Farm Consolidation and Its Drivers in the U.S.

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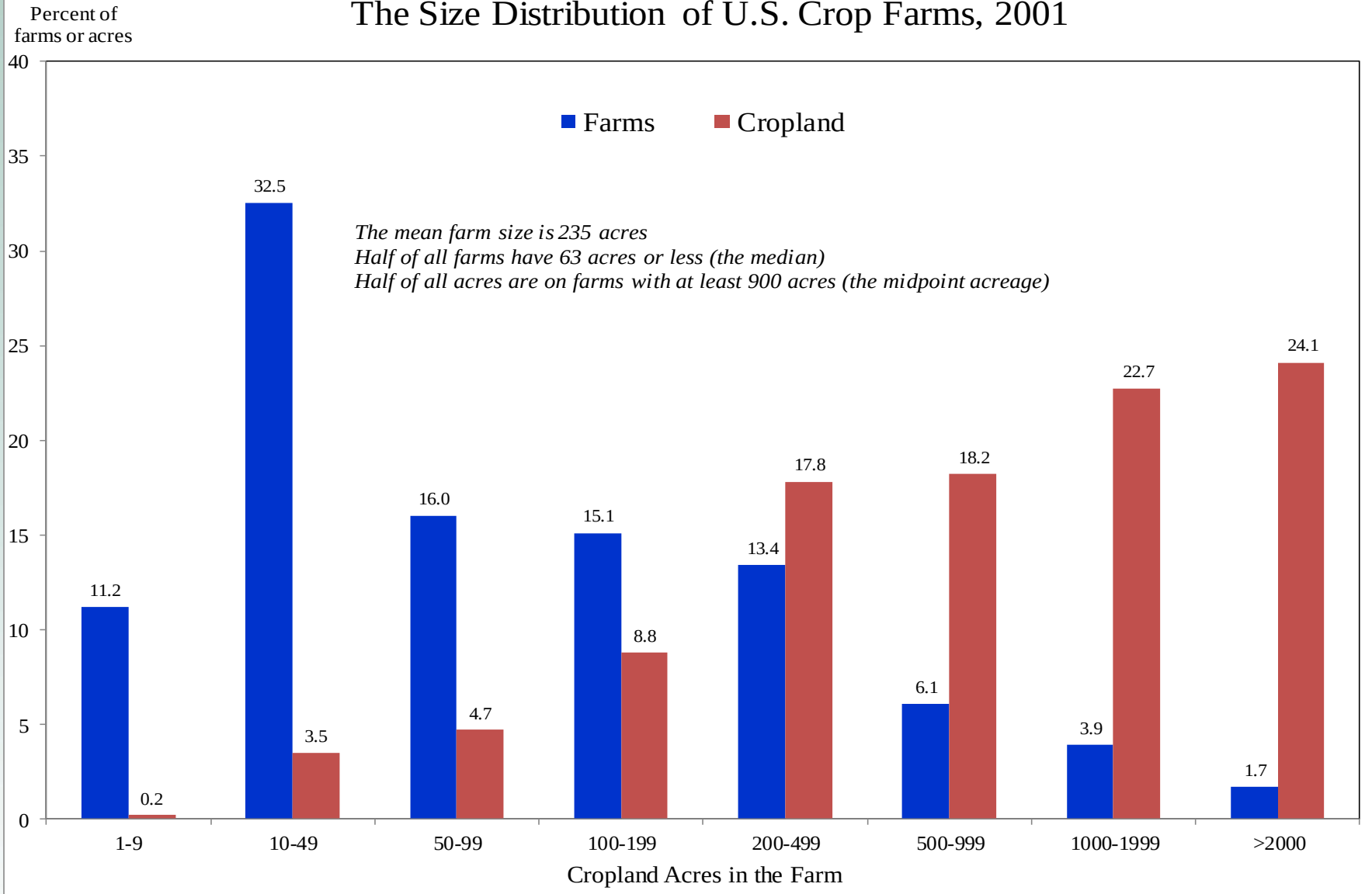
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Background…

