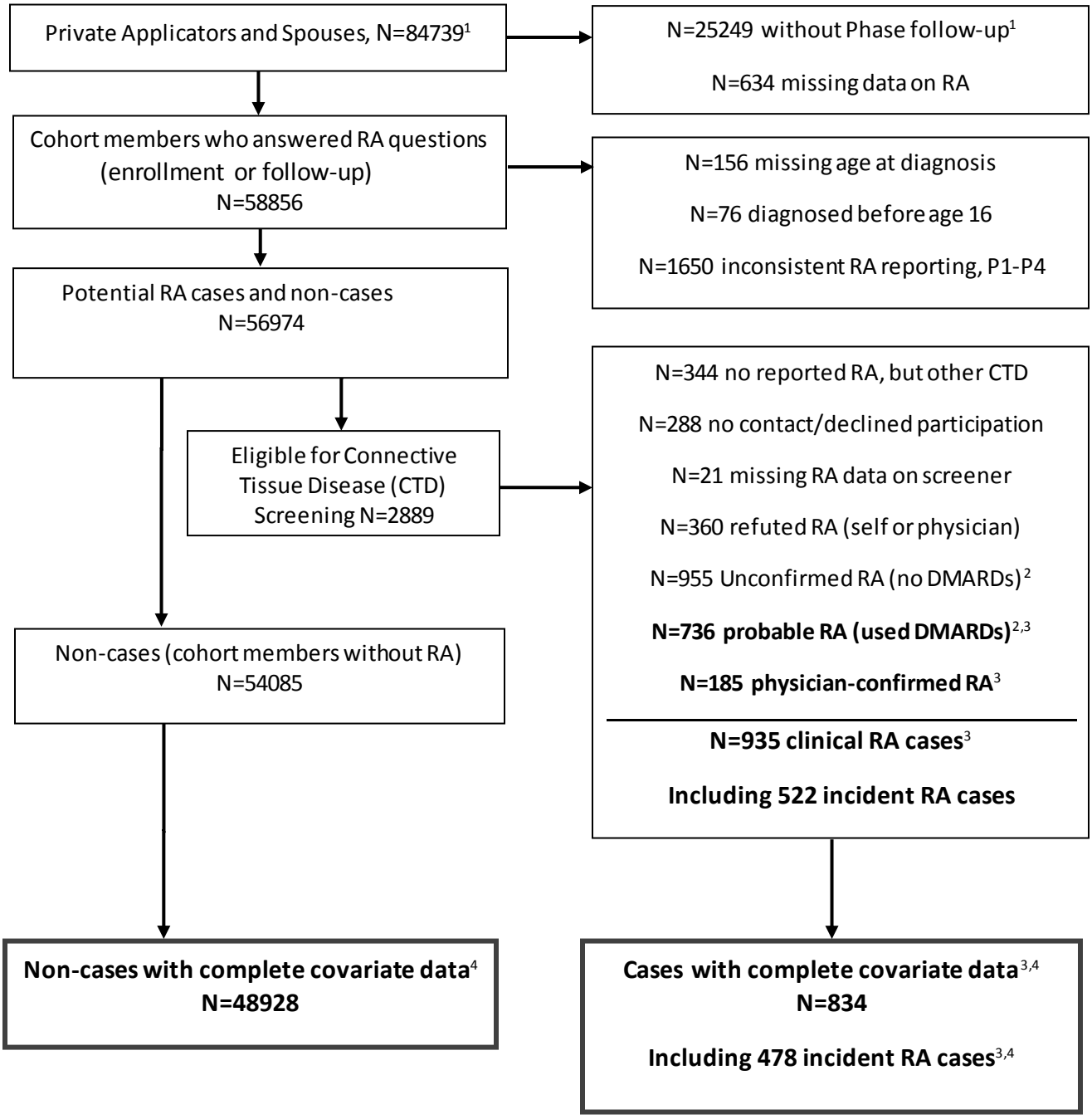


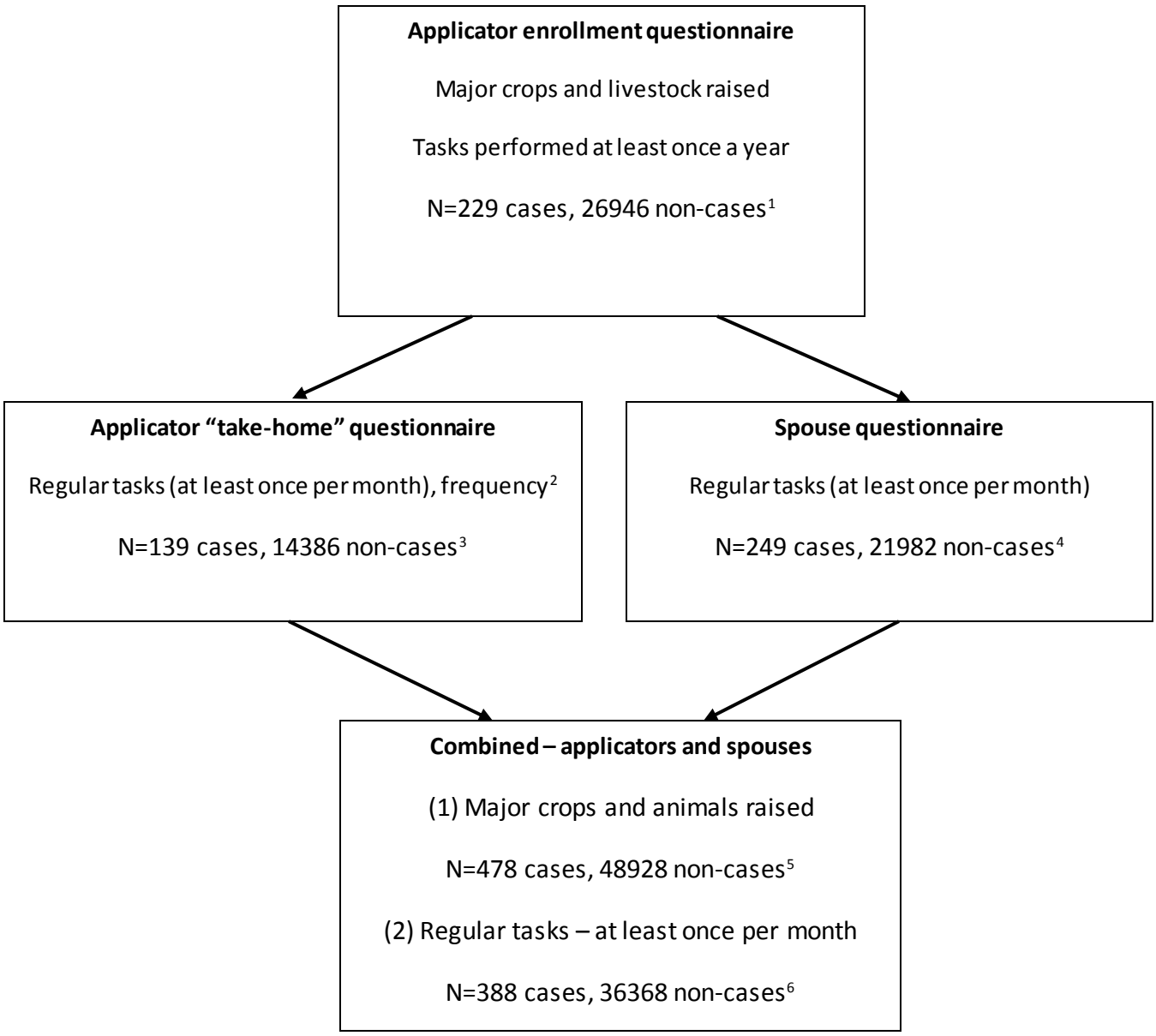
Supplemental Figure 1. Identification of incident RA cases and non-cases

[1]Questions on prevalent RA were asked of all spouses and 44% of enrolled applicators who completed a take-home questionnaire at Phase 1 (1993-1997). Of those, RA was reported by 5%; among those missing phase follow-up data, 6% reported RA.

