FIELD PLOT STUDIES WITH SAWDUST
FOR SOIL IMPROVEMENT †

by STUART DUNN, L. P. WOLFE JR. *), W. A. MACDONALD *)
and JOHN R. BAKER *)

New Hampshire Agricultural Experiment Station Durham, N.H., U.S.A.

The use of wood wastes as sources of soil humus has received increasing attention of late years. This is largely because the usual crop rotations seldom maintain soil humus at the highest desirable level and because the increased mechanization of agriculture has made animal manures less abundant and often more costly. The chief form of wood wastes thus tested has been sawdust, although other forms, such as chips, usually have similar effects.

The literature on such use of sawdust has been quite adequately reviewed by Allison and Anderson 1). Most investigators have found that fresh sawdust requires the application of liberal amounts of nitrogen to secure good crop growth but that sawdust is often beneficial to some soils, particularly after the initial drain on the nitrogen supply has somewhat lessened. Comparatively little information is available on use of partly decayed or rotted sawdust.

In order to determine something about the potentialities of rotted sawdust as compared to fresh sawdust and to farm manure in improving a poor soil these field plot tests were undertaken.

EXPERIMENTAL METHODS

The plots were located on a level area near the Agricultural Experiment Station at Durham, N.H. The land had not been under cultivation for over 15 years. The soil type was a Merrimac loamy

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coarse sand, and was very uniform throughout the area. Tests showed it to be very low in all of the principal plant nutrients. The soil pH averaged about 5.5. For the first year two groups of plots were used; one containing 17 plots and the other 12 plots. For the remaining period of three years the 17 plot field was not used and the 12 plot field was enlarged to contain 20 plots. The size of each plot was 95 feet by 15 feet, or about \( \frac{1}{30} \) acre. The variables tested were four: (1) rotted sawdust, (2) fresh sawdust, (3) manure, (4) control (no organic matter). This allowed a replication of each treatment seven times the first year and five times the other years. The replications were laid out in a randomized block system.

The experiment was started in the spring of 1948. The land was first plowed, then 950 pounds of 10–15–10 complete fertilizer, 350 pounds of magnesium sulfate and 1500 pounds of hydrated lime was spread uniformly over the plot area. The plots were marked out and applications of sawdust and manure were made as follows: In all, 9 truckloads of fresh sawdust (coniferous) weighing 50,130 pounds or approximately 25 tons were applied, and 9 loads of rotted sawdust (coniferous) weighing 65,700 pounds or 32.8 tons. This would amount to an application of 5.6 pounds of fresh sawdust per square foot or 121.9 tons per acre and 6.0 pounds of rotted sawdust per square foot or 130.6 tons per acre. The volumes of these two were nearly equal as indicated by the number of loads but because of greater moisture content the rotted sawdust weighed more. The rotted sawdust was obtained from a large pile that had been standing for 10 years. An effort was made to spread both kinds of sawdust at a uniform depth of 3 inches and to allow a one foot margin at the edge of each plot. Subsequent harvest data were arranged to omit the yields from the border rows so as to avoid the marginal influence on the results.

The manure was spread at a rate of one load per plot, each load weighing approximately 3 tons. Therefore, about 24 tons of manure were applied to 8 plots. The 17 plot field was assigned one extra plot of manure the first year to take care of the uneven number of plots.

The land was harrowed by disk harrow twice; once before and once after spreading the sawdust and manure. Then the fertilizer was spread and the land harrowed with a rigid tooth harrow.

In the spring of the second year when the 12 plot field was enlarged to 20 plots, applications of the sawdust and manure to the additional plots were made at the same rates as above. No other