- Measuring farm size and consolidation is challenging
  - Farm size distributions are complex
    - Such that hardly any farm is “average”
  - An alternative measure, used elsewhere, can be informative
  - Aim to incorporate into OECD comparisons
    - Cross-country comparisons, analysis, of concentration

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The Size Distribution of U.S. Crop Farms, 2001

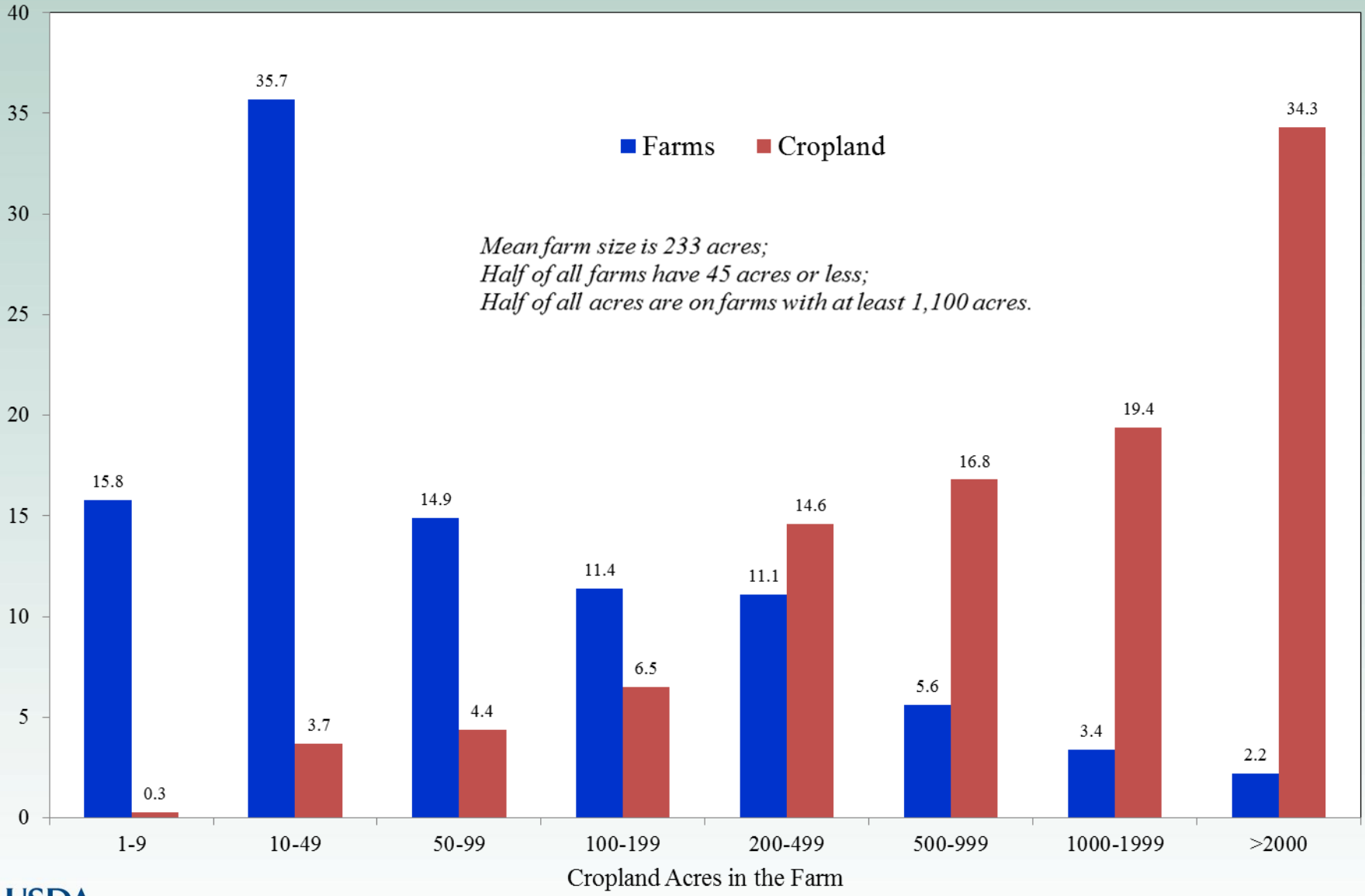


Source: NASS/ERS Agricultural Resource Management Survey, 2001

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The Size Distribution of U.S. Crop Farms, 2011



