CFAES

COLLEGE OF FOOD, AGRICULTURAL, AND ENVIRONMENTAL SCIENCES

2022
Ohio Agronomic Crops Production Survey

THE OHIO STATE UNIVERSITY
EXTENSION

AUTHORS

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CONTENTS

LIST OF FIGURES

INTRODUCTION

The Ohio State University Agronomic Crops Team conducted an electronic survey in May – July 2022 of growers and agribusiness professionals on management practices in Ohio. Respondents directly managing or advising crop acres were asked a suite of questions pertaining to tillage, genetic packages, pesticide and fertilizer use, precision technology adoption, cover cropping, and other management practices. The survey was directly emailed to 5,685 C.O.R.N. newsletter subscribers resulting in 480 completed responses representing 9 countries and 23 states. Of these 480 responses, 398 were Ohio residents representing 69 out of 88 total counties with an average of five survey participants per county (Figure 1). The results presented in this report are based on the 398 responses from Ohio residents.

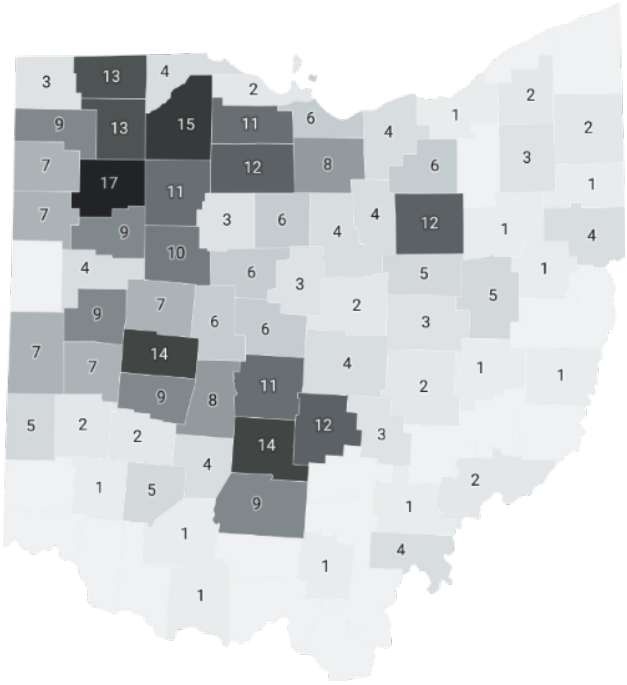

Figure 1. *Respondent location by county.*

Survey participants were asked to identify their primary occupation. The 398 responses from Ohio residents were comprised of the following:

- 67% Farmer, Farm Manager, or Farm Employee
- 13% Education or Agency
- 11% Agronomist, Crop Consultant
- 5% Agronomy Retail Sale/Application
- 4% Other Agribusiness

CORN PRODUCTION

The majority of farmers and those in retail or agronomic support positions grew or advised corn acres in 2022. Approximately one third of participating farmers, farm managers, and farm employees grew less than 200, 201-500, and 501-2,000 corn acres each (Figure 2). About

80% of respondents in the agronomy retail sales/application or agronomist categories advised more than 5,000 corn acres in 2022 (Figure 3).

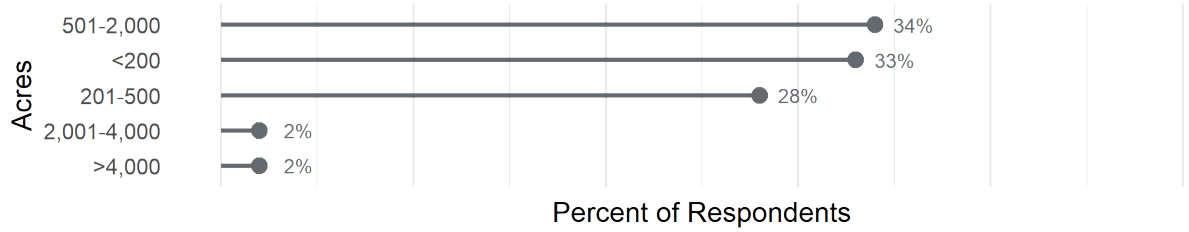

Figure 2. *Number of corn acres farmers, farm managers, and farm employees intended to plant in 2022.*

