1995

No Tillage Adoption in Grain Crops in Kentucky Counties in 1994

Gerald R. Haszler
University of Kentucky

Grant W. Thomas
University of Kentucky

UNIVERSITY OF KENTUCKY
COLLEGE OF AGRICULTURE
Lexington, KY 40546-0064

COOPERATIVE EXTENSION SERVICE

Department of Agronomy

Soil Science News & Views

Vol. 16, No. 6, 1995

No Tillage Adoption in Grain Crops in Kentucky Counties in 1994

G.R. Haszler and G.W. Thomas

The no-tillage system, where soils are neither tilled nor cultivated, has a number of advantages. Studies in Kentucky and in other states show much lower erosion under no tillage as compared with conventional tillage. In addition, fuel, machinery, and time savings are all impressive when the no-tillage system is used. There is also a tendency toward better crop yields due to higher water capture and/or conservation that is associated with the mulch of crop residues that is maintained on the soil surface in no tillage.

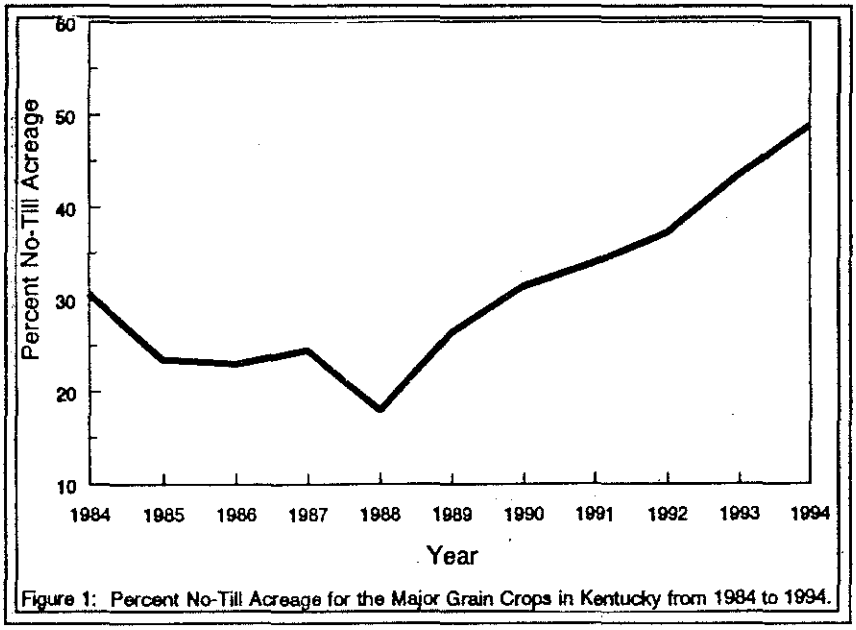

Figure 1: Percent No-Till Acreage for the Major Grain Crops in Kentucky from 1984 to 1994.

No tillage research and extension efforts in Kentucky date from 1962 when Shirley Phillips, then Agronomy Grains Specialist, did the first demonstration of the technique with Harry Young, a farmer in Christian County. Since then, the University of Kentucky has had, probably, the most integrated and consistent program in no tillage in the nation. Much of this consistency can be credited to Shirley Phillips and the rest to research and extension personnel and to interested and cooperative farmers.

Many problems arose in earlier years due to mediocre planting equipment, inadequate herbicides, and inexperienced farmers. A particular problem plagued no-tillage corn production until quite recently. Johnsongrass, fairly hard to control in any case, turned out to be exceedingly aggressive under no tillage, and, after a few years, set back adoption of the practice in corn severely.

On the other hand, wheat-double-crop soybeans, a system invented by farmers using no tillage planting of soybeans, was highly successful. Into this mix of disappointment and success were introduced better planters, extraordinary herbicides,

and new conservation initiatives. The latter, beginning with the 1985 farm bill, inaugurated a more aggressive campaign for soil conservation. No-tillage farming proved to be the most effective and least expensive strategy to accomplish these soil conservation initiatives.

In Kentucky, there already existed a long experience in no-tillage before the farm bill was enacted. The results of this experience apparently made the transition to no-tillage agriculture fairly easy: As Fig. 1 shows, since the mid 1980's, the adoption of no tillage in Kentucky as a whole has been rapid and shows no signs of slowing.