[2]Disease modifying anti-rheumatic drugs (DMARDs)

[3]Incident RA cases were identified during follow-up surveys in 1999-2003 (Phase 2), 2005 to 2010 (Phase 3), and 2013 to 2015 (Phase 4). Only spouses were asked about RA and related connective tissue diseases (CTD) in Phase 2, while all participants were asked in Phases 3 and 4. Of the total of 935 clinical RA cases were identified by CTD screening, 736 were confirmed as probable cases based on reported DMARD use, and 185 were confirmed by physician report or medical records review. Of these, 478 were incident and had complete data on baseline covariates: 125 (26%) were incident by Phase 2, 160 (33%) by Phase 3, and 190 (40%) by Phase 4, while 3 were incident compared to enrollment, but the relative timing of diagnosis could not be determined.

[4]Base model covariates, including age, state, packyears, education



Supplemental Figure 2. Data elements and sample for applicators, spouses, and combined analysis

[1]Complete data on pesticides covariates and diagnosis age on enrolled applicators available for 196 cases and 24357 non-cases.

[2]Frequency in the last growing season of field work (e.g. planting, driving combines or mechanical harvesters: never, 1-10 days, 11-30 days, 31-100 days, >100 days; applying natural fertilizer or chemical fertilizer, handpicking crops: never, 1-5 days, 6-25 days, 26-50 days, and

more than 50 days), and other tasks (e.g., grinding feed and repairing engines), in the summer and in the winter, and how often (i.e., never or less than once per month, monthly, weekly (1-5 times per week), or daily (6-7 days per week). Analysis variables were based on the highest frequency level reported in either season.

[3]Complete data on pesticides covariates and diagnosis age on applicators from the "take-home" questionnaire available for 120 cases and 13436 non-cases.

[4]Complete data on pesticides covariates and diagnosis age on enrolled spouses available for 231 cases and 20842 non-cases.

[5]Complete data on pesticides covariates and diagnosis age available for the combined sample of 427 cases and 45199 non-cases, including all enrolled applicators (196 cases and 24357 non-cases) and spouses (231 cases and 20842 non-cases).

[6]Complete data on pesticides covariates and diagnosis age on the combined sample of applicators who completed the "take home" questionnaire (120 cases and 13436 non-cases) and all spouses (231 cases and 20842 non-cases).

Supplemental Table 1. Incident RA in relation to crops and livestock at enrollment, stratified by applicator and spouse status[1]

	Applicator		Spouse	
	RA Cases		RA Cases	
	N=196		N=231	
Raised for income	N (%)	HR[2] (95%CI)	N (%)	HR[2] (95%CI)
Crops only, ≤62	69 (35)	Referent	59 (26)	Referent
>62			29 (13)	Referent
Animals only, ≤62	2 (1)	NA	2 (1)	NA
>62			3 (1)	NA
Both, ≤62	108 (55)	0.91 (0.66 to 1.26)	84 (36)	0.66 (0.46 to 0.95)
>62			36 (16)	0.89 (0.54 to 1.48)
Neither, ≤62	17 (9)	1.35 (0.78 to 2.33)	11 (7)	0.86 (0.44 to 1.66)
>62			7 (9)	1.06 (0.25 to 4.46)
Crops[3]				
Alfalfa	48 (24)	1.25 (0.88 to 1.81)	57 (25)	1.27 (0.91 to 1.77)
Field corn, ≤62	145 (74)	1.06 (0.70 to 1.61)	113 (72)	0.86 (0.54 to 1.37)
>62			57 (77)	2.16 (1.15 to 4.08)
Hay, ≤62	29 (15)	0.64 (0.42 to 0.98)	69 (30)	0.89 (0.67 to 1.20)
>62	30 (15)	1.50 (0.92 to 2.43)		
Oats	48 (24)	1.18 (0.83 to 1.66)	48 (21)	0.96 (0.68 to 1.35)
Soybeans, ≤62	134 (68)	0.91 (0.63 to 1.32)	104 (66)	0.84 (0.57 to 1.25)
>62			51 (69)	1.56 (0.88 to 2.78)
Sweet corn	24 (12)	1.49 (0.95 to 2.28)	21 (9)	1.05 (0.66 to 1.69)
Wheat	19 (10)	0.59 (0.34 to 0.99)	31 (13)	1.25 (0.83 to 1.91)
Livestock[2]				
Beef cattle	65 (33)	0.80 (0.59 to 1.09)	78 (34)	0.80 (0.60 to 1.07)
Hogs	59 (30)	0.92 (0.65 to 1.29)	69 (30)	0.91 (0.67 to 1.25)

[1]Numbers shown are for those with complete data on pesticide covariates and diagnosis age for enrolled applicators (196 cases and 24357 non-cases) and spouses (231 cases and 20842 non-cases)

[2]Hazard ratios (HR) and 95% confidence intervals (CI) estimated by cox proportional hazards model adjusting for state, participant type (applicator/spouse), smoking pack-years, education, and pesticides; not applicable (NA) for less than 5 exposed cases. Hazard ratios allowed to vary by the median age (i.e., 62 years) when proportional hazards assumption was not met ($p \leq 0.10$).