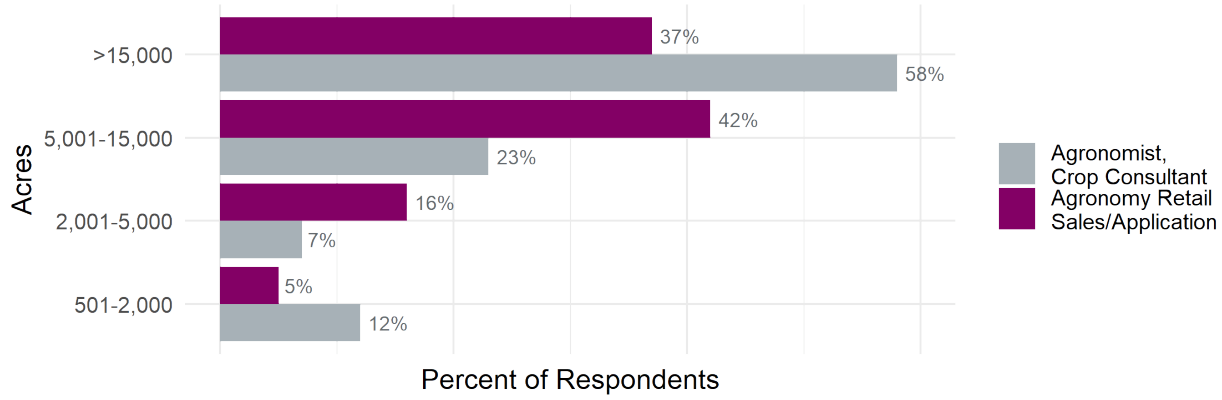

Figure 3. *Approximate number of corn acres serviced.*

In Ohio, 96% of corn grown was intended for grain; 3% for silage; 1% for earlage; and less than 1% for ear corn. The predominant row spacing for corn in 2022 was 25-33 inches. More than half (56%) of the reported corn acres had an average seeding rate of 32,001-34,000 seeds per acre. An average seeding rate of 30,001-32,000 seeds per acre was used on 24% of acres.

Fungicide use in corn varied across farmers, farm managers, and farm employees, with 44% making their decision based on scouting and other integrated pest management (IPM) practices. However, 17% and 12% of growers indicated they apply fungicide every year on some acres or all acres, respectively, regardless of disease presence. 26% never use fungicide, and 1% only use fungicide when corn price is greater than $4.50 per bushel.

Respondents growing corn acres in 2022 reported 45% of planned acreage in no-till, 24% using convention tillage (plowed, ripped, or chiseled, followed by a finishing pass), and another 26% using minimum or vertical tillage (one-pass with soil disturbance up to depth of four inches). Those in retail or consulting roles reported similar values, though survey participants in the agronomy retail sales/application category estimated a higher number of corn acres planted using conventional tillage. Strip-tillage represented only 3-6% of corn acres in Ohio (Figure 4).

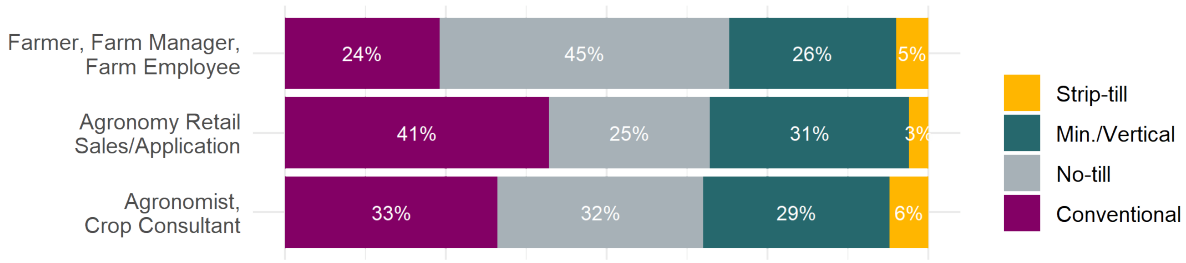

***Figure 4**. Percentage of corn acres planted by tillage practice.*

The two most popular genetic packages in corn were aboveground and belowground insect protection, respectively. The least reported genetic package was for drought stress (Figure 5).

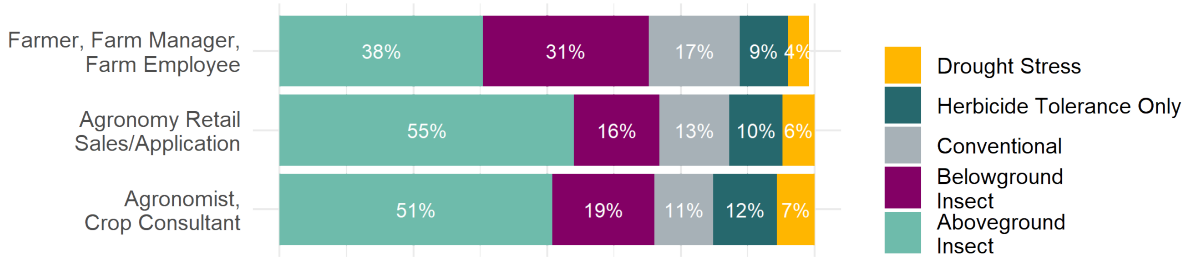

***Figure 5**. Percentage of corn acres planted by genetic package. Due to rounding, rows may not total 100%.*

Growers were asked to select all attachments or options used on their corn planter. More than half of participants use no-till coulters, after market closing wheels, 2x2 fertilizer, or row cleaners (Figure 6).