Source: 2011 USDA Agricultural Resource Management Survey

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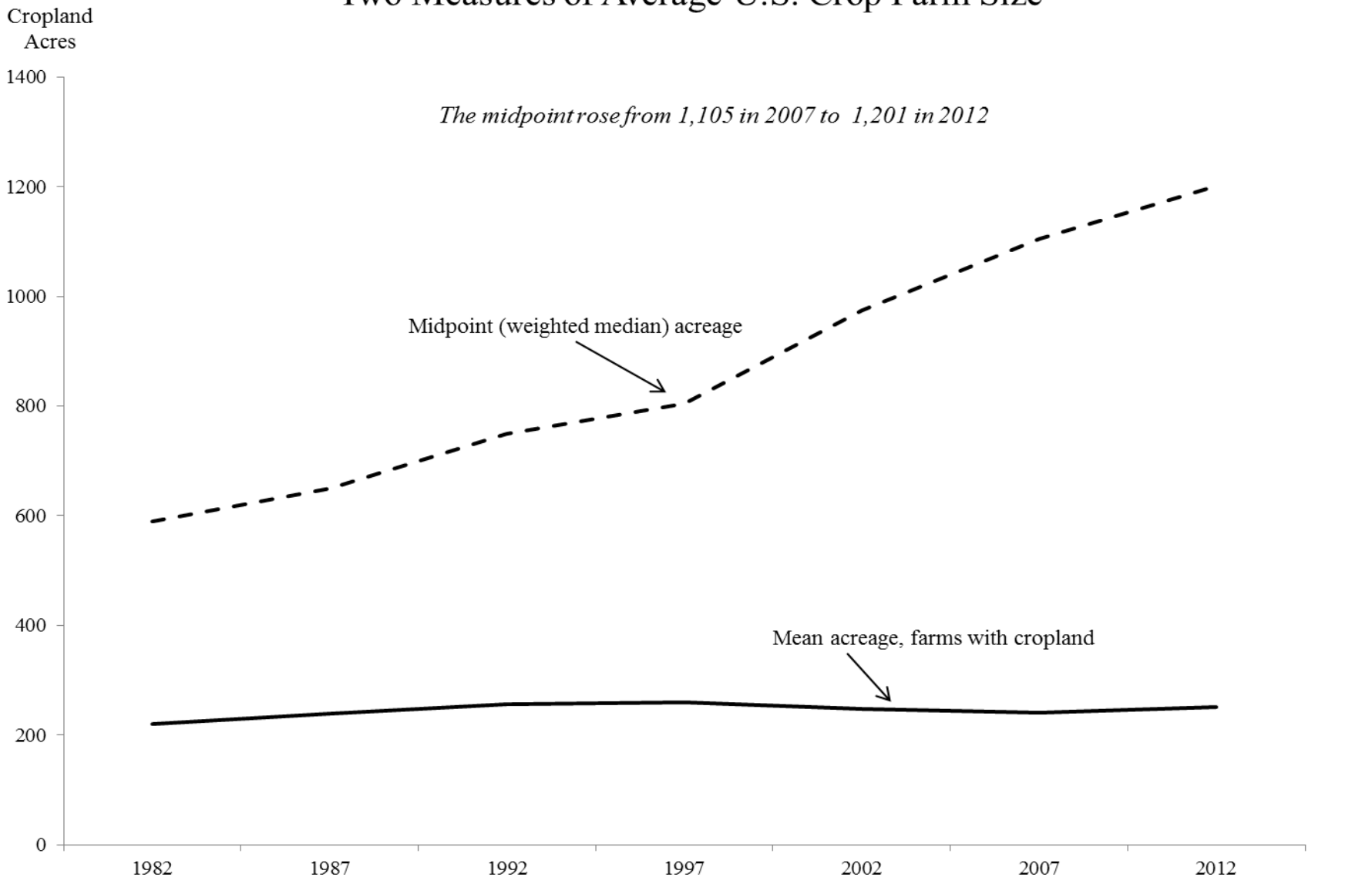
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The Midpoint Acreage