[3]Common crops or livestock (with 10% cases exposed).

Supplemental Table 2. Incident RA in relation to crops and livestock at enrollment, stratified by state[1]

	Iowa		NC	
	RA Cases		RA Cases	
	N=251		N=176	
Raised for income	N (%)	HR[2] (95%CI)	N (%)	HR[2] (95%CI)
Crops only	69 (27)	Reference	88 (50)	Reference
Animals only	4 (2)	NA	3 (2)	NA
Both	173 (68)	0.84 (0.63 to 1.12)	55 (31)	0.81 (0.57 to 1.15)
Neither	5 (2)	0.94 (0.38 to 2.34)	30 (17)	1.04 (0.68 to 1.59)
Crops[3]				
Alfalfa	100 (40)	1.34 (1.00 to 1.69)	5 (3)	0.87 (0.36 to 2.12)
Field corn	238 (94)	1.04 (0.59 to 1.82)	77 (44)	1.16 (0.84 to 1.61)
Hay, ≤62	55 (22)	0.77 (0.55 to 1.08)	35 (20)	0.82 (0.56 to 1.20)
>62	38 (15)	1.38 (0.88 to 2.14)		
Oats	89 (35)	1.24 (0.95 to 1.62)	7 (4)	0.44 (0.31 to 0.94)
Peanuts	0 (0)	NA	20 (11)	0.97 (0.58 to 1.60)
Soybeans	216 (86)	0.96 (0.67 to 1.39)	73 (42)	0.98 (0.71 to 1.37)
Sweet corn	24 (9)	1.45 (0.94 to 2.22)	21 (12)	1.05 (0.66 to 1.70)
Tobacco	0 (0)	NA	62 (35)	0.77 (0.57 to 1.07)
Wheat	5 (2)	0.85 (0.35 to 2.08)	45 (26)	0.89 (0.62 to 1.28)
Livestock[2]				
Beef cattle	101 (40)	0.76 (0.59 to 0.99)	52 (25)	0.85 (0.60 to 1.21)
Hogs, ≤62	86 (34)	0.86 (0.63 to 1.17)	10 (6)	0.58 (0.29 to 1.13)
>62	32 (13)	1.10 (0.70 to 1.73)		

[1]Numbers shown are for those with complete data on pesticide covariates and diagnosis age for all enrolled applicators and spouses, including 251 cases and 32047 non-cases from IA, and 176 cases and 13152 non-cases from NC.

[2]Hazard ratios (HR) and 95% confidence intervals (CI) estimated by cox proportional hazards model adjusting for state, participant type (applicator/spouse), smoking pack-years, education, and pesticides; not applicable (NA) for less than 5 exposed cases. Hazard ratios allowed to vary by the median age (i.e., 62 years) when proportional hazards assumption was not met ($p \leq 0.10$).

[3]Common crops or livestock (with 10% cases exposed).

Supplemental Table 3. Incident RA and farm tasks reported by applicators at enrollment, by state[1]

