

 **2017-2024 Crop Year Survey Data Extrapolation**

| Corn & Soy Acres             | 2017       | 2018       | 2019       | 2020       | 2021       | 2022       | 2023       | 2024       | Average    |
|------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Corn acres (CDL)             | 13,212,913 | 13,012,207 | 13,648,497 | 13,793,805 | 12,826,886 | 12,686,886 | 12,805,034 | 13,133,558 | 13,139,973 |
| Soy acres (CDL)              | 9,782,215  | 9,956,734  | 9,275,193  | 9,553,928  | 10,150,325 | 10,046,351 | 9,850,104  | 10,128,623 | 9,842,934  |
| Corn & soy acres total (CDL) | 22,995,128 | 22,968,941 | 22,923,690 | 23,347,733 | 22,977,211 | 22,733,237 | 22,655,138 | 23,210,857 | 22,976,492 |

CDL = USDA Cropland Data Layer

| Commercial Only Nitrogen Rates (lb/ac)           | 2017  | 2018  | 2019  | 2020  | 2021  | 2022  | 2023  | 2024  | Average |
|--------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|---------|
| Average N rate on corn following soy in rotation | 170.0 | 172.3 | 177.5 | 183.4 | 170.9 | 173.4 | 166.6 | 179.2 | 174.2   |
| Average N rate on continuous corn                | 200.4 | 201.9 | 200.4 | 208.9 | 199.9 | 192.6 | 185.7 | 205.0 | 199.4   |

| Crop Rotation        | 2022  | 2023  | 2024  | Average |
|----------------------|-------|-------|-------|---------|
| Continuous Corn      | 10.6% | 12.7% | 11.6% | 11.6%   |
| Corn-Soy             | 85.3% | 84.6% | 81.7% | 83.9%   |
| Extended Rotation    | 2.0%  | 1.4%  | 3.3%  | 2.2%    |
| Corn-Small Grain-Soy | 0.2%  | 0.1%  | 0.3%  | 0.2%    |
| Other                | 1.9%  | 1.2%  | 3.1%  | 2.1%    |

|                       | Percentage |       |       |       |       |       |       |       |         |
|-----------------------|------------|-------|-------|-------|-------|-------|-------|-------|---------|
| Cover Crop Practices: | 2017       | 2018  | 2019  | 2020  | 2021  | 2022  | 2023  | 2024  | Average |
| Cover crop planted    | 6.9%       | 8.8%  | 9.5%  | 13.3% | 12.1% | 16.6% | 17.0% | 16.7% | 12.6%   |
| Rye cover crop        | 69.4%      | 82.8% | 81.3% | 90.9% | 80.8% | 81.8% | 86.6% | 89.6% | 82.9%   |
| Oat cover crop        | 9.1%       | 9.8%  | 2.8%  | 1.3%  | 5.5%  | 4.4%  | 6.1%  | 4.3%  | 5.4%    |
| Species mix           | NA         | NA    | 11.2% | 6.7%  | 12.3% | 8.5%  | 5.5%  | 5.5%  | 8.3%    |
| Other cover crop      | 21.5%      | 7.4%  | 4.8%  | 1.1%  | 1.5%  | 5.3%  | 1.7%  | 0.6%  | 5.5%    |

| Commercial Nitrogen Application Practices:   | 2017  | 2018  | 2019  | 2020  | 2021  | 2022  | 2023  | 2024  | Average |
|----------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|---------|
| Fall anhydrous ammonia applied               | 38.9% | 24.1% | 23.5% | 28.9% | 43.1% | 50.3% | 49.5% | 42.0% | 37.5%   |
| Nitrapyrin inhibitor with anhydrous ammonia  | 72.6% | 73.9% | 84.8% | 83.8% | 86.0% | 64.7% |       |       | 77.7%   |
| EPA-labeled inhibitor with anhydrous ammonia |       |       |       |       |       | 63.1% |       | 62.0% | 62.6%   |
| Fall only                                    | NA    | NA    | 14.0% | 17.4% | 22.4% | 27.8% | 34.7% | 23.9% | 23.4%   |
| Spring pre-plant only                        | 42.1% | 56.3% | 50.9% | 46.7% | 40.3% | 33.8% | 36.5% | 41.9% | 43.6%   |
| Spring pre-plant & in-season                 | 9.9%  | 15.4% | 16.9% | 13.8% | 13.2% | 14.5% | 10.5% | 12.3% | 13.3%   |
| In-season only                               | 2.1%  | 1.1%  | 1.1%  | 3.8%  | 1.7%  | 1.0%  | 2.5%  | 1.8%  | 1.9%    |
| Fall & spring pre-plant                      | NA    | NA    | 11.6% | 9.7%  | 14.3% | 14.4% | 10.2% | 10.7% | 11.8%   |
| Fall & in-season                             | NA    | NA    | 3.2%  | 5.4%  | 4.7%  | 6.1%  | 3.7%  | 8.0%  | 5.2%    |
| Fall & spring & in-season                    | NA    | NA    | 2.3%  | 3.2%  | 3.4%  | 2.3%  | 2.0%  | 1.4%  | 2.4%    |
| Variable rate applied                        | NA    | NA    | 8.7%  | 10.1% | 16.1% | 9.8%  | 15.2% | 12.2% | 12.0%   |

