

TRI-BAND APPLICATION

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Abstract

Tri-Band Post Directed Spray application is not new. As early as 1960, the technique of dividing the chemical band into three separate bands and applying selective and non-selective herbicides accordingly, was practiced in the Mid South. At the time, DSMA was the only selective spray available for early row band application. Diuron was available for six inch cotton. These two selective herbicides were applied to the drill band and arsenic acid or dinitro to the shoulder area. Unfortunately none of these herbicides were labeled for post directed spray, consequently, little enthusiasm was generated for this application technique. With the advent of over-the-top herbicides there is now renewed interest in Tri-Band application. This interest stems from the desire to reduce weed control cost but more importantly, to improve weed control. Reducing weed control cost is a matter of narrowing band width and making early and precise applications. Improving weed control is a matter of applying the right chemical at the right time and using the right equipment. When using the right equipment, if the right chemical is applied at the right time, both reduced cost and improved control may be expected.

Other than seed placement, the word "precise" is not often used in describing field operations. For Tri-Band application, or for that matter any post directed band application, maintaining preciseness in the horizontal plane is important. Maintaining preciseness in the vertical plane is even more important. To be precise in the vertical plane requires that the nozzles be mounted on a very stable, free-floating, parallel linkage unit that is gauged from the shoulder area. To be precise in the horizontal plane requires a reliable guide system.

For a successful Tri-Band application program, a mechanical guidance system, a parallel acting applicator, and a dual spray system is the right equipment. The right time for the first application is two to three inch cotton and for the second application five to six inch cotton. The right chemical depends on specific weed problems.

Introduction

Tri-band application is dividing the row band into three separate bands. The center band is referred to as the row band and the adjacent two bands are referred to as the shoulder bands. Selective and relatively expensive

herbicides are applied to the row band and non-selective, with good residual and relatively inexpensive herbicides, are applied to the two shoulder bands. Where perennial's are present, herbicides such as Glyphosate may be applied to the shoulder bands.

Other than for mechanical weed control, weed control cost so much per inch of band width. The wider the band the more it cost. This is true whether chemicals are used or hand labor. Among recommended herbicides, cost per inch of band width may vary two or three times with little difference in control. The difference in cotton tolerance, however, can be significant.

Tri-band application allows the operator to treat herbicides as individual tools. As an example an over-the-top selective herbicide is applied to the row band at the two to three inch stage of growth. The row band is six to seven inches wide. Simultaneously, maximum rates of Bladex and MSMA are applied to the shoulder bands. At the five to six inch stage, Caparol plus MSMA is applied to the row band and Roundup plus 32% Nitrogen solution to the shoulder band. These are only examples of the flexibility that Tri-Band application offers.

To realize fully the benefits of Tri-Band application requires a reliable guidance system, a precision band applicator, dual spray systems and a precision cultivator. These are the four subjects that will be addressed.

Reliable Guidance System

There is nothing more worthless than a guidance system that guides only sometimes. Once you are equipped to use a guidance system, it must guide at all times. Because of the practicability and economy of a mechanical guidance system, this type system is recommended with the following provisions:

A. **Guide Tracks** - Whether established before or during planting, guide tracks must be deep enough and shaped to conform to the guide wheels. Guide tracks must be established in firm ground. This requirement makes it especially attractive in minimum till or no-till programs. When establishing guide tracks, the guide shoe must be mounted on parallel acting linkage and independently gauged. Guide tracks must be established after knocking down the row. Guide tracks may be established to guide all tool bar mounted operations, the tractor, a self-propelled sprayer, or a cotton picker.

B. **Guide Shoe** - The guide shoe consist of a point and shaper that conform to the shape of the guide wheels. The guide shoe establishes the guide tracks and maintains the tracks during the season. The guide shoe is mounted on parallel linkage and must be independent of any ground engaging tool such as a cultivator sweep.

C. **Guide Wheel** - When establishing guide tracks, either the tool bar only may be guided or the tool bar and the tractor. If the tool bar only is guided, the tractor sway blocks must be adjusted so as the tool bar may act independently of the tractor. If both tractor and tool bar are to be guided, the sway blocks remain in their normal position. The prerequisite for guiding the tractor are single ribbed or three ribbed front tractor tires. This rules out guiding four (4) wheel drive tractors.