	Iowa		North Carolina	
Tasks (at least once per year)	RA cases N=113		RA cases N=83	
	N (%)	HR (95%CI)[2]	N (%)	HR (95%CI)[2]
Veterinary services	72 (64)	0.78 (0.52 to 1.16)	25 (30)	0.89 (0.54 to 1.44)
Butcher animals	15 (13)	1.04 (0.59 to 1.82)	14 (17)	0.92 (0.51 to 1.68)
Work in swine areas	45 (40)	1.06 (0.69 to 1.50)	7 (8)	0.87 (0.37 to 2.03)
Work in poultry areas	2 (2)	NA	3 (4)	NA
Load/unload silage	36 (32)	1.09 (0.72 to 1.64)	7 (8)	1.29 (0.58 to 2.85)
Grind animal feed	77 (68)	1.26 (0.84 to 1.90)	15 (18)	0.82 (0.45 to 1.47)
Handle stored grain	102 (90)	0.96 (0.51 to 1.81)	31 (37)	0.91 (0.56 to 1.48)
Handle stored hay	75 (66)	0.94 (0.63 to 1.40)	33 (40)	0.86 (0.55 to 1.35)
Repair engines	55 (49)	1.17 (0.78 to 1.71)	37 (45)	1.00 (0.64 to 1.56)
Replace asbestos brakes	18 (16)	1.12 (0.67 to 1.70)	22 (26)	1.34 (0.81 to 2.19)
Weld, ≤62	57 (50)	0.60 (0.33 to 1.06)	42 (51)	0.87 (0.55 to 1.37)
>62	36 (32)	2.23 (0.86 to 5.78)		
Paint, ≤62	58 (51)	0.91 (0.51 to 1.65)	45 (54)	0.89 (0.55 to 1.37)
>62	33 (29)	1.72 (0.76 to 3.91)		
Repair pesticide equipment	82 (73)	1.10 (0.72 to 1.69)	49 (59)	0.79 (0.49 to 1.29)

[1] Numbers shown are for those with complete data on pesticide covariates and diagnosis age for applicators who completed the enrollment questionnaire, including 113 cases and 17438 non-cases from IA and 83 cases and 6919 non-cases from NC.

[2]Hazard ratios (HR) and 95% confidence intervals (CI) estimated by cox proportional hazards model adjusting for state, participant type (applicator/spouse), smoking pack-years, education, and pesticides;

not applicable (NA) for less than 5 exposed cases. Hazard ratios allowed to vary by the median age (i.e., 62 years) when proportional hazards assumption was not met ($p \leq 0.10$).

Supplemental Table 4. Incident RA in relation to the frequency of field work and other farm tasks performed regularly by applicators[1]

	RA cases N=120 N (%)	Overall HR (95% CI)[2]	p-value
Regular field work			
Till the soil (plow, disc, cultivate)			
Never	6 (5)	.	.
1-10 days	31 (27)	1.36 (0.56 to 3.27)	0.50
11-30 days	48 (41)	1.32 (0.55 to 3.17)	0.53
31-100 days	27 (23)	1.24 (0.50 to 3.07)	0.64
More than 100 days	5 (4)	1.42 (0.43 to 4.77)	0.57
P-trend		0.86	
Planting			
Never	7 (6)	.	.
1-10 days	32 (27)	1.36 (0.60 to 3.09)	0.46
11-30 days	68 (58)	1.30 (0.59 to 2.86)	0.52
More than 30 days	10 (9)	1.24 (0.46 to 3.30)	0.67
P-trend		0.82	
Apply natural fertilizer (manure)			
Never	45 (39)	.	.
1-5 days	30 (26)	1.13 (0.70 to 1.81)	0.63
6-25 days	23 (20)	0.95 (0.55 to 1.63)	0.85
26-50 days	9 (8)	1.06 (0.48 to 2.34)	0.89
More than 50 days	8 (7)	1.64 (0.74 to 3.66)	0.23
P-trend		0.50	
Apply chemical fertilizer			
Never	17 (15)	.	.
1-5 days	50 (43)	1.16 (0.66 to 2.05)	0.60
6-25 days	43 (37)	1.34 (0.75 to 2.41)	0.33
More than 25 days	7 (6)	1.59 (0.64 to 3.96)	0.32
P-trend		0.25	
Handpick crops			
Never	70 (60)	.	.
1-5 days	29 (25)	1.30 (0.82 to 2.06)	0.26
6-25 days	13 (11)	1.36 (0.70 to 2.62)	0.36
More than 25 days	4 (3)	NA	0.31
P-trend		0.96	
Other regular tasks			
Drive trucks			
Never or less than once a month	33 (28)	.	.
Monthly	20 (17)	1.03 (0.59 to 1.82)	0.91