| Manure Practices:                         | 2017  | 2018  | 2019  | 2020  | 2021  | 2022  | 2023  | 2024  | Average |
|-------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|---------|
| No manure used                            | 81.5% | 81.4% | 80.8% | 82.0% | 79.7% | 78.8% | 76.5% | 77.5% | 79.8%   |
| Beef manure used                          | 6.8%  | 10.3% | 8.8%  | 6.3%  | 9.5%  | 9.0%  | 11.8% | 10.2% | 9.1%    |
| Beef & poultry manure used                | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.0%  | 0.0%  |       |       | 0.0%    |
| Beef & liquid swine manure used           | 0.0%  | 0.0%  | 0.3%  | 0.1%  | 0.1%  | 0.2%  | 0.4%  | 0.1%  | 0.2%    |
| Liquid swine manure used                  | 7.6%  | 5.4%  | 7.4%  | 8.1%  | 8.1%  | 8.9%  | 8.3%  | 7.9%  | 7.7%    |
| Liquid swine & dairy manure used          | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.0%  | 0.0%  |       |       | 0.0%    |
| Poultry manure used                       | 1.6%  | 1.7%  | 1.9%  | 1.2%  | 1.6%  | 1.4%  | 1.7%  | 0.9%  | 1.5%    |
| Dairy manure used                         | 2.5%  | 1.1%  | 0.8%  | 2.1%  | 1.1%  | 1.7%  | 1.5%  | 3.3%  | 1.8%    |
| Dairy & beef manure used                  | 0.1%  | 0.2%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  |       |       | 0.0%    |
| Liquid swine manure fall applied          | 94.7% | 84.2% | 78.5% | 87.3% | 82.4% | 91.8% | 83.1% | 91.2% | 86.6%   |
| Liquid swine manure spring applied        | 1.8%  | 2.5%  | 11.7% | 3.4%  | 7.0%  | 4.7%  | 5.6%  | 0.0%  | 4.6%    |
| Liquid swine manure fall & spring applied | 3.5%  | 13.3% | 9.9%  | 9.4%  | 10.6% | 3.6%  | 11.3% | 8.8%  | 8.8%    |

| Phosphorus Application Practices:                  | 2017  | 2018  | 2019  | 2020  | 2021  | 2022  | 2023  | 2024  | Average |
|----------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|---------|
| Commercial P incorporated with planter             | 11.0% | 3.8%  | 1.2%  | 2.7%  | 0.6%  | 0.7%  | 1.6%  | 0.9%  | 2.8%    |
| Commercial P incorporated with knifed bands        | 2.9%  | 2.7%  | 2.7%  | 3.0%  | 2.7%  | 1.1%  | 4.0%  | 6.6%  | 3.2%    |
| Commercial P broadcast & incorporated in 1 week    | 47.0% | 70.3% | 69.1% | 40.4% | 43.2% | 37.9% | 31.4% | 31.6% | 46.4%   |
| Liquid P (commercial/manure) injected              | 1.8%  | 3.8%  | 8.9%  | 7.8%  | 5.0%  | 6.8%  | 5.6%  | 1.8%  | 5.2%    |
| Other P application type (unincorporated)          | 37.4% | 19.5% | 18.1% | 46.0% | 48.4% | 53.5% | 57.4% | 59.2% | 42.4%   |
| Variable rate applied                              | NA    | NA    | 49.6% | 45.7% | 57.0% | 52.8% | 61.5% | 58.3% | 54.2%   |
| Soil testing for P                                 | 81.2% | 72.1% | 85.5% | 80.6% | 81.2% | 79.6% | 82.2% | 77.1% | 79.9%   |
| P application only when at or below optimum levels | 74.3% | 94.4% | 94.3% | 99.1% | 98.2% | 95.4% | 91.0% | 94.9% | 92.7%   |

| Soil Test P Levels     | 2022 | 2023 | 2024 | Average |
|------------------------|------|------|------|---------|
| Average Bray-P1 (ppm)  | 31.2 | 34.4 | 33.7 | 33.1    |
| Average Olsen (ppm)    |      | 20.9 | 28.8 | 24.9    |
| Average Melich-3 (ppm) | 36.1 | 34.1 | 41.9 | 37.4    |

| Tillage Practices:                               | 2017  | 2018  | 2019  | 2020  | 2021  | 2022  | 2023  | 2024  | Average |
|--------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|---------|
| Conservation tillage before corn                 | 56.3% | 52.3% | 46.5% | 23.0% | 25.4% | 29.7% | 23.3% | 22.9% | 34.9%   |
| No-till before corn                              | 26.4% | 22.2% | 29.4% | 29.5% | 31.6% | 29.6% | 32.7% | 29.1% | 28.8%   |
| Conventional tillage before corn                 | NA    | 25.4% | 24.1% | 47.5% | 43.0% | 40.6% | 44.0% | 48.0% | 38.9%   |
| Conservation tillage before soy                  | 42.6% | 34.6% | 33.8% | 18.5% | 19.6% | 27.7% | 22.1% | 16.0% | 26.9%   |
| No-till before soy                               | 43.2% | 41.0% | 44.6% | 47.3% | 53.3% | 46.9% | 49.7% | 55.3% | 47.7%   |
| Conventional tillage before soy                  | NA    | 24.4% | 21.6% | 34.2% | 27.1% | 25.5% | 28.3% | 28.7% | 27.1%   |
| Combined corn & soy conservation tillage acreage | 50.5% | 44.6% | 41.3% | 21.1% | 22.9% | 28.8% | 22.7% | 19.9% | 31.5%   |
| Combined corn & soy no-till acreage              | 33.5% | 30.4% | 35.6% | 36.8% | 41.2% | 37.2% | 40.1% | 40.5% | 36.9%   |
| Combined corn & soy conventional tillage acreage | NA    | 25.0% | 23.1% | 42.1% | 35.9% | 33.9% | 37.2% | 39.6% | 33.8%   |

| Acres     |           |           |           |           |           |           |           |           |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 2017      | 2018      | 2019      | 2020      | 2021      | 2022      | 2023      | 2024      | Average   |
| 1,597,614 | 2,015,688 | 2,180,043 | 3,107,063 | 2,768,754 | 3,773,717 | 3,841,525 | 3,873,663 | 2,894,759 |
| 1,108,954 | 1,669,641 | 1,771,503 | 2,823,418 | 2,236,599 | 3,086,901 | 3,327,999 | 3,469,663 | 2,436,835 |
| 144,610   | 197,070   | 61,041    | 41,452    | 151,174   | 166,044   | 234,047   | 166,820   | 145,282   |
| NA        | NA        | 243,293   | 207,104   | 339,449   | 320,766   | 213,057   | 212,479   | 256,025   |
| 344,051   | 148,977   | 104,206   | 35,089    | 40,978    | 200,007   | 66,422    | 24,701    | 120,554   |