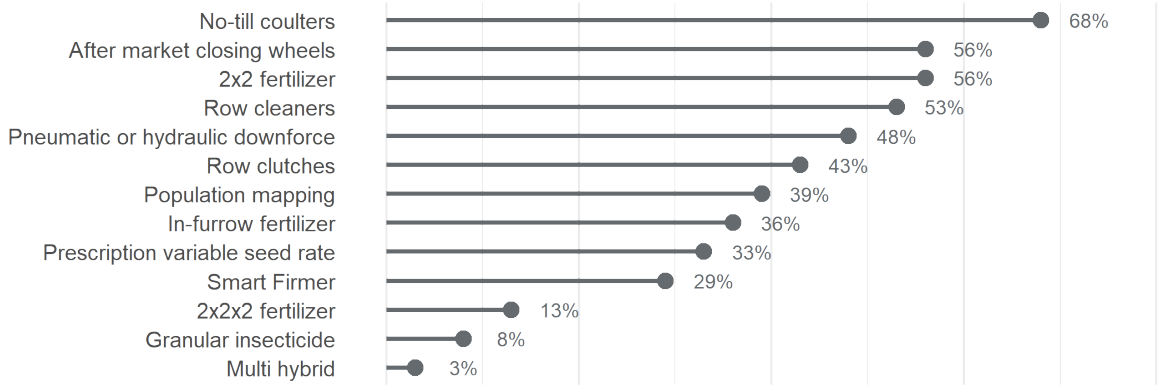

***Figure 6**. Farmer use of corn planter attachments and/or options (multiple responses allowed).*

The remaining questions focused on nitrogen source, rate, and timing. Respondents indicated that 28% or 32% urea ammonium nitrate (UAN) was the most common primary source of nitrogen in Ohio (Figure 7).

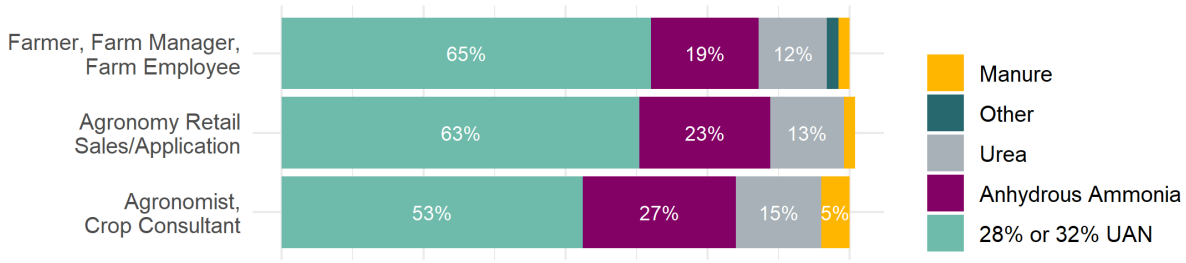

Figure 7. *Percentage of corn acres planted by primary nitrogen source. Due to rounding, rows may not total 100%.*

Growers were then asked to select all methods they use to set nitrogen rates (Figure 8) and apply nitrogen (Figure 9) on corn acres. More than half of respondents utilize yield goal based and/or maximum return to nitrogen (MRTN) methods to determine nitrogen rate. Only 6% based rates on both pre-sidedress nitrate test (PSNT) or crop sensor or tissue sampling.

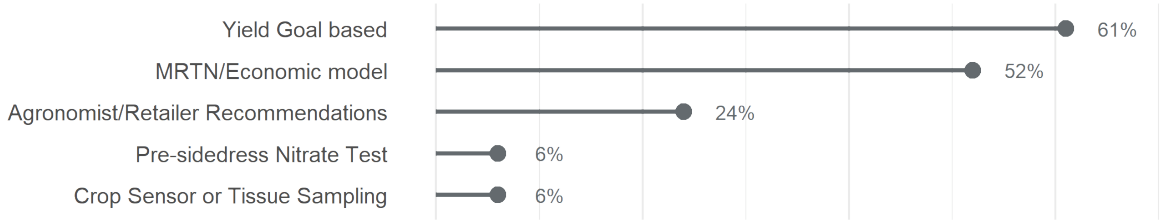

Figure 8. *Method(s) used by growers to set nitrogen rates for corn acres (multiple responses allowed).*

A sidedress (up to V6) or at-planting nitrogen application were the two main application windows selected.

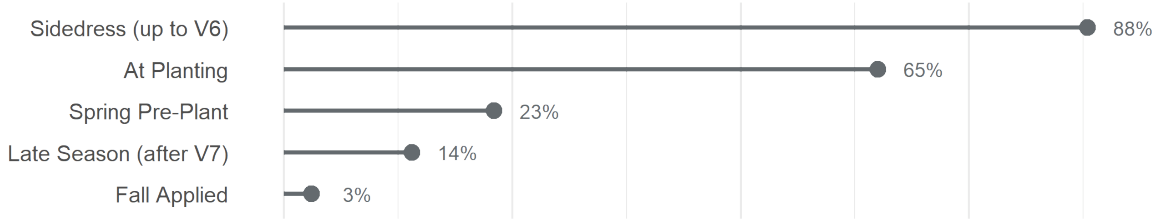

Figure 9. *Method(s) used by growers to apply nitrogen for corn acres (multiple responses allowed).*

SOYBEAN PRODUCTION

Soybean acreage was distributed similarly to corn, as approximately one third of growers intended to plant less than 200, 201-500, and 501-2,000 acres each, with the minority planting more than 2,000 acres of soybean in 2022 (Figure 10). The distribution of soybean acres serviced by either agronomists or retailers was also comparable to corn (Figure 11).

