

RESPONSE OF NO-TILL WHEAT TO BURNDOWN AND POSTEMERGENCE APPLICATIONS OF 2,4-D AND DICAMBA

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Introduction:

2,4-D and dicamba are examples of growth regulator herbicides that can cause significant wheat injury when applied at the wrong time. The traditional application timing of these herbicides has been when wheat is in Feekes growth stage 5 or when plants are fully tillered and just prior to jointing and are about 4 to 8 inches in height. This usually occurs around March to early April in Kentucky, and will vary depending on the environment and location.

Some wheat growers have expressed an interest in using growth regulator herbicides in the fall when certain problem weeds are more easily managed, but they are concerned with the risk of crop injury.

This objective of this study was to evaluate wheat response to fall burndown and fall postemergence applications of 2,4-D and dicamba and compare results to those from the traditional spring timing.

Methods:

Pioneer 25R35 was planted with a no-till planter into corn stalks October 23, 2004 at a seeding rate of 35 viable seeds per ft². The herbicides used in this study included 2,4-D ester (Weedone LV4 Solventless) at 1 and 2 pt/A and dicamba (Clarity) at 4 oz/A. Treatments were applied according to the following:

9/20/04: 4 Weeks Early Preplant (4 WK EPP)
10/3/04: 2 Weeks Early Preplant (2 WK EPP)
10/23/04: Premergene at Planting (PRE)
12/04/04: Fall Postemergence (FALL POST)
(wheat 1 tiller & 5" tall)
02/23/05: Spring Postemergence (SPRPOST)
(wheat 5 tiller & 6" tall)

Harmony Extra was applied at 0.5 oz/A and Warrior at 3.5 oz/A on March 17, 2005. Tilt at 4 oz/A was applied May 4, 2005. Nitrogen was applied as a split treatment at approximately 30 units/A on February 18, and 79 units/A on March 30, 2005.

The methods used for collecting data are summarized in footnotes of Table 1.

Results:

Wheat stands were similar for all of the 4 WK EPP, 2WK EPP and PRE treatments (See Table 1). Injury symptoms from any of the fall treatments were not visible during the fall or early winter. However, by early spring, some plants in the 2,4-D FALL POST plots began to show twisting of stems. Applying 2,4-D ester at 1 or 2 pt/A as a FALL POST treatment resulted in injury in the form of reduction of plant height, more abnormal seedheads, and lower test weight compared with the non-treated check. The reduction in head weight was another indicator of injury with 2,4-D ester applied at 2 pt/A as a FALL POST spray.

There was a limited amount of yield loss that occurred where 2,4-D ester was applied at 2 pt/A at planting as a PRE treatment and at 1 and 2 pt/A as FALL POST treatments to wheat with 1 tiller and 5 inches in height. The yields for the PRE treatment of 2,4-D at 2 pt/A and for the FALL POST treatments at 1 and 2 pt/A were 116.1, 116.1, and 115.1 bu/A, respectively, compared with 136 bu/A for the non-treated check.

Summary:

Fall sprays of 2,4-D ester at 1 or 2 pt/A to emerged wheat with 1 tiller have the potential to cause crop injury and limit yield. The only burndown treatment that limited wheat yield was the PRE treatment of 2,4-D ester applied at the high rate of 2 pt/A. Clarity (dicamba) at 4 oz/A did not cause crop injury or limit wheat yield regardless of timing of application.

These results show wheat has a greater tolerance to fall sprays of dicamba than 2,4-D, particularly when treatments are applied to seedling plants.

The perception of risk of injuring wheat with fall sprays of dicamba is largely based on earlier versions of product labels that limited the application to wheat immediately after winter dormancy but before jointing. Changes in the dicamba labels in recent years have allowed more flexibility to making fall sprays. The current labels allow applications to be made before, during, or after planting but before jointing. This research help support the potential use of dicamba in fall sprays as early preplant, preemergence, or postemergence to seedling wheat.

The fact that injury occurred with 2,4-D applied at planting and to seedling plants in the fall demonstrates the risk injury. This is one reason why labels of 2,-4D products do not address making burden or fall post applications in wheat.

Table 1. Effect of 2,4-D and Clarity on Growth and Yield Parameters of Wheat. (UKREC 2004-2005) ¹

Treatment			Plant Stand (Pl / ft ²) ³	Plant Height (Inches) ⁴	Head Count (No/ ft ²) ⁵	Head Wt (g/20heads) ⁶	Abnormal Head (%) ⁷	Test Wt (lb/Bu)	Yield (Bu/A)
Herbicide	Rate	Timing ²							
2,4-D Ester	1 pt/A	4 WK EPP	35	34	86	42.2	13	60.0	127.9
2,4-D Ester	2 pt/A	4 WK EPP	35	35	90	44.9	15	58.6	135.3
Clarity	4 oz/A	4 WK EPP	35	35	92	44.2	16	60.2	133.7
2,4-D Ester	1 pt/A	2 WK EPP	35	35	90	42.5	19	60.0	124.8
2,4-D Ester	2 pt/A	2 WK EPP	34	35	86	42.2	25	59.6	127.5
Clarity	4 oz/A	2 WK EPP	35	33	90	44.3	21	60.4	123.7
2,4-D Ester	1 pt/A	PRE	35	34	92	41.7	21	61.0	129.0
2,4-D Ester	2 pt/A	PRE	33	35	83	45.6	21	61.0	116.1 *
Clarity	4 oz/A	PRE	33	36	89	44.4	16	60.2	126.7
2,4-D Ester	1 pt/A	FALL POST	—	31 *	83	40.1	44 *	53.6 *	116.1 *
2,4-D Ester	2 pt/A	FALL POST	—	28 *	86	32.5 *	48 *	50.9 *	115.1 *
Clarity	4 oz/A	FALL POST	—	35	90	40.5	20	61.5	126.1
2,4-D Ester	1 pt/A	SPR POST	—	33	87	39.6	21	56.9 *	134.0
2,4-D Ester	2 pt/A	SPR POST	—	34	89	42.0	15	60.1	129.4
Clarity	4 oz/A	SPR POST	—	36	90	42.4	20	60.7	125.3
Non-treated Check			—	35	89	43.5	19	60.7	136.0
LSD (0.05)			NS	3	9	5.6	13	2.8	14.5

¹ An asterisk indicates a significant difference relative to non-treated check.

² Application dates: (4 WK EPP = 9/20/04) (2 WK EPP = 10/3/04) (PRE = 10/23/04) (Fall Post = 12/4/04) (SPR POST = 3/23/05)

³ Made 2 random counts per plot for stand counts on 11/05/04.

⁴ Took an average plant at two random sites and measured their height on 6/01/05.

⁵ Took head counts at 2 random sites/plot in an area of 36" by 7" and adjusted to 1 ft² on 6/01/05.

⁶ Collected 20 consecutive heads within a single per plot on 6/17/05.

⁷ Used the 20 seedheads collected for head weight and estimated the percent of heads that appeared to be small, twisted or had other anomalies.

⁸ Test weight measured with moisture meter.

⁹ Yield collected with a small plot combine on 6/20/05 and adjusted to 15% moisture.