| Extrapolation      |
|--------------------|
| Extrapolated Using |
| Corn & soy acres   |
| Cover crop acres   |
| Cover crop acres   |
| Cover crop acres   |
| Cover crop acres   |

| 2017      | 2018      | 2019      | 2020      | 2021      | 2022      | 2023      | 2024      | Average   |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 5,136,775 | 3,135,808 | 3,210,126 | 3,980,920 | 5,532,236 | 6,381,504 | 6,342,262 | 5,490,474 | 4,901,263 |
| 3,731,524 | 2,318,399 | 2,722,508 | 3,337,435 | 4,759,936 | 4,128,833 | 0         | 0         | 2,999,805 |
| NA        | NA        | 1,916,249 | 2,396,375 | 2,871,940 | 3,526,954 | 4,440,985 | 3,126,364 | 3,030,501 |
| 5,563,671 | 7,331,631 | 6,949,814 | 6,443,443 | 5,165,387 | 4,288,167 | 4,668,057 | 5,475,018 | 5,772,882 |
| 1,307,086 | 2,004,263 | 2,299,772 | 1,907,536 | 1,691,866 | 1,839,598 | 1,343,120 | 1,608,801 | 1,770,463 |
| 281,723   | 137,166   | 147,404   | 529,108   | 219,340   | 126,869   | 318,438   | 240,305   | 250,044   |
| NA        | NA        | 1,581,861 | 1,335,708 | 1,835,527 | 1,826,912 | 1,310,425 | 1,396,726 | 1,578,087 |
| NA        | NA        | 434,022   | 738,667   | 596,450   | 773,900   | 470,882   | 1,045,804 | 602,784   |
| NA        | NA        | 319,375   | 442,967   | 441,245   | 291,798   | 253,127   | 189,216   | 349,702   |
| NA        | NA        | 1,180,595 | 1,386,830 | 2,058,715 | 1,243,315 | 1,950,131 | 1,591,699 | 1,563,917 |

| Extrapolated Using           |
|------------------------------|
| Corn acres                   |
| Fall anhydrous ammonia acres |
| Fall anhydrous ammonia acres |
| Corn acres                   |
| Corn acres                   |
| Corn acres                   |
| Corn acres                   |
| Corn acres                   |
| Corn acres                   |
| Corn acres                   |

| 2017       | 2018       | 2019       | 2020       | 2021       | 2022      | 2023      | 2024       | Average    |
|------------|------------|------------|------------|------------|-----------|-----------|------------|------------|
| 10,765,242 | 10,590,004 | 11,030,715 | 11,310,374 | 10,223,669 | 9,997,266 | 9,791,557 | 10,144,605 | 10,481,679 |
| 900,069    | 1,343,993  | 1,194,243  | 864,553    | 1,212,141  | 1,141,820 | 1,505,522 | 1,337,986  | 1,187,541  |
| 0          | 0          | 0          | 12,388     | 0          | 0         |           |            | 2,065      |
| 0          | 0          | 38,216     | 19,715     | 11,416     | 25,374    | 46,339    | 13,872     | 19,366     |
| 998,307    | 700,854    | 1,011,354  | 1,123,205  | 1,035,130  | 1,129,133 | 1,058,156 | 1,038,252  | 1,011,799  |
| 0          | 0          | 0          | 8,585      | 0          | 0         |           |            | 1,431      |
| 207,798    | 215,760    | 262,051    | 159,361    | 202,665    | 177,616   | 213,102   | 117,314    | 194,458    |
| 324,858    | 141,833    | 111,918    | 295,623    | 138,530    | 215,677   | 190,358   | 430,206    | 231,125    |
| 16,638     | 19,763     | 0          | 0          | 0          | 0         |           |            | 6,067      |
| 945,796    | 590,008    | 823,597    | 1,004,791  | 862,040    | 1,059,837 | 918,133   | 959,794    | 895,499    |
| 17,504     | 17,446     | 122,590    | 38,639     | 73,447     | 54,262    | 61,629    | 0          | 48,189     |
| 35,007     | 93,400     | 103,488    | 108,076    | 111,028    | 41,562    | 124,732   | 92,331     | 88,703     |

| Extrapolated Using |
|--------------------|
| Corn acres         |
| Corn acres         |
| Corn acres         |
| Corn acres         |
| Corn acres         |
| Corn acres         |
| Corn acres         |
| Corn acres         |
| Corn acres         |
| Swine manure acres |
| Swine manure acres |
| Swine manure acres |

| 2017       | 2018       | 2019       | 2020       | 2021       | 2022       | 2023       | 2024       | Average    |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| 2,529,464  | 872,820    | 275,084    | 630,389    | 137,863    | 159,133    | 361,439    |            | 709,456    |
| 656,919    | 627,900    | 618,940    | 692,078    | 625,440    | 250,066    | 915,394    | 204,018    | 573,844    |
| 10,807,030 | 16,143,905 | 15,847,147 | 9,440,934  | 9,916,964  | 8,615,897  | 7,110,864  | 7,326,759  | 10,651,188 |
| 416,049    | 865,364    | 2,049,378  | 1,825,232  | 1,155,754  | 1,545,860  | 1,258,882  | 422,546    | 1,192,383  |
| 8,591,331  | 4,468,931  | 4,137,726  | 10,750,218 | 11,130,161 | 12,162,282 | 13,008,560 | 13,730,126 | 9,747,417  |
| NA         | NA         | 11,358,688 | 10,677,472 | 13,106,201 | 12,003,149 | 13,937,564 | 13,542,364 | 12,437,573 |
| 18,682,577 | 16,563,845 | 19,602,047 | 18,818,176 | 18,662,091 | 18,095,657 | 18,625,588 | 17,892,531 | 18,367,814 |
| 13,875,230 | 15,636,269 | 18,482,770 | 18,653,889 | 18,329,906 | 17,263,256 | 16,947,816 | 16,973,400 | 17,020,317 |