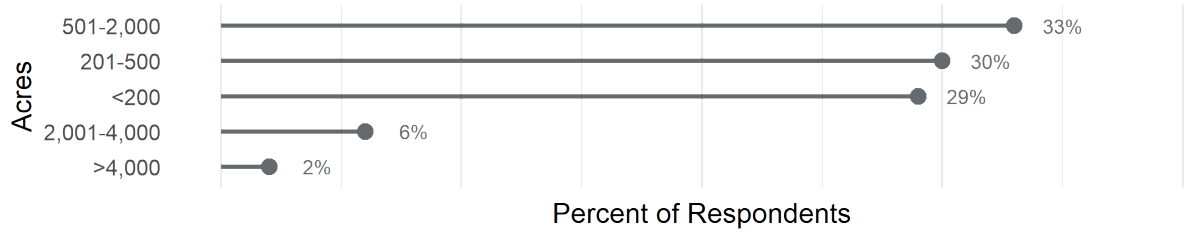

Figure 10. *Number of soybean acres farmers, farm managers, and farm employees intended to plant in 2022.*

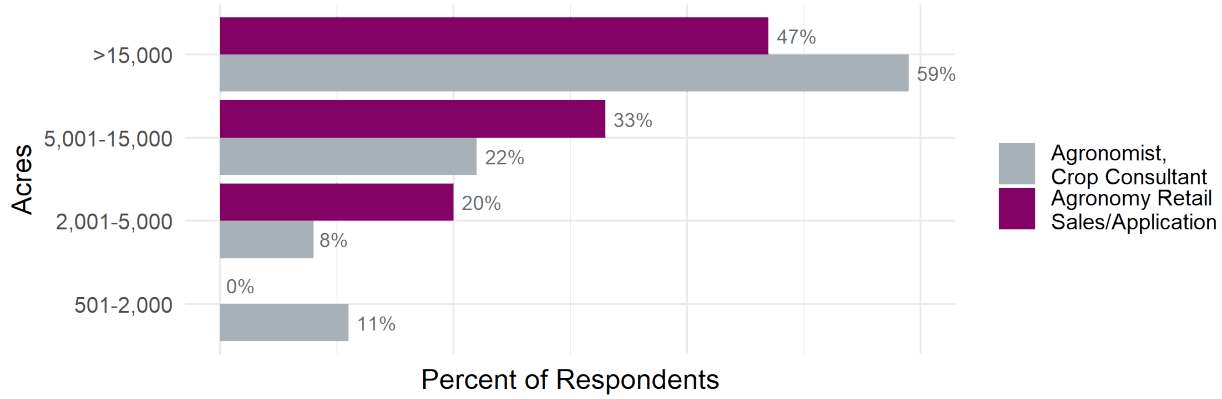

Figure 11. *Approximate number of soybean acres serviced.*

In 2022, the predominant row spacing for soybean was 15-19 inches, representing 55% of reported acreage. The second most common row spacing was 8 inches or less (29%). Over half (58%) of acres had an average seeding rate between 130,001 and 160,000 seeds per acre. Respondents reported 13% and 27% of soybean acres planted with a seeding rate of 100,001-130,000 and 160,001-190,000 seeds per acre, respectively. 58% of growers used a planter as the primary option to seed soybeans, while 28% reported using a box drill and 14% an air seeder.

Conservation tillage or no-till systems were more common for soybean than corn. There was an average of 55-69% soybean acres in no-till among the three occupation categories. Meanwhile, conventional tillage only represented 10-17% of soybean acres in 2022 (Figure 12).

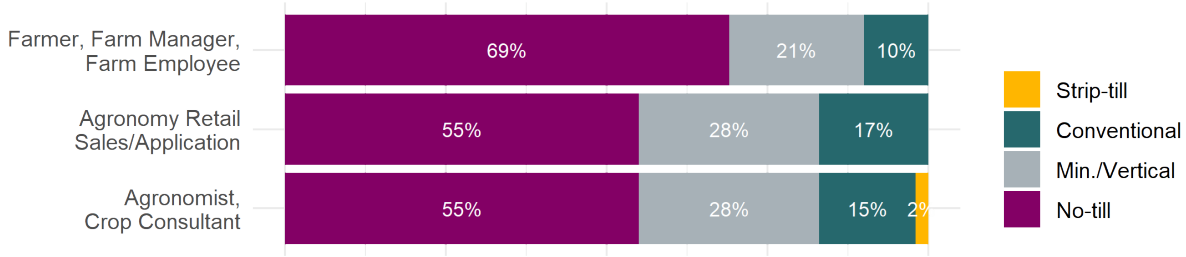

Figure 12. *Percentage of soybean acres planted by tillage practice.*

Overwhelmingly, the most common genetic package for soybean was Enlist E3 (49-70%). The XtendFlex platform was the second most reported (11-19%). Older trait packages and non-GMO varieties were in the minority of soybean acres in 2022.

