistance to fire or ability to coppice after burning or cutting are valuable attributes as they enable plants to maintain a cover otherwise easily destroyed.

7. Avoid plants not resistant to insect damage or disease.

8. Avoid plants with conspicuous flowers or fruits as they are more subject to vandalism and may develop traffic hazards.

9. Avoid plants so vigorous and aggressive in growth as to crowd out more desirable species or become a pest to agriculture.

10. Do not use plants which are secondary hosts to economically injurious plant diseases or insects.

11. Do not use plants which are poisonous or irritating to the skin of man.

Likewise there are certain qualifications that pertain in the choice of plants for planting on median or intersection islands.

1. Like erosion-control ground-cover plants, they should be adaptable to the site.

2. They should be available at a reasonable cost.

3. They should be long-lived.

4. They should be capable of furnishing the required cover in a reasonable period of growth.

5. They should be durable to occasional foot or vehicular traffic and possess quick recovery characteristics.

6. They should be neat in their appearance and growth habits.
7. They should not increase fire hazards.
8. If introduced plants are chosen, they should conform in character to native plants growing in the area.
9. They should not be of an ultimate height that will restrict sight distance.
10. Their height should not be such as to cause snow drifting, where that problem is germane.
11. They too should be resistant to disease or insect injury.

With respect to planting, particularly on median strips and intersection islands, I would like to provoke a discussion on a minimum width acceptable for planting. Irrespective of the experience of two states who reported discontinuance of the use of ground-cover plants, I believe that we are generally in agreement as to their beneficial use for the control of erosion and for reducing maintenance costs as stated in the previous report of your subcommittee on plant ecology. But is it not true that the use of ground covers in median strips--in narrow median strips--and in intersection islands also is instrumental in giving better traffic direction and separation and, therefore, is an important contribution towards greater highway safety?

In principle, I would agree with the accepted premise which holds that planting should not be considered in median islands less than 6 feet in width; but, where right-of-way limitations prohibit these widths, we have, in practice, planted ground-cover types of plant material in islands with only 3 feet of planting space. This has been done at the specific request of our design engineers, to conform with their desire to obtain a material giving greater contrasts between the surfaces of the median island and the adjoining pavement. Plants furnish this contrast by their height, color and texture of foilage. Admittedly, these plantings have been made in sections having favorable growing conditions. Our observations, which cover only a period of two years, fail to show any discernible difference in growth between those planted in the narrow median strips and the same species planted in median strips up to 12 feet in width.

Even if we are forced to additional maintenance costs, such as watering under less favorable growing conditions, or because of the restricted growing space, I believe those costs are justified if the results desired are obtained. If we can afford curbs, contrasting pavements, and lighting in prominent intersections, is not an increased maintenance cost in growing plants justified in the same location? Additional study and observation of the benefits versus the cost of maintaining plantings in narrow median strips is believed warranted if the premise is true that better direction and greater traffic safety are thus obtained.

(See Appendix for List of Ground Cover Plants for Highway Planting)