- Splits the distribution of acreage: half is on larger farms, and half is on smaller
  - Technically, it's the median of the distribution of acreage, by farm size (the median, weighted by acres)
- Used in describing plant & firm size distributions since the 1930's; U.K. and U.S. farms since 1980's.
  - An informative measure of central tendency in a skewed distribution.
  - Here, helps to track shifts of acreage, production, or livestock to larger farms

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Two Measures of Average U.S. Crop Farm Size

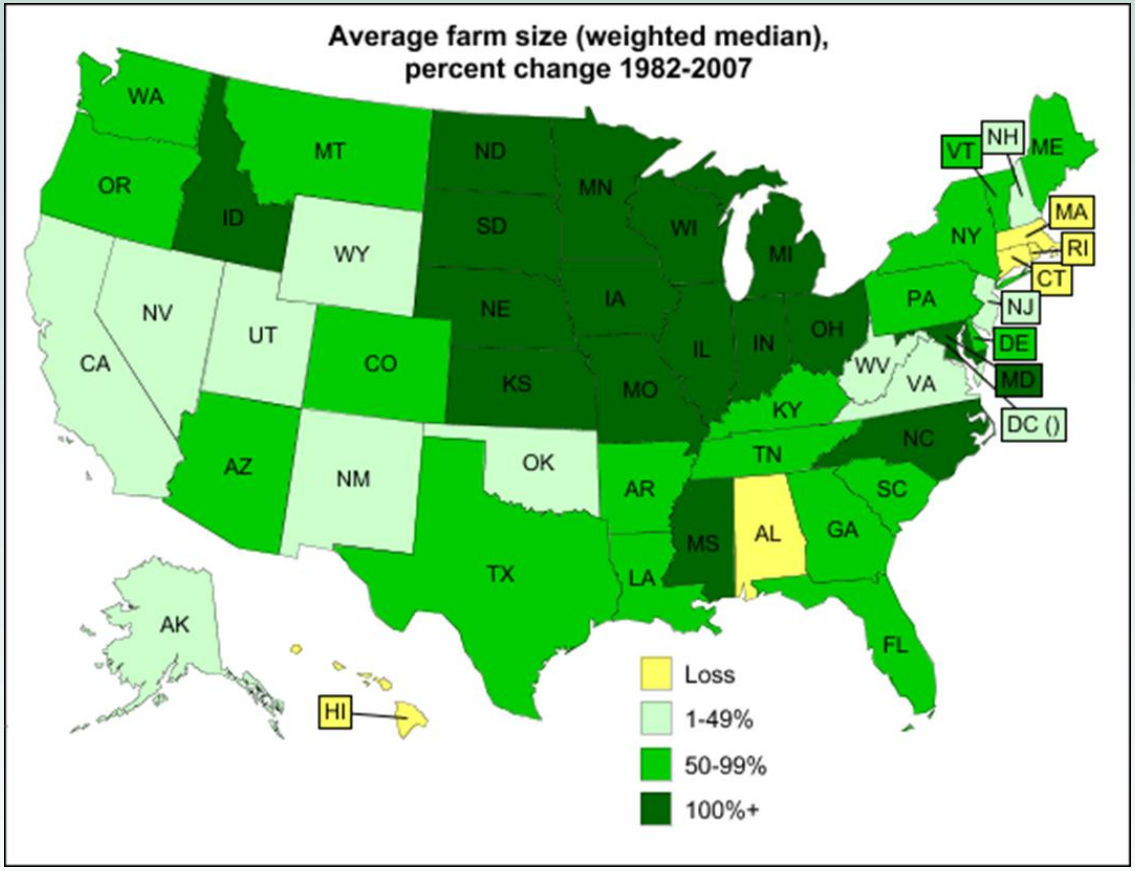


Source: USDA Census of Agriculture

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Cropland Consolidation Occurred Across the U.S.