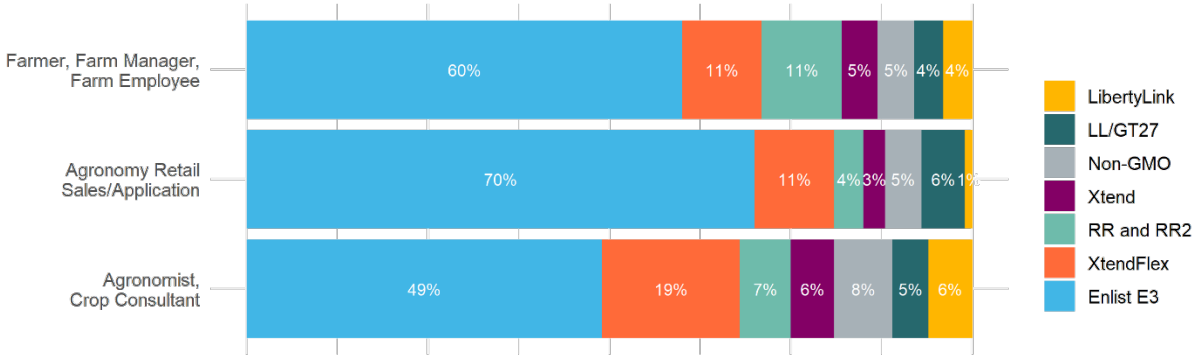

Figure 13. *Percentage of soybean acres planted by genetic package. Due to rounding, rows may not total 100%.*

Growers were asked what method(s) they planned to use for herbicide applications on their soybean acres in 2022. Almost all anticipated making a post application; 59% planned a spring burndown with pre-emergent; and 49% a burndown with a pre-emergent at planting. Only 15% of farmers, farm managers, and farm employees included a fall burndown in their herbicide program.

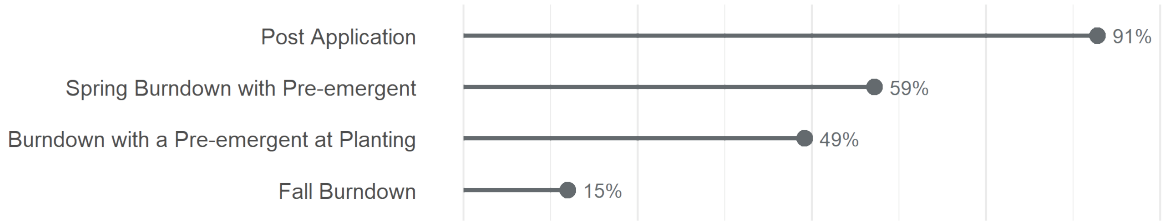

Figure 14. *Growers' methods for herbicide applications on soybean acres in 2022 (multiple responses allowed).*

A greater proportion of growers use fungicides prophylactically compared to insecticides. Respondents were more likely to base insecticide use on scouting or never use insecticide at all. No farmers, farm managers, or farm employees selected the option that fungicide and/or insecticide was applied when soybean price was greater than $11 per bushel.

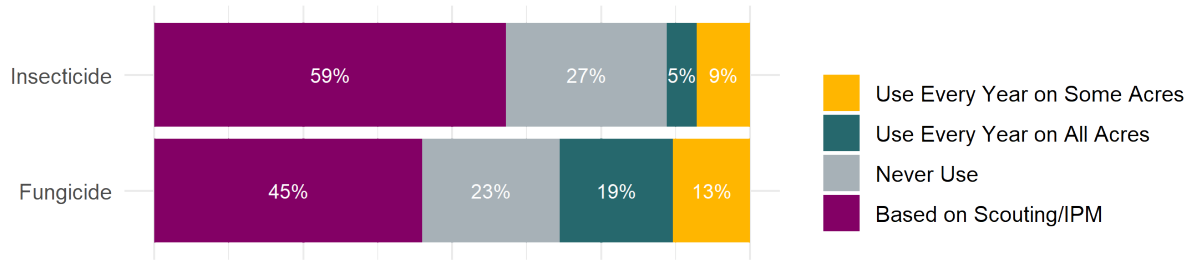

Figure 15. *Percentage of respondents by primary use of insecticide and fungicide on soybean acres.*

WHEAT PRODUCTION

Out of the 266 Ohio farmers, farm manager, or farm employees that participated in the survey, 150 planted wheat in the fall of 2021. The majority planted 200 or less acres, and another 22% planted 201-500 acres (Figure 16). Crop consultants advising wheat acres in 2021-2022 represented 85% of all respondents in that occupation category, while 95% of retailers and applicators serviced wheat acres. Most sales and agronomic support roles advised 501-2,000 wheat acres (Figure 17).

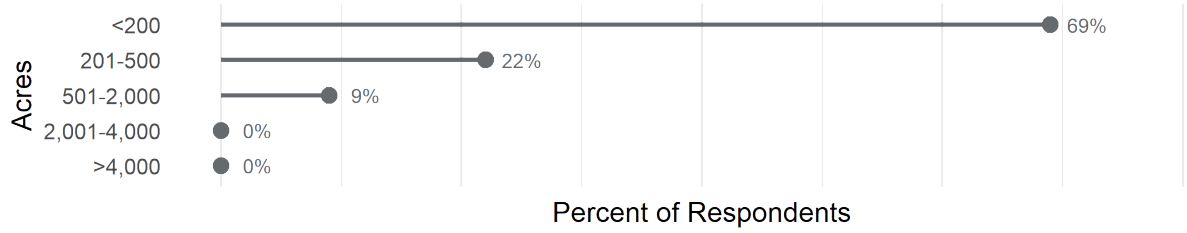

Figure 16. *Number of wheat acres farmers, farm managers, and farm employees intended to plant in 2022.*

