programs has changed radically in just 2 years. The county, and state highway departments. Where aerial Carbide has developed application equipment to apply currying in the Eli-Lilly Company. However, he re­
coming more essential for a successful program. Wobbler, are currently being commercially de­
veloped. These devices can apply herbicides and

A.T. Perkins

Perkins presented the new developments that are oc­
curring in the Eli-Lilly Company. However, he re­
quested that no information be published at this time in accordance with company policy.

FUTURE IN CHEMICAL ROADSIDE VEGETATION MANAGEMENT
Roy R. Johnson

Union Carbide Agricultural Products Company has de­
veloped and is marketing many herbicides for the management of grasses, broadleaf weeds, and brush that grow on highway rights-of-way. Along with these herbicides and plant growth regulators, Union Carbide has developed application equipment to apply herbicides uniformly and with a minimum of drift. The Directa-Spra is widely used by municipal, county, and state highway departments. Where aerial application is feasible, the Microfoil boom provides accurate application with little drift potential. Two new devices, the Spirometer and the Mini­Wobbler, are currently being commercially de­
veloped. These devices can apply herbicides and plant growth regulators to highway vegetation in a swath of up to 50 ft from the spray vehicle without using a boom and at forward speeds of 10-15 mph. Typical spray volumes are 25-50 gal/acre. These ap­plication devices were used to treat several thousand acres in 1980. Use on typical highway sites will be investigated in 1981.

FLEXIBILITY IN ROADSIDE VEGETATION MANAGEMENT PROGRAM
C.W. Middleton

Major challenges concerning inflation and energy use that we all talk about are opening the door to a number of significant changes. Many of these chal­lenges are related to the optimum use of a changing budget and are concerned with such areas as holding mowing cost down and vegetation problems that occur with reduced mowing.

Today's planning of highway chemical prescription programs has changed radically in just 2 years. The flexibility and ingenuity of tank mixes are also be­coming more essential for a successful program.

Two years ago, the industry had three flexible materials that were either premixed or tank mixed and were used with other industrial products such as Hyvar, Spike, Krenite, Embark, and MSMA. These last three were used in every season of the year. Now 2,4,5-T is no longer available from Velsicol or other suppliers for right-of-way use. Two broad spectrum chemical tools are left for selective weed and brush control: 2,4-D and Banvel (Dicamba). These two materials are flexible in many common use situations: highway (including ditch bank label­ing), utilities, home lawns, corn, pastures, range­land, railroads, forestry, aquatic, watersheds, soil sterilant, and brush control. 2,4-D is used in selected herbicide materials as a tank mix with Princep for weed control in field asphalts such as RC, MC, and sc. This later program is more economical than the long control of Prami tol 25E under highway shoulders, is a very economical

Anthony Stacha

Ciba-Geigy markets a number of products that are used in roadside vegetation management programs in the United States. These product formulations are Pramitol 25E, Primitol 5PS, Atratol BOW, Atratol BP, Atratol Nine 0, Princep 4L, Princep 80W, and Princep Caliber 90. Due to the di­versity of weed problems and rainfall in the United States, the uses of these products vary from com­plete bare ground control chemicals in some areas to selective control of undesirable species depending on rates used.

Princep has been used for a number of years in the western United States for selective control of broadleaf weed control in Bermuda grass along the roadsides.

My experience in Texas has been centered around the application of Pramitol 25E under asphalt shoul­ders to prevent weed and grass encroachment. This use of Pramitol 25E considerably extends the life of these shoulders. Pramitol 25E (under shoulders) can be applied on the ground before laying asphalt by mixing 20-30 gal of Pritmotl in a minimum of 100 gal of water and uniformly spraying on a well-prepared surface. Pramitol 25E may also be applied at the same rate and may be mixed directly with the cutback asphalts such as RC, MC, and SC. This later program can be applied by the contractor and requires no special equipment and labor. The only additional cost is the cost of the chemical. Tests have shown that the long control of Pramitol 25E under highway shoulders to prevent weed encroachment, thus extend­ing the life of the shoulder, is a very economical program and in some cases appears to double shoulder life.

Currently, registration is pending with the En­vironmental Protection Agency on Dual 8E alone and as a tank mix with Princep for weed control in field and linen grown woody ornamentals. The granting of this registration offers potential for Dual and