The Tool Bar Guide Wheels may be single ribbed sixteen inch rubber tired wheels or twenty four inch steel wheels for guiding ground engaging tools. Twenty inch steel wheels may be used for guiding surface running tools such as spray hoods or post directed applicators.

D. **Guide System Thumb Rules**

1. Do not try to economize in guide system components. Use only proven components. The returns are measured in chemical savings and improved weed control. They are not measured in the relatively small investment required for a reliable and proven guide system.
2. Check and double check all measurements. Incorrect measurements is the most common of all errors.
3. Establish guide tracks in firm ground and after knocking down rows.
4. A properly implemented guidance system will hold row crop operations within an inch. For example, in the case of replanting, it is nothing more than expected for the replanted seed to be exactly in line with the original planting.

Precision Band Applicator

The guidance system provides horizontal control. Horizontal control keeps the nozzles precisely centered on the row provided the nozzles are mounted on a stable unit that is free from side play. Horizontal control, however, is only half the control necessary. Vertical control is as important as horizontal control. To obtain vertical control, the following applicator design features are considered minimum:

A. **Parallel Linkage** - To preserve the integrity of band width, regardless of terrain, the nozzles must be mounted on parallel linkage. For any row crop operation, whether it be planting or spraying, free-floating parallel linkage is a prerequisite for preciseness.

B. **Gauge Wheels** - Are positioned adjacent to the row and nozzles are positioned in close proximity to the gauge wheels.

C. **Freedom From Side Play** - This is essential. Regardless of how reliable the guide system may be, if the applicator is not guidable, the results will be disappointing.

D. **Hooded Shoulder Nozzles** - The shoulder nozzles must overlap preferably an inch on each side of the row band. If the row band is only six inches wide, this means that the shoulder nozzles must spray within two inches on each side of the cotton plant. If herbicides are being applied to the shoulder bands that are not recommended for that stage of plant growth, it may be necessary to hood the shoulder nozzles. When applying herbicides such as Glyphosate or Paraquat, shoulder hoods will be required regardless of plant stage.

E. **Shoulder Disc** - In lieu of herbicide applications, the shoulder bands may be controlled mechanically. For the first application, shoulder disc that are gauged from the shoulder are the preferred tool.

F. **Bill-Jim Sweeps** - For the second application, shoulder sweeps are preferred. Bill-Jim Sweeps are designed to plow shallow close to the row and deeper at the sweep tips. The difference in depth from the sweep fin to the tip is one inch.

Dual Spray System

Unless shoulder bands are controlled mechanically, dual pumping systems are required. Finding a practical place to mount tanks for the second spray system is often a problem. One solution to the problem is mounting a tank on the front side of each end of the tool bar. Although there is a limit, the front mounted tool bar tanks serve as a counter balance to rear mounted tools. Tank capacity may be increased without exceeding tractor lift capacity. For folding tool bars, off set tank brackets may be used.

There are several combinations of pump systems available. Selecting two pumping systems is usually a matter of preference.

Precision Middle Cultivator

To complement precise row operations, a precise middle operation is necessary. Whether it be till or no-till, the unit controlling the middle must be very stable and must lend itself to reasonable ground speeds. Getting over in a timely manner is necessary for effective and economical control. Flex Tip Wing Sweeps in combination with pre-set shoulder disc, allows high speed, shallow cultivation of the middles and optimum overlap of the shoulder bands.

Summary

Tri-Band application provides a simple means for improving weed control and significantly reducing weed control cost. Although a reliable guidance system is deemed essential for Tri-Band application, it should be equally important for any post directed spray application.

To maintain the integrity of the bands, a precision applicator that is gauged from the row is necessary. For conventional application, preciseness in application is as much needed as in Tri-Band application. For maximum results at the least cost, it has always been and will always be necessary to apply the right chemical, in the right equipment, and at the right time. This is true whether it be Tri-Band application or single band application.