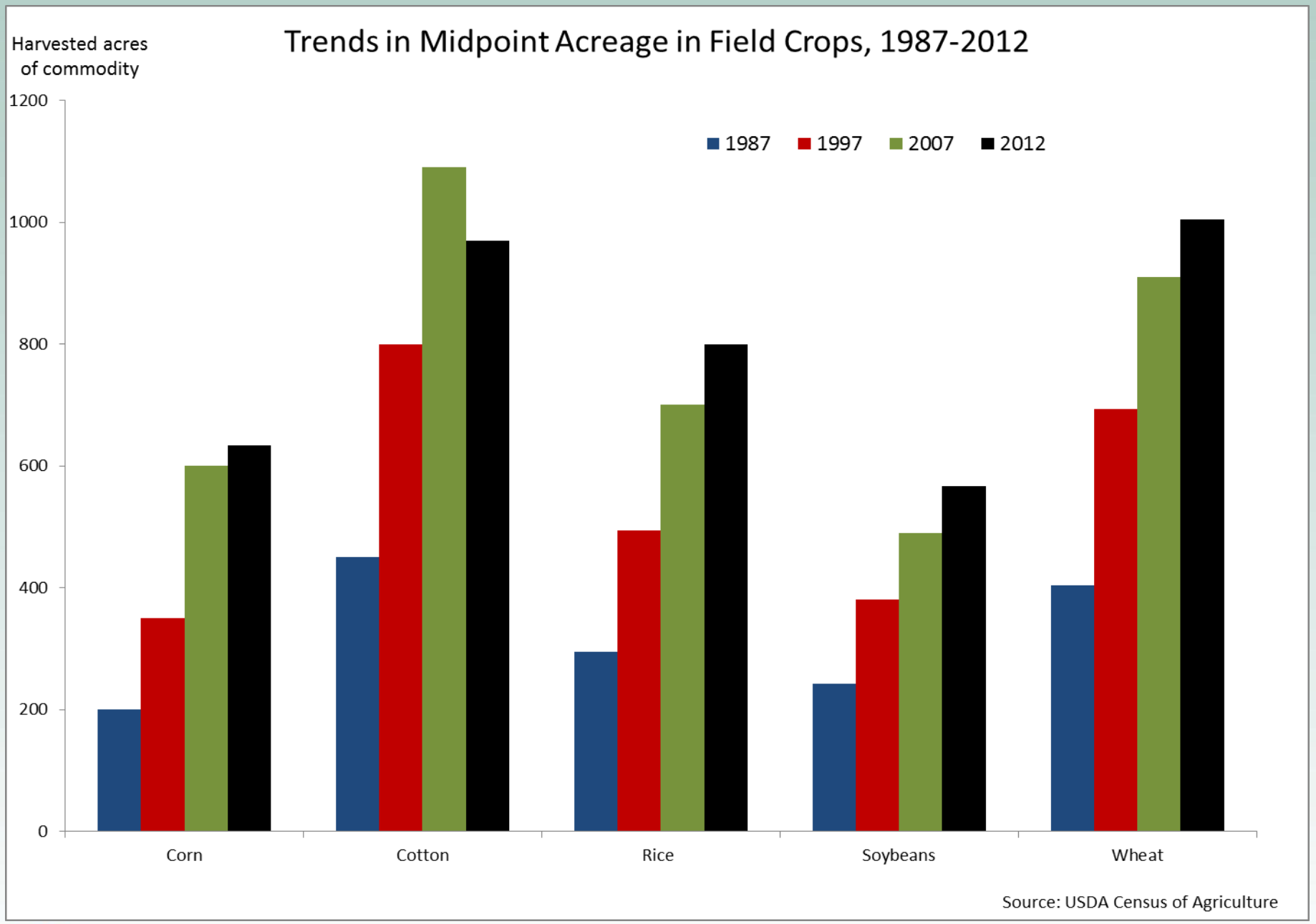
But was heaviest in the Corn Belt and Northern Plains



Source: USDA, Censuses of Agriculture, 1982-2007

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Trends in Midpoint Acreage in Field Crops, 1987-2012



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Not Just Field Crops

- 37 fruit, vegetable, nut, & berry crops
  - Covering over 90% of acreage
  - Midpoints increased for 36 of 37 over 1987-2012
  - Mean increase was 146%, median was 116%
  - 29 with increases in 2007-12; mean was 18%
  - Estimates in appendices