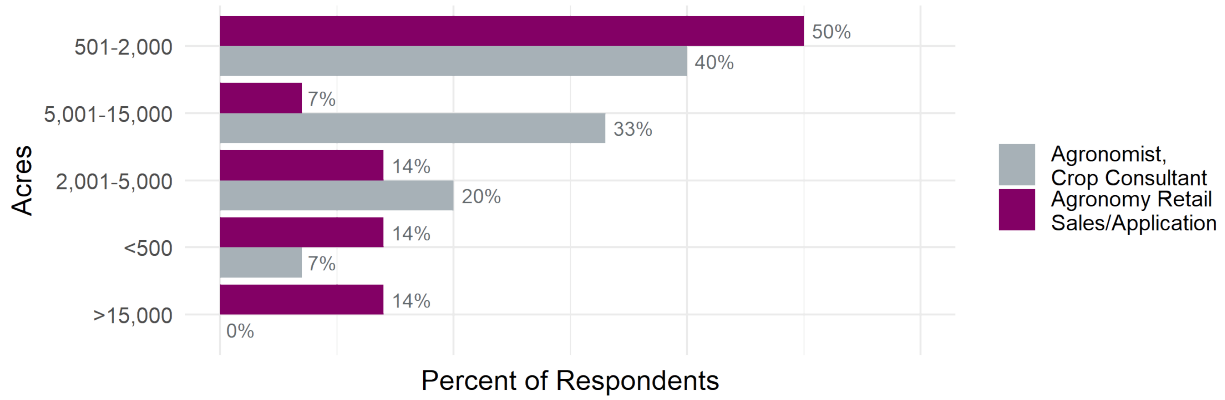

Figure 17. *Approximate number of wheat acres serviced.*

In 2021-22, 78% of reported wheat acreage was in no-till; 18% planted using minimum and/or vertical tillage; and 5% in conventional tillage. Grain was the intended purpose of all acres. About one third of wheat growers each planned to bale straw for personal use (33%); sell in-

field (35%); or chop and leave as residue (33%). Most growers purchased certified wheat seed, and the remaining 8% used seed from the previous harvest. The predominant row spacing for wheat was 8 inches or less (Figure 18).

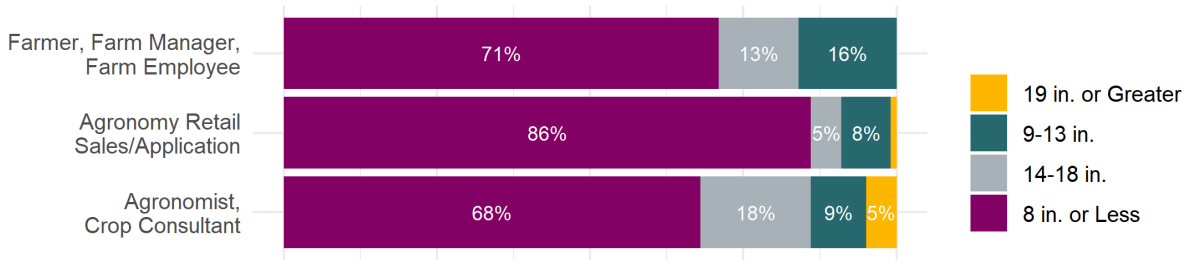

Figure 18. *Percentage of respondents by predominant row spacing for wheat.*

Average seeding rate varied, with 1.5-1.75 million seeds per acre representing 35% of wheat acres. Another 34% was planted with an average seeding rate of 1.25-1.5 million seeds per acre (Figure 19).

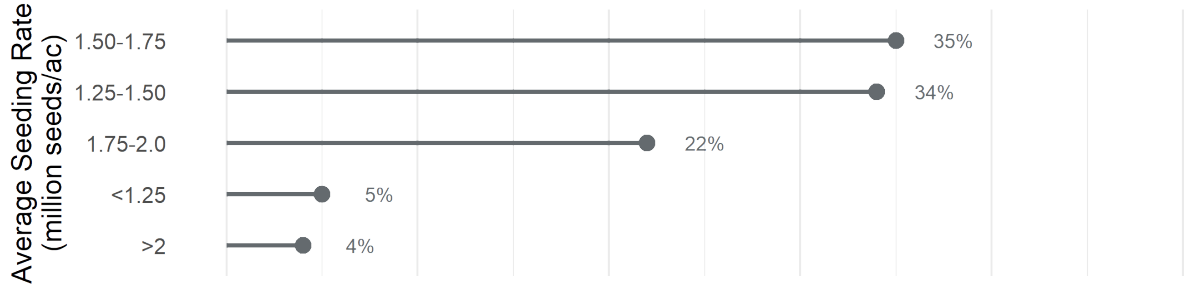

Figure 19. *Growers' average seeding rate for wheat.*

Compared to corn and soybean, a greater proportion of growers apply fungicide every year on all wheat acres, regardless of disease presence or wheat price. Of the 109 wheat growers that responded to the question of how fungicide is used on their wheat acres, 50% use it every year on all acres; 30% based on scouting or forecasting tools; 14% never use fungicide; 6% every year on some acres; and 1% only use fungicide when wheat price is over $5.75 per bushel.