	Weekly	63 (54)	1.02 (0.65 to 1.61)	0.93
	P-trend		0.91	
Drive a diesel tractor				
Never or less than once a month		10 (8)	.	.
	Monthly	5 (4)	0.57 (0.19 to 1.67)	0.30
	Weekly	103 (87)	1.14 (0.57 to 2.30)	0.71
	P-trend		0.91	
Drive a gas tractor				
Never or less than once a month		42 (36)	.	.
	Monthly	30 (26)	0.86 (0.53 to 1.40)	0.55
	Weekly	45 (38)	0.74 (0.47 to 1.14)	0.17
	P-trend		0.17	
Welding				
Never or less than once a month		37 (32)	.	.
	Monthly	52 (44)	1.33 (0.84 to 2.09)	0.22
	Weekly	28 (24)	1.52 (0.90 to 2.57)	0.12
	P-trend		0.13	
Repair engines				
Never or less than once a month		61 (52)	.	.
	Monthly	47 (40)	1.29 (0.87 to 1.90)	0.21
	Weekly	9 (8)	1.33 (0.66 to 2.70)	0.43
	P-trend		0.20	
Grind metal				
Never or less than once a month		35 (30)	.	.
	Monthly	56 (48)	1.12 (0.72 to 1.75)	0.61
	Weekly	25 (22)	1.09 (0.64 to 1.89)	0.75
	P-trend			0.71
Use gasoline to clean				
Never or less than once a month		70 (60)	.	.
	Monthly	39 (33)	1.04 (0.69 to 1.55)	0.87
	Weekly	8 (7)	0.99 (0.45 to 2.15)	0.97
	P-trend		0.93	
Use other solvents to clean				
Never or less than once a month		83 (71)	.	.
	Monthly	27 (23)	1.17 (0.75 to 1.82)	0.48
	Weekly	7 (6)	1.83 (0.84 to 3.98)	0.13
	P-trend		0.15	
Painting				
Never or less than once a month		72 (61)	.	.
	Monthly	40 (34)	0.89 (0.60 to 1.33)	0.58
	Weekly	6 (5)	2.55 (1.10 to 5.89)	0.029
	P-trend		0.58	

[1]Resuls shown are for those with complete data on pesticides covariates and diagnosis age for applicators who completed the "take-home" questionnaire, including 120 cases and 13436 non-cases; Numbers may not add to total due to missing values on individual exposures.

[2]Hazard model adjusted for participant type (applicator/spouse), smoking pack-years, education, and pesticides; not applicable (NA) for less than 5 exposed cases. Proportional hazards assumption was not met ($p \leq 0.10$) for driving combines or mechanical harvesters, performing veterinary procedures, and grinding feed (see Supplemental Table 5).

Supplemental Table 5. Proportional hazards for selected field work and other farm tasks in applicators, stratified by median age

	Under age 62 years			Over age 62 years		
	RA cases N=65 N (%)	HR (95% CI)	p-value	RA cases N=55 N (%)	HR (95% CI)	p-value
Field tasks (days per year)						
Drive a combine or harvest by machine						
Never	17 (27)	Referent		8 (16)	Referent	
1-5 days	16 (25)	0.87 (0.41 to 1.84)	0.72	10 (20)	2.15 (0.82 to 5.68)	0.12
6-25 days	20 (31)	0.48 (0.22 to 1.03)	0.059	21 (41)	2.54 (0.99 to 6.55)	0.054
More than 25 days	11 (17)	0.45 (0.19 to 1.09)	0.078	12 (24)	3.03 (1.09 to 8.45)	0.034
P-trend		0.028			0.037	
Other regular tasks						
Perform veterinary procedures						
Never or less than once a month	42 (66)	Referent		33 (62)	Referent	
Monthly	13 (20)	0.59 (0.30 to 1.16)	0.13	14 (26)	1.33 (0.67 to 2.62)	0.42
Weekly	9 (14)	0.98 (0.46 to 2.09)	0.96	6 (11)	2.25 (0.90 to 5.63)	0.084
P-trend		0.55			0.092	
Grind animal feed						
Never or less than once a month	38 (59)	Referent		30 (57)	Referent	
Monthly	4 (6)	0.61 (0.21 to 1.73)	0.35	8 (15)	1.93 (0.86 to 4.39)	0.11
Weekly	22 (34)	1.19 (0.63 to 2.22)	0.59	25 (28)	1.86 (0.87 to 3.97)	0.11
P-trend		0.66			0.082	

[1]Results shown are for those with complete data on pesticides covariates and diagnosis age for applicators who completed the "take-home" questionnaire, including those 62 and younger (65 cases and 6129 non-cases) and over the age of 62 (55 cases and 7325 non-cases). Numbers may not add to total due to missing responses for individual exposures.