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We Also Applied the Measure to Livestock

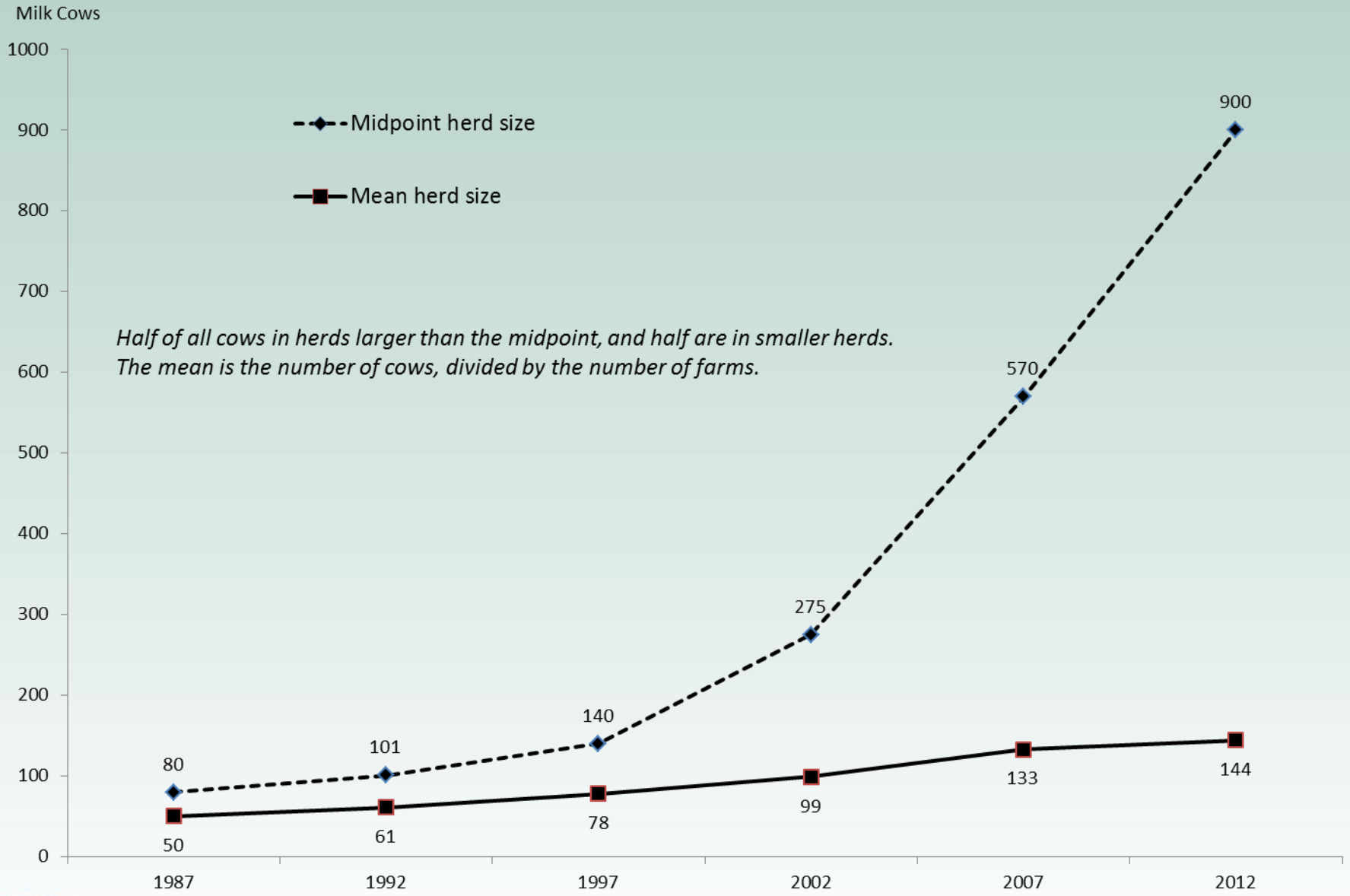
	Midpoint enterprise size			
Commodity	1987	1997	2007	2012
		Animals sold or removed		
Broilers	300,000	480,000	681,600	680,000
Hogs	1,200	11,000	30,000	40,000
Fattened Cattle	17,532	38,000	35,000	38,369
Cattle, <500 lbs.	50	65	128	200
		Milk cow inventory		
Dairy	80	140	570	900

Note: At the midpoint farm size, half of all head sold or in inventory are on larger farms, and half are on smaller farms.