Fig. 2 shows the percentage of grain crops under no tillage in 1994. There are two explanations for the variation in use of no tillage between counties. The first, which explains the difference between the mountain counties and the rest of the state, has to do with the small quantities of crops produced in all the mountain counties. Small scale production cannot justify the change in machinery required to adopt no tillage in those cases. The second differentiating factor is soil drainage, particularly in western Kentucky. Counties with poorly-drained soils have had lower adoption of no tillage whereas counties with mostly well-drained soils have had very high adoption rates. A good example of this difference is seen in comparing the western coalfields with the adjacent Pennyrile counties.

Table 1 shows complete data for all counties and the % of corn, full-season soybeans, double-crop soybeans, and small grains produced in Kentucky under no tillage in 1994. The percentages are highest for double-crop soybeans, followed by corn and full-season soybeans. Small grain percentages are generally much lower than the other crops. The explanation for this probably lies in 1) the expense of buying small grain drills to plant wheat and barley by no tillage and 2) the perceived difficulty of planting small grains in voluminous corn stubble. Anyhow, it should be pointed out that very little tillage is practiced in wheat even when it is <u>not</u> no tilled. A disking or two is about typical and with the presence of large amounts of corn residues, considerable surface cover of residues still remains.

From the data of CTIC (1994) it is apparent that no tillage is an ever more typical method of growing our major grain crops. In several counties, 3 out of 4 acres are now planted in the no-tillage system and the trend shows no sign of changing. Kentucky leads the nation in % of grain crops produced under no tillage (Table 2) with more than 44%, closely followed by Tennessee and Maryland.

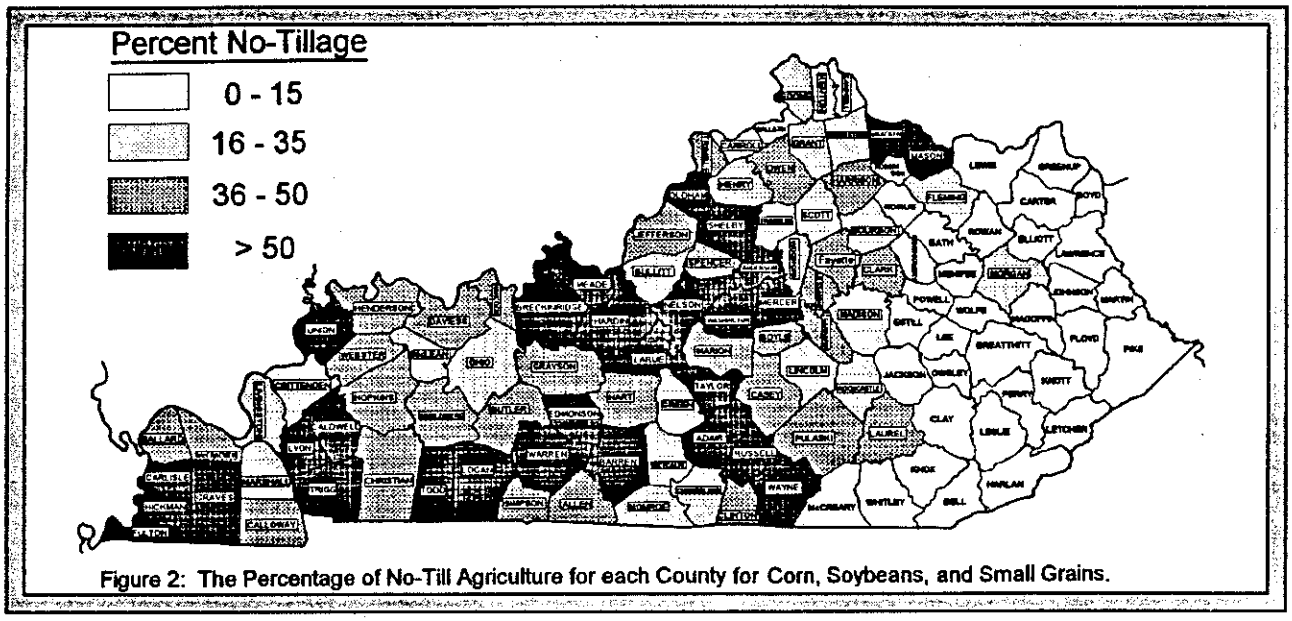

Figure 2: The Percentage of No-Till Agriculture for each County for Corn, Soybeans, and Small Grains.

