

Construction and Use of a Simple No-Till Post Direct Sprayer

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Weed control is one of the most important and probably most difficult aspects of row crop production. There are two times to control weeds -- before they emerge from the ground and after emergence. The purpose of this paper is to describe the construction and use of a simple post-direct sprayer.

Herbicides are normally applied prior to crop emergence to kill germinating weed seeds or emerging seedlings. These preemergence herbicides do not give season long control of weed species but are normally effective only for four to six weeks after application. During this period of time, the crop has become established, grown, and hardened to some extent while the later emerging weeds are still young, succulent, and more susceptible to mechanical or chemical injury. A height differential between the crop and weed is also established.

A crop planted no-till can be mechanically cultivated for weed control but it is a difficult task and also breaks the existing herbicide layer. As a result, post emergence chemical weed control is the preferred method. Post emergence herbicide application can be accomplished by two methods: (1) by spraying non selective herbicides to the base of the crop plant with complete coverage of the weed plants between the rows, or (2) by spraying over the top of the crop a very selective herbicide that kills specific weeds but has a minimal effect on the crop.

The over-the-top treatment has the advantage of ease and speed of application but in many instances is inefficient and expensive. Over-the-top materials are normally very effective but also very selective in the seed species that they will control and dependent on the stage of growth of the weed. Some of the newer materials have restrictions limiting other chemicals with which they can be mixed. Some mixtures inactivate or inhibit activity of one or both of the components or the combination will adversely affect the crop. The expense of over-the-top materials (approximately \$20 per acre) is another major consideration. Post directed spraying is advantageous because non-selective herbicides can be used. It is relatively inexpensive and does little or no damage to the growing crop and, if applied correctly it will control all small weeds between the rows. The major disadvantage is that post directed spraying is considerably slower than spraying over the top materials.

Post directing of herbicide is done with many types of machines ranging from expensive models with shielded spray and other refinements made by manufacturing companies to home built rigs with nozzles attached to old cultivator frames. Most of these machines and modifications are very effective but some

are expensive and others cumbersome and hard to calibrate.

Having used commercial sprayers for a number of years the author sought an easier, more efficient and cheaper way to post direct no-tillage planted crops.

Sprayer Description

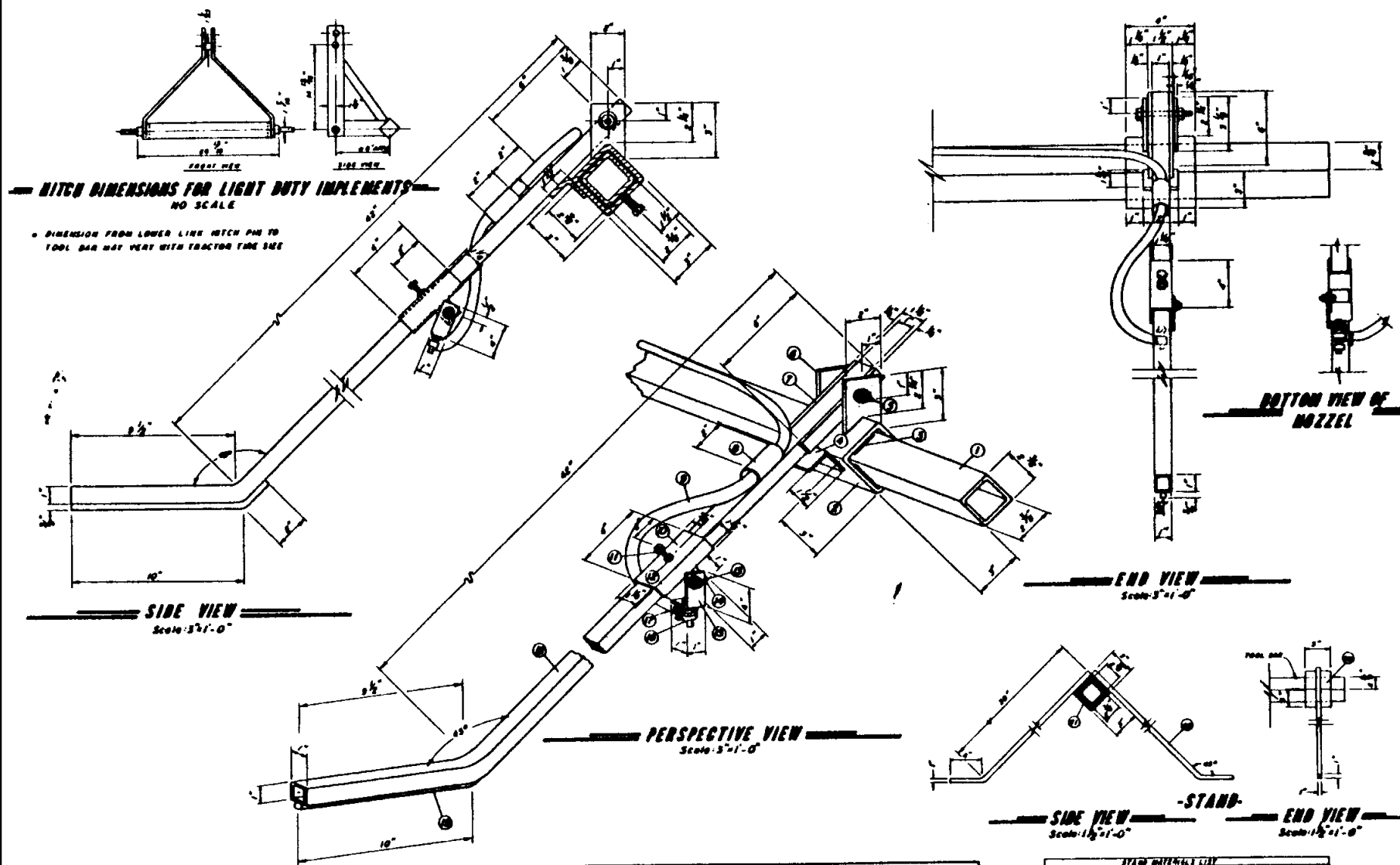
Construction is of relatively light square steel tubing mounted on a hollow three inch diamond tool bar. It was built with five "legs" to cover four crop rows. For best results, this sprayer should be constructed to cover the same number of rows as the planter. Each leg is constructed as a separate unit so each can be moved along the tool bar for various row widths. A diagram of the sprayer is included, details of construction can be obtained from the author.