[2]Hazard model adjusted for participant type (applicator/spouse), smoking pack-years, education, and pesticides.

[2]Proportional hazards assumption was not met ($p \leq 0.10$)

Supplemental Table 6. Incident RA in relation to regular field work and other farm tasks in spouses

	Spouses[1]		
	RA Cases N=231 N (%)	HR (95% CI)[2]	P-value
Regular field work			
Till soil (cultivate, disc, plow)	52 (23)	0.93 (0.66 to 1.29)	0.65
Plant	73 (32)	1.30 (0.96 to 1.76)	0.09
Use natural fertilizer (manure)	35 (15)	1.14 (0.78 to 1.68)	0.49
Use chemical fertilizer	45 (20)	1.67 (1.17 to 2.38)	0.005
Drive combines	26 (11)	1.07 (0.69 to 1.66)	0.76
Handpick crops	68 (30)	1.11 (0.82 to 1.51)	0.49
Other regular tasks			
Milk cows	5 (2)	0.76 (0.31 to 1.87)	0.56
Vet procedures	24 (11)	0.91 (0.58 to 1.42)	0.65
Grind feed	14 (6)	1.11 (0.63 to 1.96)	0.72
Drive trucks	75 (36)	0.86 (0.64 to 1.15)	0.30
Diesel tractor	69 (32)	0.88 (0.64 to 1.20)	0.41
Gasoline tractor	60 (27)	1.00 (0.73 to 1.37)	0.99
Welding	3 (1)	NA	---
Repairing engines	3 (1)	NA	---
Grind metal	6 (3)	1.78 (0.73 to 4.32)	0.20
Use gasoline to clean	36 (17)	1.06 (0.72 to 1.56)	0.77
Use other solvents to clean	57 (27)	1.46 (1.06 to 2.01)	0.022
Painting	86 (39)	1.42 (1.07 to 1.89)	0.017

[1]Results shown for those with complete data on pesticides covariates and diagnosis age for enrolled spouses available for 231 cases and 20842 non-cases.

[2]Hazard ratios (HR) and 95% confidence intervals (CI) estimated by cox proportional hazards model adjusting for state, participant type (applicator/spouse), smoking pack-years, education, and pesticides; not applicable (NA) for less than 5 exposed cases. Hazard ratios allowed to vary by the median age (i.e., 62 years) when proportional hazards assumption was not met ($p \leq 0.10$).

Supplemental Table 7. Incident RA in relation to regular field work and other farm tasks in applicators and spouses, stratified by state[1]