| Extrapolated Using         |
|----------------------------|
| Corn & soy acres           |
| Corn & soy acres           |
| Corn & soy acres           |
| Corn & soy acres           |
| Corn & soy acres           |
| Corn & soy acres           |
| Corn & soy acres           |
| Corn & soy acres           |
| Corn & soy acres           |
| Soil test phosphorus acres |

| 2017       | 2018       | 2019      | 2020      | 2021      | 2022      | 2023      | 2024      | Average   |
|------------|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 7,441,970  | 6,805,748  | 6,341,092 | 3,171,203 | 3,260,594 | 3,768,005 | 2,977,177 | 2,995,644 | 4,823,684 |
| 3,486,345  | 2,890,908  | 4,018,117 | 4,071,389 | 4,052,013 | 3,755,318 | 4,188,876 | 3,805,549 | 3,780,424 |
| NA         | 3,299,680  | 3,289,288 | 6,551,214 | 5,512,867 | 5,150,876 | 5,638,982 | 6,281,041 | 4,907,151 |
| 4,169,316  | 3,441,481  | 3,134,088 | 1,764,290 | 1,993,219 | 2,782,839 | 2,173,803 | 1,623,454 | 2,779,862 |
| 4,221,350  | 4,081,526  | 4,134,881 | 4,517,853 | 5,409,108 | 4,711,739 | 4,892,801 | 5,602,069 | 4,567,037 |
| NA         | 2,433,727  | 2,006,224 | 3,271,784 | 2,746,678 | 2,561,820 | 2,783,500 | 2,903,099 | 2,633,956 |
| 11,611,287 | 10,247,229 | 9,475,179 | 4,935,493 | 5,253,814 | 6,550,844 | 5,150,980 | 4,619,099 | 7,603,547 |
| 7,707,695  | 6,972,434  | 8,152,999 | 8,589,242 | 9,461,121 | 8,467,057 | 9,081,467 | 9,407,618 | 8,347,461 |
| NA         | 5,733,407  | 5,295,512 | 9,822,908 | 8,259,545 | 7,712,695 | 8,022,482 | 9,184,140 | 7,541,107 |



## 2017-2024 Crop Year Survey Data: Corn & Soy Acres

This part of the survey starts with statewide corn and soybean acre data from USDA. These numbers form the foundation for the rest of INREC's analysis because they help paint a picture of what's happening across Iowa farmland.

Acre trends matter because they drive almost everything else: fertility needs, crop rotations, cover crop opportunities, and conservation impact. When corn or soybean acres shift, it is usually due to a mix of factors such as crop prices, input costs, weather, or global markets. For example, a wet spring might push more acres into soybeans, while strong corn prices could pull them back the following year.

Changes in total acres also affect how we interpret conservation practice adoption. Tracking acre trends alongside management practices gives a clearer sense of what is really happening on the ground

| Corn & Soy Acres             | 2017       | 2018       | 2019       | 2020       | 2021       | 2022       | 2023       | 2024       | Average    |
|------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Corn acres (CDL)             | 13,212,913 | 13,012,207 | 13,648,497 | 13,793,805 | 12,826,886 | 12,686,886 | 12,805,034 | 13,133,558 | 13,139,973 |
| Soy acres (CDL)              | 9,782,215  | 9,956,734  | 9,275,193  | 9,553,928  | 10,150,325 | 10,046,351 | 9,850,104  | 10,128,623 | 9,842,934  |
| Corn & soy acres total (CDL) | 22,995,128 | 22,968,941 | 22,923,690 | 23,347,733 | 22,977,211 | 22,733,237 | 22,655,138 | 23,210,857 | 22,976,492 |

CDL = USDA Cropland Data Layer

These numbers are extrapolated using USDA's corn and soybean acre numbers across Iowa.

Out of the 600+ agricultural retailers in Iowa, 150 retail locations are selected at random and stratified across eight major land resource areas based on the percentage of row crops each year. About 1,000 of the potential 1,500 surveys are completed, ensuring oversampling of Iowa State University's target of 500 surveys for statistical significance.

INREC aggregates the data to ensure confidentiality, and the Iowa State University Center of Survey Statistics Methodology extrapolates the data for statewide adoption. Iowa State University models nutrient load reduction based on performances documented in the NRS science assessment.



# 2017-2024 Crop Year Survey Data: Commercial Only Nitrogen Rates

When we look at commercial-only nitrogen rates, we’re talking about fertilizer that comes strictly from commercial sources—no manure inputs. Since 2017, those rates have stayed fairly steady. That tells us farmers are applying what the crop needs, not more, not less. It also shows a good balance between increasing yields and protecting water quality.

| Commercial Only Nitrogen Rates (lb/ac)           | 2017  | 2018  | 2019  | 2020  | 2021  | 2022  | 2023  | 2024  | Average |
|--------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|---------|
| Average N rate on corn following soy in rotation | 170.0 | 172.3 | 177.5 | 183.4 | 170.9 | 173.4 | 166.6 | 179.2 | 174.2   |
| Average N rate on continuous corn                | 200.4 | 201.9 | 200.4 | 208.9 | 199.9 | 192.6 | 185.7 | 205.0 | 199.4   |

These numbers are extrapolated using USDA's corn and soybean acre numbers across Iowa.

Out of the 600+ agricultural retailers in Iowa, 150 retail locations are selected at random and stratified across eight major land resource areas based on the percentage of row crops each year. About 1,000 of the potential 1,500 surveys are completed.

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## 2017-2024 Crop Year Survey Data: Crop Rotation

This section highlights how farmers are rotating crops, whether it is the standard corn-soybean rotation or longer cycles that include small grains, hay or forage.