The primary nitrogen source for 79% of wheat growers was 28% or 32% urea ammonium nitrate (UAN). Another 16% primarily use urea and 3% use manure sources. Only 2% use another primary nitrogen source not listed in the survey options (compost, legume cover crop, etc.). Growers were asked when they applied to their wheat acres (multiple responses allowed). Over three quarters make a spring top dress application, while just over half include a fall starter in their nitrogen program (Figure 20).

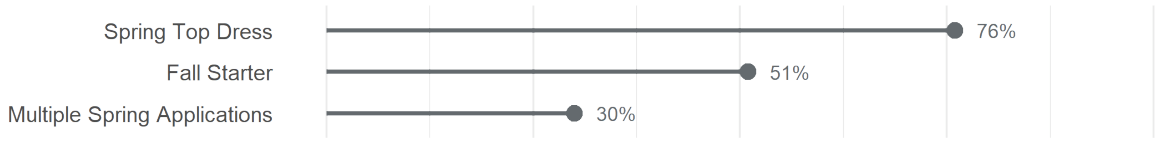

Figure 20. *Nitrogen application timing in wheat (multiple responses allowed).*

HAY/FORAGE PRODUCTION

One third of the growers surveyed managed hay or forage crops in 2022. Of these producers, 82% managed less than 200 acres of hay and/or forages and 12% managed 201-500 acres. The remaining 5% managed 501-2,000 acres. More than 80% of agronomists, crop consultants, applicators, and retailers serviced less than 2,000 acres of hay or forage crops.

42% of producers grow hay or forage crops primarily for sale, 28% for personal use; and 30% for both personal use and for sale. Over three-quarters of growers primarily purchase named varieties to establish their hay or forage crops, while 21% purchase common seed or variety not stated (VNS). Most producers prefer to establish hay or forage seedlings in the late summer or fall (70%) and 30% prefer spring establishment.

The three most common types of hay or forages grown in Ohio in 2022 were grass hay, mixed legume and grass hay, and alfalfa (Figure 21).

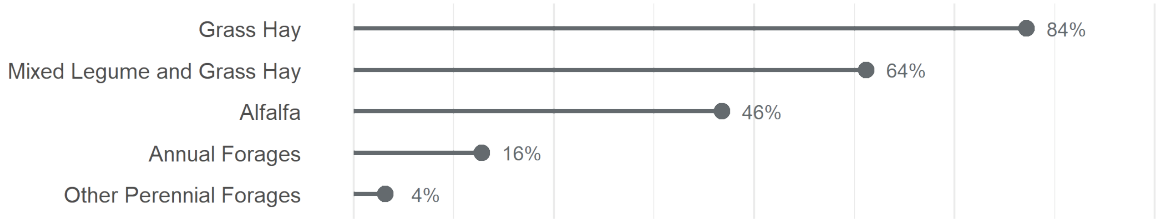

Figure 21. *Types of hay or forage crops grown (multiple responses allowed).*

Farmers, farm managers, and farm employees were asked which harvest method(s) they employ. Nearly 90% make dry hay and less than a third wet wrap or make silage (Figure 22).

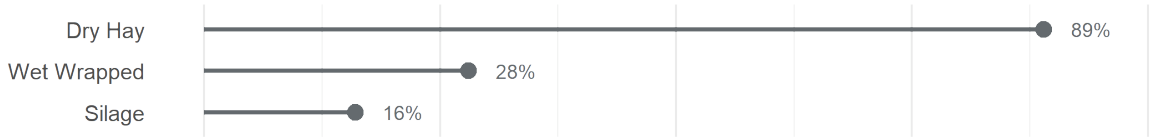

Figure 22. *Harvest methods for hay or forage crops (multiple responses allowed).*

The two predominant types of dry hay bales made were small squares and rounds (Figure 23).

Figure 23. *Types of dry hay bales made (multiple responses allowed).*

About half of growers selected that they store their silage upright, bagged, or in a bunker (Figure 24).

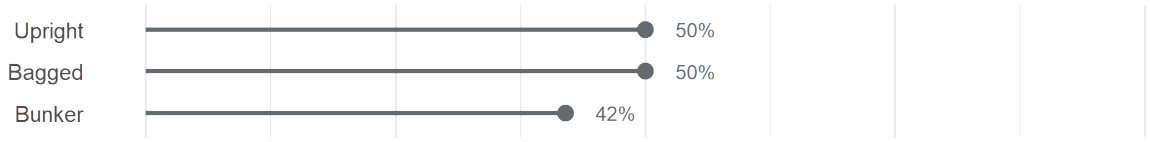

Figure 24. *Silage storage methods (multiple responses allowed).*

COVER CROP MANAGEMENT

Just under half of the farmers, farm managers, and farm employees participating in the survey planted either corn or soybean acres following a cover crop in 2022 (Figure 25). 30% of growers had grown cover crops for ten or more years; 38% had grown them for 5-9 years; 29% had grown them for 2-4 years; and the remaining 3% grew them for the first time in 2021.