Grant Thomas
Extension Specialist

Table 1. No-Till Planting of Corn, Soybeans, and Small Grains in Kentucky - 1994.

	Acreage of corn, soybeans and small grains			*% No-Till Planted*			
	Total Acres	*NT Acres*	*% NT*	*Corn*	*Soybeans Full Season*	*Soybeans Double Crop*	*Small Grains*
Adair	18,200	9,750	54	60	60	75	33
Allen	6,045	2,270	38	26	42	58	61
Anderson	3,250	2,100	65	68	50	0	0
Ballard	73,000	31,000	42	45	41	90	13
Barren	51,500	30,000	58	63	43	100	50
Bath	12,700	4,000	31	31	13	100	50
Bell	810	50	6	17	0	0	0
Boone	4,800	900	19	18	20	50	13
Bourbon	23,620	7,300	31	46	19	78	10
Boyd	514	0	0	0	0	0	0
Boyle	20,717	10,302	50	52	60	100	45
Bracken	1,420	880	62	65	25	0	0
Breathitt	1,440	50	3	4	0	0	0
Breckinridge	62,000	31,500	51	37	44	88	52
Bullitt	13,000	3,500	27	33	17	67	0
Butler	41,000	16,400	40	39	43	80	0
Caldwell	32,500	20,700	64	75	50	100	90
Calloway	107,500	51,260	48	50	25	96	10
Campbell	2,100	570	27	20	55	100	0
Carlisle	49,511	28,500	58	65	41	100	34
Carroll	3,050	600	20	36	7	0	0
Carter	2,225	25	1	0	7	0	0
Casey	22,500	8,350	37	40	26	88	28
Christian	162,000	80,500	50	60	17	95	2
Clark	10,000	4,400	44	64	60	100	3
Clay	1,300	0	0	0	0	0	0
Clinton	6,525	3,075	47	39	67	85	71
Crittenden	24,000	6,000	25	25	18	100	20
Cumberland	5,050	1,100	22	30	8	67	9
Daviess	166,000	81,000	49	50	50	75	8
Edmonson	8,700	4,400	51	50	50	100	40
Elliott	750	110	15	15	0	0	0
Estill	4,645	270	6	4	12	0	0
Fayette	10,400	4,200	40	58	29	0	0
Fleming	9,506	1,529	16	18	18	20	0
Floyd	560	0	0	0	0	0	0
Franklin	4,450	1,000	22	50	31	100	3
Fulton	92,000	53,500	58	63	48	96	48
Gallatin	3,575	150	4	10	0	0	0
Garrard	6,250	2,850	46	59	50	100	14
Grant	1,062	302	28	39	0	72	17

Table 1. Continued.

	Acreage of corn, soybeans and small grains			*% No-Till Planted*			
	Total Acres	*NT Acres*	*% NT*	*Corn*	*Soybeans Full Season*	*Soybeans Double Crop*	*Small Grains*
Graves	142,915	100,020	70	81	71	95	12
Grayson	34,800	16,600	48	50	47	100	21
Green	10,650	2,800	26	21	43	63	27
Greenup	3,600	0	0	0	0	0	0
Hancock	22,629	9,714	43	50	30	100	20
Hardin	72,300	39,300	54	53	50	88	35
Harlan	550	0	0	0	0	0	0
Harrison	15,000	6,500	43	57	75	100	0
Hart	6,140	3,005	49	51	0	100	50
Henderson	166,000	75,000	45	41	43	89	50
Henry	21,200	6,250	29	36	0	100	10
Hickman	100,900	73,180	73	80	90	99	20
Hopkins	65,500	32,425	50	40	60	94	14
Jackson	3,000	350	12	12	0	0	0
Jefferson	4,735	2,255	48	41	57	80	30
Jessamine	2,300	950	41	33	50	100	50
Johnson	620	0	0	0	0	0	0
Kenton	735	205	28	25	40	75	0
Knott	625	0	0	0	0	0	0
Knox	4,800	1,700	35	33	44	50	67
Larue	32,500	23,300	72	77	83	92	33
Laurel	5,325	2,605	49	60	73	100	0
Lawrence	945	65	7	7	0	0	0
Lee	825	40	5	5	0	0	0
Leslie	250	0	0	0	0	0	0
Letcher	100	0	0	0	0	0	0
Lewis	13,750	1,950	14	20	70	100	0
Lincoln	13,500	4,750	35	40	25	50	0
Livingston	19,230	5,100	27	19	19	69	35
Logan	167,000	107,150	64	75	50	98	20
Lyon	10,350	7,250	70	60	80	92	67
McCracken	38,200	16,200	42	51	31	100	0
McCreary	433	0	0	0	0	0	0
McLean	100,000	29,150	29	36	19	90	3
Madison	11,220	2,000	18	35	0	0	0
Magoffin	2,000	0	0	0	0	0	0
Marion	35,290	16,045	45	42	50	50	46
Marshall	32,500	10,500	32	50	0	100	0
Martin	75	0	0	0	0	0	0
Mason	14,000	9,250	66	70	77	100	56
Meade	22,828	14,053	62	76	31	98	23