Healthy rotations help break pest and disease cycles, improve soil structure and spread out weather and market risks. Rotation decisions depend on several factors, including weather, yield expectations, input costs and available markets.

| Crop Rotation        | 2022  | 2023  | 2024  | Average |
|----------------------|-------|-------|-------|---------|
| Continuous Corn      | 10.6% | 12.7% | 11.6% | 11.6%   |
| Corn-Soy             | 85.3% | 84.6% | 81.7% | 83.9%   |
| Extended Rotation    | 2.0%  | 1.4%  | 3.3%  | 2.2%    |
| Corn-Small Grain-Soy | 0.2%  | 0.1%  | 0.3%  | 0.2%    |
| Other                | 1.9%  | 1.2%  | 3.1%  | 2.1%    |

*These numbers are extrapolated using USDA's corn and soybean acre numbers across Iowa.*

*Out of the 600+ agricultural retailers in Iowa, 150 retail locations are selected at random and stratified across eight major land resource areas based on the percentage of row crops each year. About 1,000 of the potential 1,500 surveys are completed, ensuring oversampling of Iowa State University's target of 500 surveys for statistical significance.*

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## 2017-2024 Crop Year Survey Data: Cover Crop Practices

Here you will find data on how many acres are planted with cover crops, the percentage of total acres that represents and how adoption has changed over time. Cover crops protect soil from erosion, hold nutrients such as nitrogen and build organic matter. They are one of the few practices that reduce both nitrogen and phosphorus loss. These benefits align with the goals of the Iowa Nutrient Reduction Strategy.

Research from Iowa State University shows that rye cover crops can reduce nitrate losses by around 30% compared to no cover crop in a corn-soybean rotation. Adoption usually grows gradually rather than all at once. Costs, weather and timing all play a role. A late fall or wet spring can make planting or terminating cover crops difficult. For some farmers, the uncertainty of short-term results also slows adoption.

| Cover Crop Practices   Percentage | 2017  | 2018  | 2019  | 2020  | 2021  | 2022  | 2023  | 2024  | Average |
|-----------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|---------|
| Cover crop planted                | 6.9%  | 8.8%  | 9.5%  | 13.3% | 12.1% | 16.6% | 17.0% | 16.7% | 12.6%   |
| Rye cover crop                    | 69.4% | 82.8% | 81.3% | 90.9% | 80.8% | 81.8% | 86.6% | 89.6% | 82.9%   |
| Oat cover crop                    | 9.1%  | 9.8%  | 2.8%  | 1.3%  | 5.5%  | 4.4%  | 6.1%  | 4.3%  | 5.4%    |
| Species mix                       | NA    | NA    | 11.2% | 6.7%  | 12.3% | 8.5%  | 5.5%  | 5.5%  | 8.3%    |
| Other cover crop                  | 21.5% | 7.4%  | 4.8%  | 1.1%  | 1.5%  | 5.3%  | 1.7%  | 0.6%  | 5.5%    |

| Cover Crop Practices   Acres | 2017      | 2018      | 2019      | 2020      | 2021      | 2022      | 2023      | 2024      | Average   |
|------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Cover crop planted           | 1,597,614 | 2,015,688 | 2,180,043 | 3,107,063 | 2,768,754 | 3,773,717 | 3,841,525 | 3,873,663 | 2,894,759 |
| Rye cover crop               | 1,108,954 | 1,669,641 | 1,771,503 | 2,823,418 | 2,236,599 | 3,086,901 | 3,327,999 | 3,469,663 | 2,436,835 |
| Oat cover crop               | 144,610   | 197,070   | 61,041    | 41,452    | 151,174   | 166,044   | 234,047   | 166,820   | 145,282   |
| Species mix                  | NA        | NA        | 243,293   | 207,104   | 339,449   | 320,766   | 213,057   | 212,479   | 256,025   |
| Other cover crop             | 344,051   | 148,977   | 104,206   | 35,089    | 40,978    | 200,007   | 66,422    | 24,701    | 120,554   |

*These numbers are extrapolated using USDA's corn and soybean acre numbers across Iowa.*

*Out of the 600+ agricultural retailers in Iowa, 150 retail locations are selected at random and stratified across eight major land resource areas based on the percentage of row crops each year. About 1,000 of the potential 1,500 surveys are completed, ensuring oversampling of Iowa State University's target of 500 surveys for statistical significance.*

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## 2017-2024 Crop Year Survey Data: Commercial Nitrogen Application Practices

Here, we are looking at how nitrogen from commercial fertilizer is being applied, how timing and methods are changing and how those adjustments tie into nutrient-loss goals. Managing nitrogen is a key part of the Nutrient Reduction Strategy since excess nitrogen contributes to water quality challenges. The “4Rs” approach (right rate, right source, right time, right place) guides this effort.

Survey data shows nitrogen rates holding steady, which suggests farmers are applying responsibly and following best practices. Even small year-to-year changes can point to larger factors, such as fertilizer price swings, yield expectations, soil nitrogen levels, or weather challenges like wet or dry springs. Nitrification inhibitor adoption is strong, protecting fall applied nitrogen from loss. Timing can vary with weather and fertilizer prices but spring is the most widely used application time with a variety of combinations of fall, spring, and in-season timing used.

