THE BEETLE TRACTOR

North Pacific Region—U. S. Forest Service

In various regions, during the past 10 or 15 years, there have been sporadic plans and trials aimed at machine maintenance of trails. On several forests in Region 6, small conventional tractors have been used to build or maintain "tractor trails." In general these turned out to be wider and more expensive both to build and maintain than the required service justified, and created drainage problems out of line with trail standards and costs.

In 1940, the Region 6 Trail Tractor was first used on heavy trail construction on the Siskiyou. It produced an excellent trail of satisfactory standard through difficult terrain at reasonable cost. The war interrupted progress on this network but work will be resumed in 1946 using the Clarkair military model developed by the Army from the original R–6 machine. Conclusions drawn from this project are that the 4,300-pound Clarkair is fully satisfactory for trail construction but larger and heavier than required for maintenance or for betterment and rehabilitation of existing trails.

As a result of experience with the 4,300-pound tractor, it was thought advisable to go to a still lighter machine for trail maintenance and betterment. In 1944 the equipment laboratory was requested to design a rugged, heavy duty unit not over 27 inches in

Wide gage beetle tractor with Wescoatt plow.

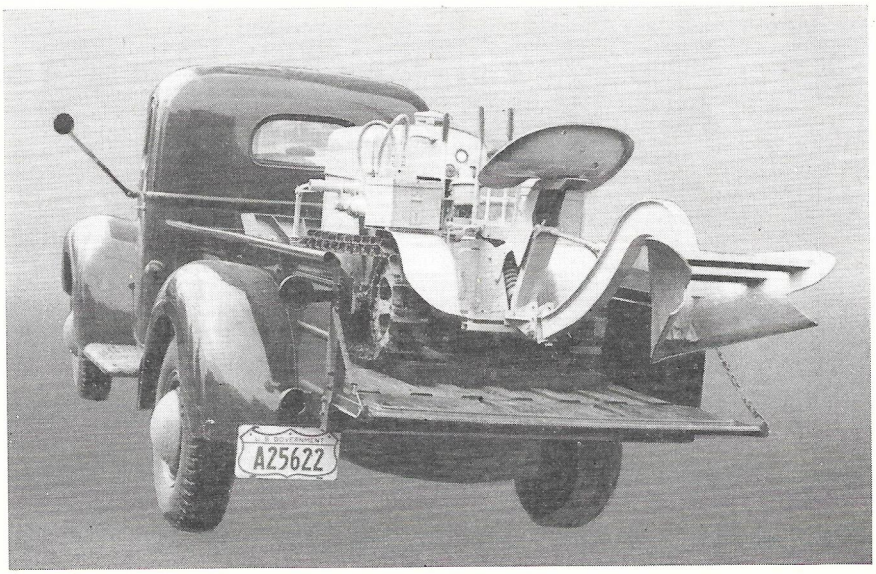
tread width, 84 inches long, with full hydraulic bulldozer, ample power, and light enough to be hauled in a pick-up. It was specified that basic tractor design should be followed insofar as practicable and commercial assemblies utilized to simplify parts procurement and repairs.

The equipment laboratory proceeded in line with the above general specifications. Design of the tractor was completed in December 1944, and plans turned over to the Portland departmental shop for fabrication. The pilot unit was finished in June, 1945. In order to differentiate it from other small machines it was christened the "Trail Beetle," which seems reasonably appropriate in view of its size and general appearance.

Beetle No. 1 was started out on the Clackamas River district of the Mount Hood. Work included removal of slough, windfalls, rocks and roots, widening narrow spots, rebuilding switchbacks to 6-foot radius, removal of puncheon and turnpiking wet spots, replacing bridges with fills, and other miscellaneous work ordinarily included in annual trail maintenance. During the course of the tests more than 20 miles of old trails were worked over and the machine was not "eased along." On the contrary, to determine weaknesses of design it was frequently put into situations beyond its capacity. Practically none developed. Results on trail rehabilitation were, in general, excellent.

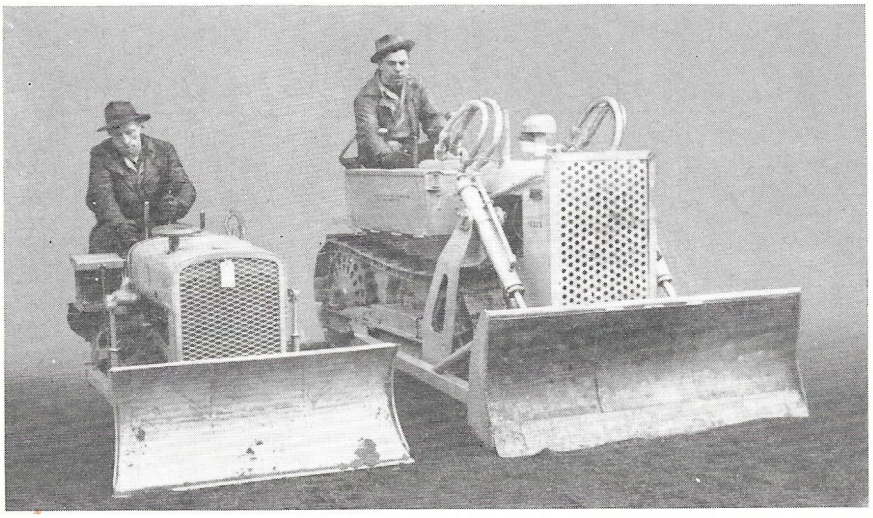
Plans are now under way for procurement from commercial sources of the beetle tractor with spare parts and it is hoped they will be available for the 1946 season.

This machine is primarily a trail worker but its small size and light weight offer fire-control possibilities in initial attack, and supplementing hand work until larger tractors can be delivered to the fire.



Wide gage beetle tractor loaded in pick-up.

Two narrow gage (27½-inch) beetle tractors are now available for use. A third, wide gage (32¾-inch) machine is undergoing tests for fire line construction. It now is equipped with a small Wescoatt plow. A disk plow will also be built and tried out behind it. In addition, it is planned to design a rotor attachment for trial use with this tractor.



Comparative size of the 1,800-pound 27½-inch gage trail beetle and 4,300-pound Clarkair.

Specification—Beetle Tractor

	Narrow gage (trail use)	*Wide gage (fire use)*
Weight, without bulldozer—pounds	1, 500	1, 530
Weight, with bulldozer—do	1, 800	1, 850
Over-all width on tracks—inches	27½	32¾
Over-all track length—do	51	51
Length of track on ground—do	36	36
Width of track plates—do	5¼	5¼
Width of bulldozer blade, straight—do	43½	50½
Width of bulldozer blade, angled—do	37	45

Over-all length with bulldozer, exclusive of seat overhang	82 inches.
Seat overhang	22 inches.
Motor, make	1 CK Waukesha, gas.
Motor, horsepower	12–14 b. hp.
Drawbar	1,600 pounds—10 hp.
Speeds, m. p. h.:	
Forward:	
First gear	1. 69
Second gear	2. 68
Third gear	4. 91
Reverse:	
First gear	2. 19
Second gear	3. 41
Third gear	5. 60
Average gasoline consumption, per hour	¾ to 1 gallon.