This design is very flexible, and these specifications can be used as a guide for fitting legs on any toolbar. Pipe can also be used for the frame-work and legs, but rotation of the parts can make adjustments difficult.

The main advantages of this design are low cost and efficiency. The smoothly rounded drag shoe with wear bar does not drag up residue. Placing the nozzle above the residue protects it from fouling by vegetation. The spray pattern may be slightly disrupted by residue such as high wheat stubble, but this does not appear to affect weed kill. Locating the nozzle in the center of the row reduces the likelihood that the nozzle will contact the plants in the row.

For wider rows (30"-40") flood type nozzles are used, but as rows narrow to 20" or less flat fan nozzles may be mounted to give a narrower band and still stay above the residue. The outer leg on either side should use a 1/2 rate nozzle. This reduces the amount of herbicide applied on each pass and prevents doubling the recommended rates on outside rows.

Nozzle height can be adjusted by two methods: (1) height of the tool bar, and (2) the nozzle height adjustment on the leg (part no. 10). A height is selected for the toolbar which allows the legs to flex up and down freely but is high enough to clear the crop. The nozzle mount is then slipped up or down the leg to obtain the desired spray coverage. This gives a base spray coverage; however, the toolbar can be lowered while spraying an area where the crop is shorter than average to reduce the width of the spray band and keep herbicide off the smaller plants.

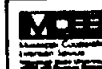


MATERIALS LIST											
PART NO.	SIZE	DESCRIPTION	FOOTAGE	SZ INCH	EIGHT	PART NO.	SIZE	DESCRIPTION	FOOTAGE	SZ INCH	EIGHT
1	2" x 2" x 1/4"	TUBULAR STEEL TOOL BAR	10 FT	20 FT	20 FT	11	1/2" DIA 1/4"	BOLT	3	7	0
2	2" x 2" x 1/4"	TUBULAR STEEL	3	9	9	12	1/2" DIA	NUT WELDED TO PART NO 10	3	7	0
3	2" x 2" x 1/4"	PLATE BAR FOR BUSHING PLATES	10	14	10	13	1/2" DIA x 1/4"	BOLT w/ WATERSHED NUTS	3	7	0
4	1/2" x 1/4" x 1/4"	ANGLE IRON 1" LONG	3	7	0	14	1" x 1/2" x 1/4"	ANGLE IRON 1" LONG	3	7	0
5	1/2" DIA x 1/4"	BOLT w/ WATERSHED NUTS	3	7	0	15	1" x 1/2" x 1/4"	ANGLE IRON 1" LONG OR 2" x 1/2"	3	7	0
6	2" x 2" x 1/4"	TWO EACH ROW	10	14	10	16	-	SPRINGER WHEEL, FLOUNDER OR WHEE	3	7	0
7	1" x 2" x 1/4"	TWO EACH ROW	10	10	10	17	-	SPRINGER WHEEL CLAMP	3	7	0
8	1/2" DIA x 1/4"	NUT USED TO FIT SPRINGER WHEEL (100 LBS)	3	7	0	18	1" x 1/2" x 1/4"	TUBULAR STEEL 12" LONG	3	7	0
9	-	SPRINGER WHEEL (100 LBS TO FIT)	-	-	-	19	1/2" DIA x 1/4"	BAR STEEL OR ROD FOR SPRINGER WHEEL	3	7	0
10	1/2" x 1/4" x 1/4"	TUBULAR STEEL 1" LONG	3	7	0						

STEAM MATERIAL LIST			
PART NO	SIZE	DESCRIPTION	QTY
20	3" x 3/4"	FLANGE STEEL	3
21	4" x 3/4"	PLAT FOR ENDING PLATES	4
22	1" x 1"	FLANGE STEEL 80' LONG	4

PL NO. 6209-

SIDE NOZZLE MOUNT FOR POST DIRECT SPRAYING



DESIGN BY	CARL NOVERMAN & NEAL WILCUTT
DRAWN BY	JERRY BUSHMAN
DATE	SEPT. 21, 1964

SHEET 1
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