| Commercial Nitrogen Application Practices   Percentage | 2017  | 2018  | 2019  | 2020  | 2021  | 2022  | 2023  | 2024  | Average |
|--------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|---------|
| Fall anhydrous ammonia applied                         | 38.9% | 24.1% | 23.5% | 28.9% | 43.1% | 50.3% | 49.5% | 42.0% | 37.5%   |
| Nitrapyrin inhibitor with fall anhydrous ammonia       | 72.6% | 73.9% | 84.8% | 83.8% | 86.0% | 64.7% | 0     | 0     | 77.7    |
| EPA labeled inhibitor with fall anhydrous ammonia      | 0     | 0     | 0     | 0     | 0     | 0     | 63.1% | 62.0% | 62.6%   |
| Fall only                                              | NA    | NA    | 14.0% | 17.4% | 22.4% | 27.8% | 34.7% | 23.9% | 23.4%   |
| Spring pre-plant only                                  | 42.1% | 56.3% | 50.9% | 46.7% | 40.3% | 33.8% | 36.5% | 41.9% | 43.6%   |
| Spring pre-plant & in-season                           | 9.9%  | 15.4% | 16.9% | 13.8% | 13.2% | 14.5% | 10.5% | 12.3% | 13.3%   |
| In-season only                                         | 2.1%  | 1.1%  | 1.1%  | 3.8%  | 1.7%  | 1.0%  | 2.5%  | 1.8%  | 1.9%    |
| Fall & spring pre-plant                                | NA    | NA    | 11.6% | 9.7%  | 14.3% | 14.4% | 10.2% | 10.7% | 11.8%   |
| Fall & in-season                                       | NA    | NA    | 3.2%  | 5.4%  | 4.7%  | 6.1%  | 3.7%  | 8.0%  | 5.2%    |
| Fall & spring & in-season                              | NA    | NA    | 2.3%  | 3.2%  | 3.4%  | 2.3%  | 2.0%  | 1.4%  | 2.4%    |
| Variable rate applied                                  | NA    | NA    | 8.7%  | 10.1% | 16.1% | 9.8%  | 15.2% | 12.2% | 12.0%   |

| Commercial Nitrogen Application Practices   Acres | 2017      | 2018      | 2019      | 2020      | 2021      | 2022      | 2023      | 2024      | Average   |
|---------------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Fall anhydrous ammonia applied                    | 5,136,775 | 3,135,808 | 3,210,126 | 3,980,920 | 5,532,236 | 6,381,504 | 6,342,262 | 5,490,474 | 4,901,263 |
| Nitrapyrin inhibitor with anhydrous ammonia       | 3,731,524 | 2,318,399 | 2,722,508 | 3,337,435 | 4,759,936 | 4,128,833 | 0         | 0         | 3,426,660 |
| EPA labeled inhibitor with anhydrous ammonia      | 0         | 0         | 0         | 0         | 0         | 0         | 3,999,546 | 3,406,400 | 3,406,400 |
| Fall only                                         | NA        | NA        | 1,916,249 | 2,396,375 | 2,871,940 | 3,526,954 | 4,440,985 | 3,126,364 | 3,030,501 |
| Spring pre-plant only                             | 5,563,671 | 7,331,631 | 6,949,814 | 6,443,443 | 5,165,387 | 4,288,167 | 4,668,057 | 5,475,018 | 5,772,882 |
| Spring pre-plant & in-season                      | 1,307,086 | 2,004,263 | 2,299,772 | 1,907,536 | 1,691,866 | 1,839,598 | 1,343,120 | 1,608,801 | 1,770,463 |
| In-season only                                    | 281,723   | 137,166   | 147,404   | 529,108   | 219,340   | 126,869   | 318,438   | 240,305   | 251,435   |
| Fall & spring pre-plant                           | NA        | NA        | 1,581,861 | 1,335,708 | 1,835,527 | 1,826,912 | 1,310,425 | 1,396,726 | 1,578,087 |
| Fall & in-season                                  | NA        | NA        | 434,022   | 738,667   | 596,450   | 773,900   | 470,882   | 1,045,804 | 602,784   |
| Fall & spring & in-season                         | NA        | NA        | 319,375   | 442,967   | 441,245   | 291,798   | 253,127   | 189,216   | 349,702   |
| Variable rate applied                             | NA        | NA        | 1,180,595 | 1,386,830 | 2,058,715 | 1,243,315 | 1,950,131 | 1,591,699 | 1,563,917 |

These numbers are extrapolated using USDA's corn and soybean acre numbers across Iowa.

Years without data reflect how survey questions evolve with the NRS science assessment as practices are added or refined.

Out of the 600+ agricultural retailers in Iowa, 150 retail locations are selected at random and stratified across eight major land resource areas based on the percentage of row crops each year. About 1,000 of the potential 1,500 surveys are completed, ensuring oversampling of Iowa State University's target of 500 surveys for statistical significance.

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## 2017-2024 Crop Year Survey Data: Manure Practices

These numbers reflect how manure is being used, including how many acres receive it, what types are applied and when applications occur. Manure remains a key nutrient source for Iowa farmers, providing nitrogen, phosphorus and organic matter that feed the soil.

Fall application is still the most common, although spring application is slowly increasing as farmers look to better match nutrient release with crop needs. While Iowa is a large producer of livestock, approximately 80% of the corn acres receive no manure.

| Manure Practices   Percentage             | 2017  | 2018  | 2019  | 2020  | 2021  | 2022  | 2023  | 2024  | Average |
|-------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|---------|
| No manure used                            | 81.5% | 81.4% | 80.8% | 82.0% | 79.7% | 78.8% | 76.5% | 77.5% | 79.8%   |
| Beef manure used                          | 6.8%  | 10.3% | 8.8%  | 6.3%  | 9.5%  | 9.0%  | 11.8% | 10.2% | 9.1%    |
| Beef & poultry manure used                | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.0%  | 0.0%  |       |       | 0.0%    |
| Beef & liquid swine manure used           | 0.0%  | 0.0%  | 0.3%  | 0.1%  | 0.1%  | 0.2%  | 0.4%  | 0.1%  | 0.2%    |
| Liquid swine manure used                  | 7.6%  | 5.4%  | 7.4%  | 8.1%  | 8.1%  | 8.9%  | 8.3%  | 7.9%  | 7.7%    |
| Liquid swine & dairy manure used          | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.0%  | 0.0%  |       |       | 0.0%    |
| Poultry manure used                       | 1.6%  | 1.7%  | 1.9%  | 1.2%  | 1.6%  | 1.4%  | 1.7%  | 0.9%  | 1.5%    |
| Dairy manure used                         | 2.5%  | 1.1%  | 0.8%  | 2.1%  | 1.1%  | 1.7%  | 1.5%  | 3.3%  | 1.8%    |
| Dairy & beef manure used                  | 0.1%  | 0.2%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  |       |       | 0.0%    |
| Liquid swine manure fall applied          | 94.7% | 84.2% | 78.5% | 87.3% | 82.4% | 91.8% | 83.1% | 91.2% | 86.6%   |
| Liquid swine manure spring applied        | 1.8%  | 2.5%  | 11.7% | 3.4%  | 7.0%  | 4.7%  | 5.6%  | 0.0%  | 4.6%    |
| Liquid swine manure fall & spring applied | 3.5%  | 13.3% | 9.9%  | 9.4%  | 10.6% | 3.6%  | 11.3% | 8.8%  | 8.8%    |

