

# Knowing the Basics Helps the New Gardener Get the Most Out of His Rotary Tiller.

William J. Schlapman, General Manager  
JI Case Company  
Outdoor Power Equipment Division



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Can we learn something about operating modern garden tilling tools by harking back to the horse and plow? I would have to answer that with a rather emphatic "yes!"

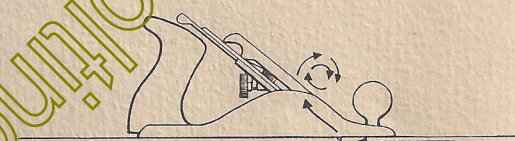
With today's expanded interest in "growing your own" and the thousands of first-time users of tilling equipment, learning or re-learning the basics of moving the earth is particularly timely. Knowing the correct procedures in operating tilling equipment can turn gardening from a chore into a pleasure. And the operator will have a sense of doing a good job the first time.

We can use both a walking plow and the carpenter's hand plane (Illustrations 1 & 2) to graphically show the proper operation of a rotary tiller in preparing a seedbed. A plow, working together with "ole Dobbin," is a good example of the relationship of motion to work output--something frequently overlooked by the new operator to today's garden tractor.

The plow exerts little down pressure and has a very nominal weight. But it does, in fact, move a tremendous amount of earth. The two keys to its output are motion and operator direction.



[Illustration 1]



[Illustration 2]

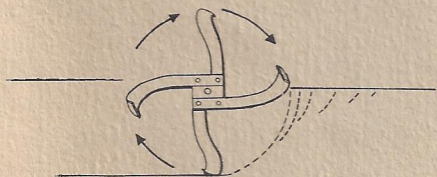
To turn a furrow, the plowman starts at the edge of the field, raises up slightly on the handles to direct the plow point downward, commands the horse to start and as the plow moves forward it penetrates the ground. Upon reaching furrow depth the plowman levels the handles and an approximate balance is then maintained between the plow and the ground, with a continuous furrow turned as long as the horse walks forward. At the end of the furrow the plow handles are lowered to direct the tip out of the ground again. All

movements are gradual, dependent upon forward motion and the operator's control throughout.

What does the hand plane have to do with proper operation of a rotary tiller?

Those of us who have done a little carpentry know when planing soft pine you can set your blade for a deeper cut than if you are working with hard maple. Thus the planing operation does illustrate the relationship between available force (whether arm muscle or horsepower) and resistance to the work being done (hard maple vs soft pine).

The same basic illustrations of the plow and plane can be related to in observing, judging and controlling the operation of a rotary tiller preparing a seedbed, even though the tiller blade rotates in an arc instead of moving in a straight line.



[Illustration 3]

The important factor in tilling is the forward speed of the pulling vehicle in relationship to the RPM's of the tiller. Each turn of the tiller (Illustration 3) is like a cut of the plane with the thickness of the cut determined by the forward motion of the vehicle. If the vehicle is operated too fast or the tine rotation slows down, the relative amount of cut is increased, with the tines having more difficulty making their cut.

As each succeeding revolution of the tiller makes an increasingly thicker slice the tiller slows down under the work load. If forward motion is too fast for soil conditions, the tines climb out of the ground from the desired depth to a point where ultimately they act like a paddle wheel propelling the vehicle with minimal penetration as shown in illustration 3. Therefore, it is important for the operator to constantly monitor the rotational speed of the tiller tines and adjust the vehicle's forward motion accordingly.

On a fixed speed tractor or walking tiller the proper transmission gear must be selected to correlate with the tiller tine speed and soil conditions. A variable speed hydraulic or hydrostatic drive tractor offers

an opportunity for the operator to set the forward speed of the vehicle in proper relation to soil conditions. With the hydro drive tractor there is also the opportunity for a slight reverse holding action in very demanding soil tilling conditions. Thus, the hydrostatic or hydraulic drive tractor, with its infinite control of forward speed, offers a superior power vehicle for tilling but is dependent on the operator to utilize that range.

New users may expect that just a single pass with a tiller is sufficient for seedbed preparation. In most soils two or more passes will be required before the ground may be properly worked up. In the case of the hand plane, repeated strokes are usually necessary to reach a desired finish on the wood. With hard wood many strokes might be necessary while in soft woods, only two or three might do the job.

The same holds true with the tiller. On hard grounds, two or more passes will usually be necessary before a good seedbed is ready. In softer soils one or two passes might do the job. One pass may be sufficient for cultivation or weed control.

A **criss-cross work** pattern will also help in preparing a better seedbed. For example till the length of the seedbed first, then till it crossways, along the width. This will greatly aid in making the smoothest and most finely prepared soil for the seedbed.

I want to stress one final point, that of having the right machine for the job. As the gardener would not till an acre or more with a small machine, neither should he till the soil with a tractor that is not properly outfitted. **Rear wheel weights and even chains are recommended by most manufacturers for tilling operations.** These provide the tractor **increased traction** and will also retard the pushing action of the tiller.

**Front weights can also be crucial in keeping the front tires on the ground. Without them a complete loss of steering ability is possible.**

In summary, knowledge and practice of basic fundamentals can increase the operator's performance and work accomplishment. For the new gardener it all adds up to more pleasure and confidence in using his earth moving tools.