Table 1. Continued.

	Acreage of corn, soybeans and small grains			*% No-Till Planted*			
					Soybeans		
	Total Acres	*NT Acres*	*% NT*	*Corn*	*Full Season*	*Double Crop*	*Small Grains*
Menifee	850	100	12	12	0	0	0
Mercer	17,800	12,700	71	70	80	100	69
Metcalfe	14,700	3,550	24	23	33	33	20
Monroe	18,100	5,300	29	27	14	50	33
Montgomery	7,895	1,185	15	23	15	0	0
Morgan	1,500	500	33	33	0	0	0
Muhlenberg	35,000	16,000	46	44	47	75	25
Nelson	15,500	10,600	68	66	50	100	80
Nicholas	2,650	350	13	23	0	0	0
Ohio	58,950	11,500	20	24	13	71	16
Oldham	10,175	6,350	62	55	67	70	70
Owen	1,452	612	42	56	0	72	17
Owsley	1,480	0	0	0	0	0	0
Pendleton	6,750	1,850	27	50	50	57	0
Perry	75	0	0	0	0	0	0
Pike	205	0	0	0	0	0	0
Powell	1,647	0	0	0	0	0	0
Pulaski	24,000	11,800	49	43	67	85	42
Robertson	1,850	100	5	33	0	0	0
Rockcastle	4,550	1,450	32	28	60	67	42
Rowan	2,080	200	10	13	0	0	0
Russell	12,600	8,700	69	76	100	100	0
Scott	6,000	1,690	28	30	20	100	15
Shelby	45,900	25,550	56	72	40	88	30
Simpson	91,000	40,000	44	25	45	96	12
Spencer	11,300	4,600	41	42	30	83	40
Taylor	33,100	17,200	52	54	48	86	33
Todd	112,194	66,562	59	65	49	97	16
Trigg	31,784	22,034	69	74	63	100	39
Trimble	7,350	2,750	37	38	38	80	24
Union	124,500	63,000	51	46	51	100	57
Warren	71,800	39,500	55	45	50	97	33
Washington	13,800	8,100	59	69	43	57	53
Wayne	25,275	13,880	55	60	60	40	12
Webster	101,100	36,800	36	30	40	100	11
Whitley	3,450	525	15	21	0	0	0
Wolfe	1,981	80	4	8	0	0	0
Woodford	4,900	1,600	33	37	10	100	22
State Total	3,194,738	1,560,773	49	49	43	93	22

COOPERATIVE EXTENSION SERVICE
U.S. DEPARTMENT OF AGRICULTURE
UNIVERSITY OF KENTUCKY
COLLEGE OF AGRICULTURE
LEXINGTON, KENTUCKY 40546

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

AN EQUAL OPPORTUNITY EMPLOYER

BULK RATE
POSTAGE & FEES PAID
USDA
PERMIT No. G268

Table 2. Top Ten States in Percent of Grain Crops No-Tilled in 1994.

Rank	*State*	*% NT*
1	Kentucky	44.32
2	Tennessee	42.13
3	Maryland	41.35
4	Delaware	37.24
5	West Virginia	36.75
6	Ohio	35.37
7	Indiana	34.83
8	Virginia	34.17
9	Missouri	26.58
10	Michigan	23.08