| Manure Practices   Acres                  | 2017       | 2018       | 2019       | 2020       | 2021       | 2022      | 2023      | 2024       | Average    |
|-------------------------------------------|------------|------------|------------|------------|------------|-----------|-----------|------------|------------|
| No manure used                            | 10,765,242 | 10,590,004 | 11,030,715 | 11,310,374 | 10,223,669 | 9,997,266 | 9,791,557 | 10,144,605 | 10,481,679 |
| Beef manure used                          | 900,069    | 1,343,993  | 1,194,243  | 864,553    | 1,212,141  | 1,141,820 | 1,505,522 | 1,337,986  | 1,187,541  |
| Beef & poultry manure used                | 0          | 0          | 0          | 12,388     | 0          | 0         |           |            | 2,065      |
| Beef & liquid swine manure used           | 0          | 0          | 38,216     | 19,715     | 11,416     | 25,374    | 46,339    | 13,872     | 19,366     |
| Liquid swine manure used                  | 998,307    | 700,854    | 1,011,354  | 1,123,205  | 1,035,130  | 1,129,133 | 1,058,156 | 1,038,252  | 1,011,799  |
| Liquid swine & dairy manure used          | 0          | 0          | 0          | 8,585      | 0          | 0         |           |            | 1,431      |
| Poultry manure used                       | 207,798    | 215,760    | 262,051    | 159,361    | 202,665    | 177,616   | 213,102   | 117,314    | 194,458    |
| Dairy manure used                         | 324,858    | 141,833    | 111,918    | 295,623    | 138,530    | 215,677   | 190,358   | 430,206    | 231,125    |
| Dairy & beef manure used                  | 16,638     | 19,763     | 0          | 0          | 0          | 0         |           |            | 6,067      |
| Liquid swine manure fall applied          | 945,796    | 590,008    | 823,597    | 1,004,791  | 862,040    | 1,059,837 | 918,133   | 959,794    | 895,499    |
| Liquid swine manure spring applied        | 17,504     | 17,446     | 122,590    | 38,639     | 73,447     | 54,262    | 61,629    | 0          | 48,189     |
| Liquid swine manure fall & spring applied | 35,007     | 93,400     | 103,488    | 108,076    | 111,028    | 41,562    | 124,732   | 92,331     | 88,703     |

These numbers are extrapolated using USDA's corn and soybean acre numbers across Iowa.

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## 2017-2024 Crop Year Survey Data: Phosphorus Application Practices

When we look at this category, we see the methods of application, the use of soil testing and how practices have evolved over time.

Targeted applications, such as commercial phosphorus incorporated with the planter, knifed bands or liquid injection, are less common but show modest adoption, with variability by year and field conditions. Some type of incorporation is the best practice to reduce soil erosion and phosphorus loss. Soil testing remains central to phosphorus management, with nearly 80% of fields tested for phosphorus, and most applications occurring when soil-test levels are at or below optimum, ensuring efficient use of nutrients and minimizing environmental impact.

| Phosphorus Application Practices   Percentage      | 2017  | 2018  | 2019  | 2020  | 2021  | 2022  | 2023  | 2024  | Average |
|----------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|---------|
| Commercial P incorporated with planter             | 11.0% | 3.8%  | 1.2%  | 2.7%  | 0.6%  | 0.7%  | 1.6%  | 0.90% | 2.8%    |
| Commercial P incorporated with knifed bands        | 2.9%  | 2.7%  | 2.7%  | 3.0%  | 2.7%  | 1.1%  | 4.0%  | 6.6%  | 3.2%    |
| Commercial P broadcast & incorporated in 1 week    | 47.0% | 70.3% | 69.1% | 40.4% | 43.2% | 37.9% | 31.4% | 31.6% | 46.4%   |
| Liquid P (commercial/manure) injected              | 1.8%  | 3.8%  | 8.9%  | 7.8%  | 5.0%  | 6.8%  | 5.6%  | 1.8%  | 5.2%    |
| Other P application type (unincorporated)          | 37.4% | 19.5% | 18.1% | 46.0% | 48.4% | 53.5% | 57.4% | 59.2% | 42.4%   |
| Variable rate applied                              | NA    | NA    | 49.6% | 45.7% | 57.0% | 52.8% | 61.5% | 58.3% | 54.2%   |
| Soil testing for P                                 | 81.2% | 72.1% | 85.5% | 80.6% | 81.2% | 79.6% | 82.2% | 77.1% | 79.9%   |
| P application only when at or below optimum levels | 74.3% | 94.4% | 94.3% | 99.1% | 98.2% | 95.4% | 91.0% | 94.9% | 92.7%   |

| Phosphorus Application Practices   Acres           | 2017       | 2018       | 2019       | 2020       | 2021       | 2022       | 2023       | 2024       | Average    |
|----------------------------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Commercial P incorporated with planter             | 656,919    | 627,900    | 618,940    | 692,078    | 625,440    | 250,066    | 915,394    | 204,018    | 573,844    |
| Commercial P broadcast & incorporated in 1 week    | 10,807,030 | 16,143,905 | 15,847,147 | 9,440,934  | 9,916,964  | 8,615,897  | 7,110,864  | 7,326,759  | 10,651,188 |
| Liquid P (commercial/manure) injected              | 416,049    | 865,364    | 2,049,378  | 1,825,232  | 1,155,754  | 1,545,860  | 1,258,882  | 422,546    | 1,192,383  |
| Other P application type (unincorporated)          | 8,591,331  | 4,468,931  | 4,137,726  | 10,750,218 | 11,130,161 | 12,162,282 | 13,008,560 | 13,730,126 | 9,747,417  |
| Variable rate applied                              | NA         | NA         | 11,358,688 | 10,677,472 | 13,106,201 | 12,003,149 | 13,937,564 | 13,542,364 | 12,437,573 |
| Soil testing for P                                 | 18,682,577 | 16,563,845 | 19,602,047 | 18,818,176 | 18,662,091 | 18,095,657 | 18,625,588 | 17,892,531 | 18,367,814 |
| P application only when at or below optimum levels | 13,875,230 | 15,636,269 | 18,482,770 | 18,653,889 | 18,329,906 | 17,263,256 | 16,947,816 | 16,973,400 | 17,020,317 |