Source: ERS calculations from unpublished Census of Agriculture records

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Dairy: Changes in Herd Size, 1987-2012



Source: USDA/NASS, census of agriculture records

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U.S. Farm Consolidation Is:

- Long-term and ongoing
- Ubiquitous, in almost all commodities
- Widespread, across States
  - With some important variation in rates
- Large

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Technology Must Play a Role

- For example,
  - Bigger and faster equipment
  - Pest management practices: chemical pesticides and herbicide tolerant seeds

- Each allows a farmer to manage more acres
  - Reduces labor time per acre
  - “Routinizes” production decisions

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Technology in a Picture: A Soybean Field in the Mississippi Delta



Large, fast, equipment

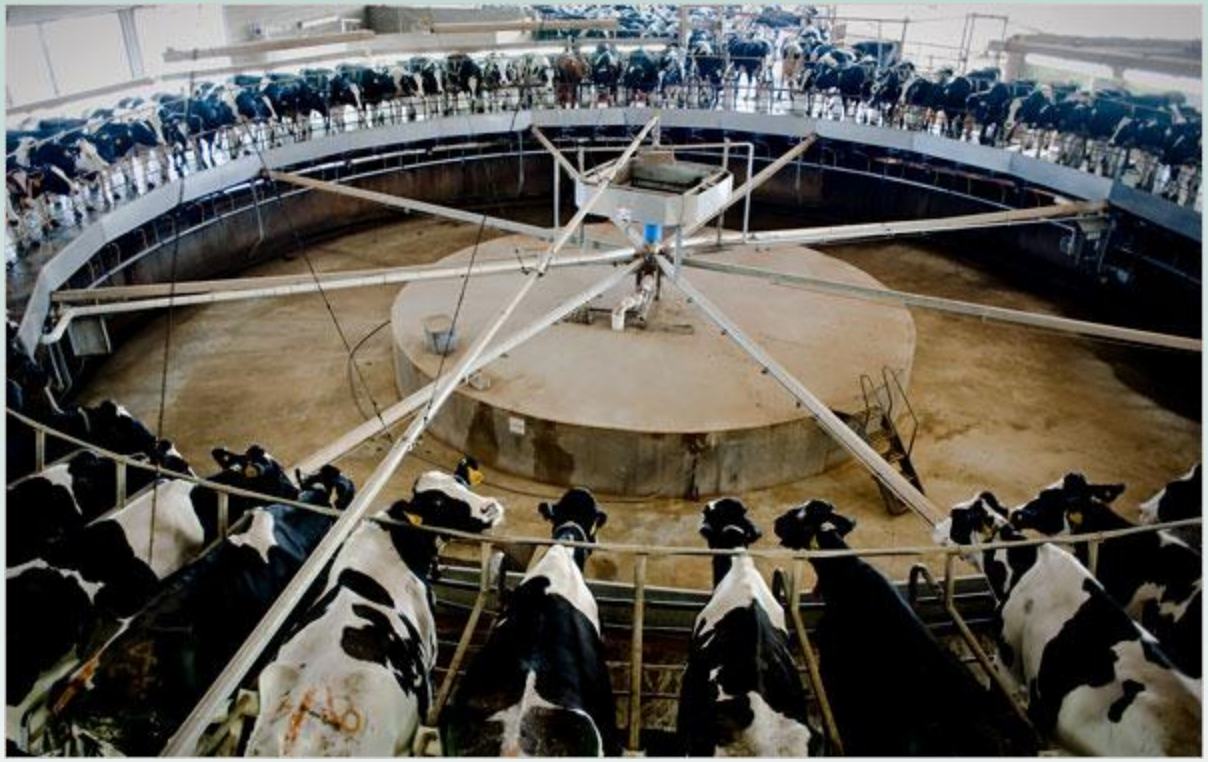
Flat & contiguous fields (technology, with constraints)