	Iowa			North Carolina		
	RA Cases N=204			RA Cases N=147		
	N (%)	HR (95% CI)[2]	P-value	N (%)	HR (95% CI)[2]	P-value
Regular field work						
Till soil (cultivate, disc, plow)	100 (50)	0.86 (0.59 to 1.25)	0.44	63 (44)	1.22 (0.75 to 2.00)	0.43
Plant	86 (43)	1.16 (0.77 to 1.75)	0.49	97 (66)	1.43 (0.97 to 2.12)	0.073
Use natural fertilizer (manure)	66 (33)	1.17 (0.78 to 1.76)	0.45	10 (8)	1.04 (0.71 to 1.54)	0.83
Use chemical fertilizer	72 (36)	1.61 (1.02 to 2.53)	0.039	73 (50)	1.46 (0.97 to 2.21)	0.072
Drive combines, ≤62 years[4]	85 (43)	1.22 (0.80 to 1.85)	0.36	13 (9)	0.46 (0.21 to 1.03)	0.060
>62 years				18 (12)	1.71 (0.78 to 3.78)	0.18
Handpick crops	33 (16)	0.96 (0.65 to 1.40)	0.82	81 (56)	1.33 (0.94 to 1.87)	0.11
Other regular tasks						
Milk cows	10 (5)	1.07 (0.56 to 2.04)	0.83	2 (1)	NA	---
Vet procedures, ≤62 years[4]	52 (27)	0.93 (0.65 to 1.37)	0.69	5 (3)	0.53 (0.21 to 1.36)	0.19
>62 years				9 (6)	1.86 (0.84 to 4.16)	0.13
Grind feed, ≤62 years[4]	63 (19)	1.14 (0.82 to 1.59)	0.43	2 (1)	NA	--
>62 years				7 (5)	1.80 (0.72 to 4.50)	0.21
Drive trucks	80 (41)	0.85 (0.62 to 1.15)	0.29	78 (56)	1.00 (0.69 to 1.48)	0.98
Diesel tractor, ≤62 years[4]	116 (58)	0.89 (0.63 to 1.27)	0.54	31 (38)	0.55 (0.30 to 1.01)	0.055
>62 years				30 (53)	1.55 (0.77 to 3.12)	0.22
Gasoline tractor, ≤62 years[4]	68 (33)	1.40 (0.96 to 2.05)	0.079	19 (24)	0.63 (0.36 to 1.09)	0.097
>62 years	28 (14)	0.55 (0.31 to 0.97)	0.039	20 (35)	1.04 (0.56 to 1.94)	0.89
Welding	54 (27)	1.28 (0.73 to 2.24)	0.38	28 (20)	1.23 (0.71 to 2.11)	0.47
Repairing engines	36 (18)	1.28 (0.81 to 2.03)	0.29	23 (17)	1.07 (0.63 to 1.83)	0.79
Grind metal	58 (29)	1.49 (0.83 to 2.62)	0.18	29 (21)	0.93 (0.54 to 1.62)	0.89
Use gasoline to clean	58 (32)	0.98 (0.71 to 1.37)	0.92	25 (19)	1.18 (0.73 to 1.90)	0.50
Use other solvents to clean	62 (32)	1.31 (0.96 to 1.78)	0.088	29 (21)	1.47 (0.96 to 2.27)	0.078

	Painting	88 (44)	1.11 (0.83 to 1.48)	0.48	44 (32)	1.50 (1.03 to 2.18)	0.033

[1] Numbers shown are for those with complete data on pesticide covariates and diagnosis age for applicators with the take-home questionnaire and spouses, including 204 cases and 24444 non-cases from IA, and 147 cases and 9851 non-cases from NC.

[2]Hazard model adjusted for participant type (applicator/spouse), smoking pack-years, education, and pesticides; not pplicable (NA) for less than 5 exposed cases. Hazard ratios allowed to vary by the median age (i.e., 62 years) when proportional hazards assumption was not met ($p \leq 0.10$)

Supplemental Table 8. Incident RA in relation to combined tasks: planting and chemical fertilizers, solvents and painting

	Overall[1]			Applicators only		
	RA cases N=351 N (%)	HR (95% CI)[2]	p-value	RA cases N=120	HR (95% CI)[2]	p-value
Planting and chemical fertilizer use						
Neither	157 (45)	Referent		4 (3)	Referent	
Planting only	44 (13)	1.02 (0.72 to 1.45)	0.91	13 (11)	NA	---
Fertilizer only	8 (2)	1.36 (0.66 to 2.81)	0.41	3 (3)	NA	---
Both	137 (39)	1.53 (1.10 to 2.14)	0.013	97 (83)	NA	---
Painting and solvent use						
Neither	190 (57)	Referent		61 (52)		
Painting only	51 (15)	1.07 (0.77 to 1.47)	0.70	22 (19)	0.88 (0.53 to 1.46)	0.61
Solvents only	15 (4)	1.34 (0.78 to 2.33)	0.77	11 (9)	1.41 (0.74 to 2.69)	0.30
Both	76 (23)	1.44 (1.09 to 1.90)	0.009	23 (20)	1.13 (0.70 to 1.86)	0.59

[1]Results shown for combined sample of applicators who completed the "take home" questionnaire (120 cases and 13436 non-cases) and enrolled spouses (231 cases and 20842 non-cases). Numbers may not add to total due to missing responses for individual exposures.

[2]Hazard model adjusted for participant type (applicator/spouse), smoking pack-years, education, and pesticides; not applicable (NA) for less than 5 exposed cases. Hazard ratios allowed to vary by the median age (i.e., 62 years) when proportional hazards assumption was not met ($p \leq 0.10$)