These numbers are extrapolated using USDA's corn and soybean acre numbers across Iowa.

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# 2017-2024 Crop Year Survey Data: Soil Test P Levels

This section shows the statewide average of soil test phosphorus levels across the three most common soil testing methods. Monitoring soil-test phosphorus helps ensure fertilizer is applied only where needed, supporting both yield and environmental goals.

| Soil Test P Levels     | 2022 | 2023 | 2024 | Average |
|------------------------|------|------|------|---------|
| Average Bray-P1 (ppm)  | 31.2 | 34.4 | 33.7 | 33.1    |
| Average Olsen (ppm)    |      | 20.9 | 28.8 | 24.9    |
| Average Melich-3 (ppm) | 36.1 | 34.1 | 41.9 | 37.4    |

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This section breaks down the tillage methods used before corn and soybeans and how those patterns have shifted over time. Reducing tillage leaves more crop residue to protect the soil from erosion, which reduces phosphorus loss.

Conservation tillage and no-till continue to play major roles in Iowa cropping systems. No-till is especially common before soybeans, while conservation tillage remains a popular choice before corn. Overall, the trend continues toward less intensive tillage as farmers look to improve soil health, protect water quality and support long-term productivity.

| Tillage Practices   Percentage                   | 2017  | 2018  | 2019  | 2020  | 2021  | 2022  | 2023  | 2024  | Average |
|--------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|---------|
| Conservation tillage before corn                 | 56.3% | 52.3% | 46.5% | 23.0% | 25.4% | 29.7% | 23.3% | 22.9% | 34.9%   |
| No-till before corn                              | 26.4% | 22.2% | 29.4% | 29.5% | 31.6% | 29.6% | 32.7% | 29.1% | 28.8%   |
| Conventional tillage before corn                 | NA    | 25.4% | 24.1% | 47.5% | 43.0% | 40.6% | 44.0% | 48.0% | 38.9%   |
| Conservation tillage before soy                  | 42.6% | 34.6% | 33.8% | 18.5% | 19.6% | 27.7% | 22.1% | 16.0% | 26.9%   |
| No-till before soy                               | 43.2% | 41.0% | 44.6% | 47.3% | 53.3% | 46.9% | 49.7% | 55.3% | 47.7%   |
| Conventional tillage before soy                  | NA    | 24.4% | 21.6% | 34.2% | 27.1% | 25.5% | 28.3% | 28.7% | 27.1%   |
| Combined corn & soy conservation tillage acreage | 50.5% | 44.6% | 41.3% | 21.1% | 22.9% | 28.8% | 22.7% | 19.9% | 31.5%   |
| Combined corn & soy no-till acreage              | 0.335 | 30.4% | 35.6% | 36.8% | 41.2% | 37.2% | 40.1% | 40.5% | 36.9%   |
| Combined corn & soy conventional tillage acreage | NA    | 25.0% | 23.1% | 42.1% | 35.9% | 33.9% | 37.2% | 39.6% | 33.8%   |

| Tillage Practices   Acres                        | 2017       | 2018       | 2019      | 2020      | 2021      | 2022      | 2023      | 2024      | Average   |
|--------------------------------------------------|------------|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Conservation tillage before corn                 | 7,441,970  | 6,805,748  | 6,341,092 | 3,171,203 | 3,260,594 | 3,768,005 | 2,977,177 | 2,995,644 | 4,823,684 |
| No-till before corn                              | 3,486,345  | 2,890,908  | 4,018,117 | 4,071,389 | 4,052,013 | 3,755,318 | 4,188,876 | 3,805,549 | 3,780,424 |
| Conventional tillage before corn                 | NA         | 3,299,680  | 3,289,288 | 6,551,214 | 5,512,867 | 5,150,876 | 5,638,982 | 6,281,041 | 4,907,151 |
| Conservation tillage before soy                  | 4,169,316  | 3,441,481  | 3,134,088 | 1,764,290 | 1,993,219 | 2,782,839 | 2,173,803 | 1,623,454 | 2,779,862 |
| No-till before soy                               | 4,221,350  | 4,081,526  | 4,134,881 | 4,517,853 | 5,409,108 | 4,711,739 | 4,892,801 | 5,602,069 | 4,567,037 |
| Conventional tillage before soy                  | NA         | 2,433,727  | 2,006,224 | 3,271,784 | 2,746,678 | 2,561,820 | 2,783,500 | 2,903,099 | 2,633,956 |
| Combined corn & soy conservation tillage acreage | 11,611,287 | 10,247,229 | 9,475,179 | 4,935,493 | 5,253,814 | 6,550,844 | 5,150,980 | 4,619,099 | 7,603,547 |
| Combined corn & soy no-till acreage              | 7,707,695  | 6,972,434  | 8,152,999 | 8,589,242 | 9,461,121 | 8,467,057 | 9,081,676 | 9,407,618 | 8,347,461 |
| Combined corn & soy conventional tillage acreage | NA         | 5,733,407  | 5,295,512 | 9,822,998 | 8,259,545 | 7,712,695 | 8,422,482 | 9,184,140 | 7,541,107 |

These numbers are extrapolated using USDA's corn and soybean acre numbers across Iowa.

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