HT seeds

Variable rate spraying (add on guidance systems now)

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Another Example: A Dairy Farm in New York State



Rotary milker:
70 cow capacity;
3,000 cows/3 times a day

Add in automated feed & manure mgmt. systems, and IT, for scale technology

And then the specialization in complementary services that size allows

- Professional services
- Input purchase strategies
- Heifer raising
- Digesters

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Organizational Innovations Play a Role

- Specialization to tasks
  - Separation of hog production into stages
  - Specialization via production contracts
    - Hogs, fed cattle, fruits and vegetables
  - Specialization via hiring custom services
    - Field crops, dairy
  - Allows farmers to focus on some tasks, and to expand the operation in those tasks

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Policy: No Systematic Impact

- Specific policies can be shown to limit or encourage consolidation
- Widespread nature of consolidation suggests that policy cannot have been determinative
- Also, notice what *did not* happen: little policy reaction to dramatic change in dairy & hog industries
  - Farms: ↓ 68% (dairy) & 74% (hogs) in 25 years

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What Else Has Not Happened?

- Few truly corporatized farming businesses
  - Crop farms are getting larger, but none have more than 50,000 hectares of cropland
  - Livestock is more mixed
    - Some cattle feeders own multiple large feedlots
    - Some individuals own multiple large dairy farms
    - Integrators control vertical chains in hogs, poultry
      - But contract with independent growers

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Consolidation and Productivity

- Direct impacts:
  - Less labor (↑ Q/L)
  - Capital used more intensively (↑ Q/K)
  - Some savings in intermediate inputs
- Indirect
  - Via spread of innovations
  - Expansion of low-cost operations

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Summary

- Widespread, ongoing consolidation
  - Measurement matters
- Technology & innovation are important drivers
- Why is innovation labor-saving & scale-increasing?
  - Historic reason (nonfarm wages pulling labor from agriculture) is not as compelling now
- Two absences are notable:
  - Policy has not opposed consolidation
  - Consolidation has not been corporatized

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Thank you!

- Reference:
  - This presentation extends the ERS report *Farm Size and the Organization of U.S. Crop Farming*
    - http://www.ers.usda.gov/publications/err-economic-research-report/err152.aspx
    - http://www.ers.usda.gov/amber-waves/2013-september/cropland-consolidation-and-the-future-of-family-farms.aspx
- Contact
  - James MacDonald: macdonal@ers.usda.gov

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Appendix: Midpoints for vegetable & melon crops (harvested acreage)

Crop	1987	1997	2007	2012
Asparagus	160	200	240	200
Snap Beans	221	225	323	318
Broccoli	440	780	1000	1050
Cabbage	113	162	300	300
Cantaloupe	400	431	388	350
Carrots	350	900	600	1053
Cauliflower	240	400	400	425
Cucumber	115	250	505	450
Lettuce	949	1461	1815	1275
Onions, dry	115	220	320	348
Peas	100	125	179	198
Peppers, bell	88	180	300	210
Peppers, other		145	168	150
Potatoes	350	556	990	1054
Pumpkins	20	24	30	40
Spinach	162	242	423	687
Squash	35	60	72	75
Sweet Corn	100	173	250	300
Sweet Potatoes	140	250	474	560
Tomatoes	400	589	820	930
Watermelons	80	100	150	200

Source: ERS estimates from Census of Agriculture records

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Appendix: Midpoints for fruit and nut crops (harvested acreage)

Crop	1987	1997	2007	2012
Apples	83	122	146	179
Avocadoes	40	54	40	50
Sweet Cherries	32	40	65	80
Cherries, tart	65	89	150	175
Nectarines	70	120	186	239
Grapefruit	320	478	556	573
Almonds	203	292	450	547
Pecans	102	125	117	272
Pistachios	465	627	627	926
Walnuts	85	126	172	240
Blueberries	50	54	75	100
Cranberries	90	96	99	120
Strawberries	24	60	120	180
Grapes	205	306	320	420
Peaches	92	100	120	130
Pears	50	66	75	76
Oranges	450	769	1113	961

Source: ERS estimates from Census of Agriculture records

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