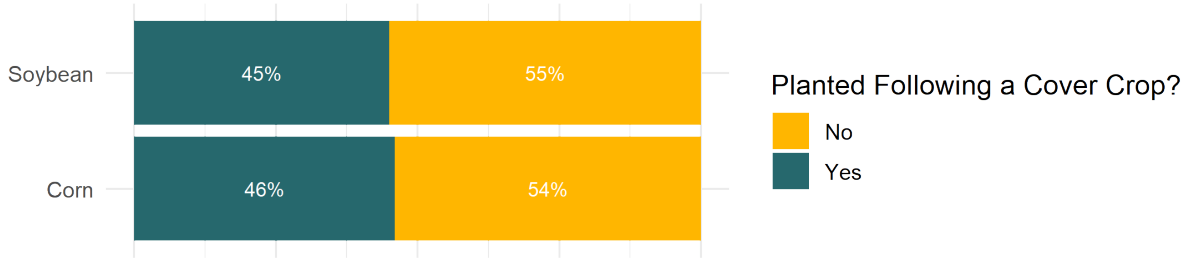

Figure 25. *Number of soybean and corn acres planted following a cover crop.*

A higher proportion of cover crop usage was seen in the acres serviced by agronomists, crop consultants, and agronomy retailers/applicators (Figure 26).

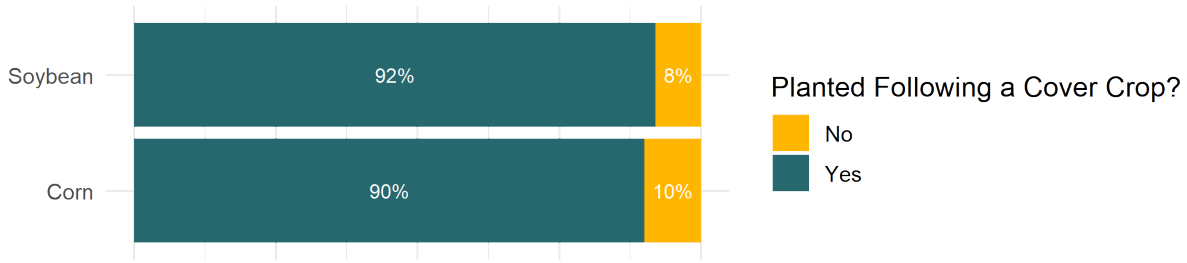

Figure 26. *Number of agronomists, crop consultants, and agronomy retailers/applicators that advise any corn or soybean acres that were planted following a cover crop.*

Overwhelmingly, the most common cover crop species grown was cereal rye, followed by radishes, oats, clover, and wheat (Figure 27).

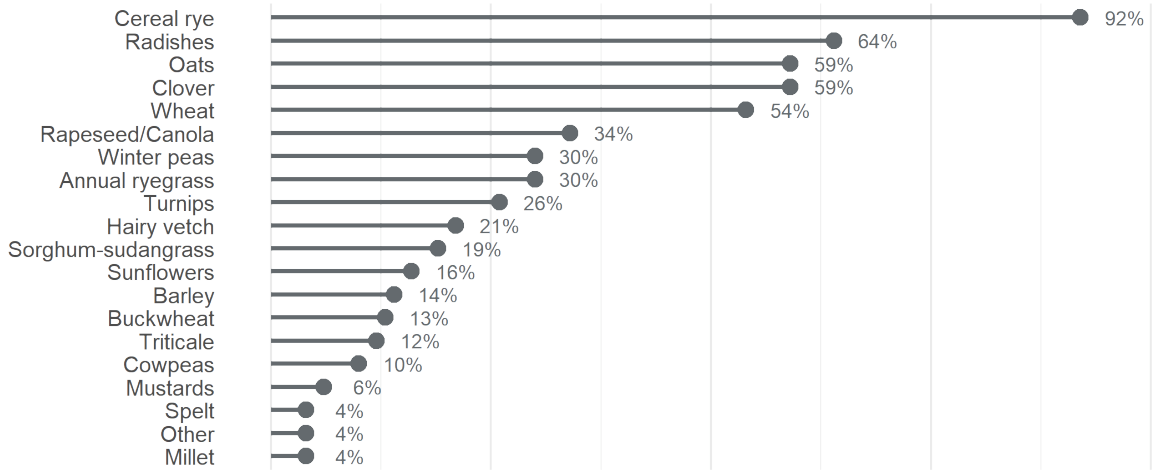

Figure 27. *Cover crop species grown by respondents (multiple responses allowed).*

57% of growers preferred to establish cereal rye covers with a drill or air seeder (narrow spacing, 10 inches or less), while 32% preferred to broadcast and incorporate. Only 9% selected aerial application as their preferred establishment method, and the remaining 3% of respondents preferred using a planter (row units spaced 10 inches or more). 32% of those growing cover crops had interseeded into a cash crop either in 2021 or prior to. Another 43% are considering interseeding in the future, and 24% have never interseeded a cover crop into a cash crop and do not plan to. For cover crop termination, 52% and 40% of growers prefer applying an herbicide before or at/after planting, respectively. Another 4% prefer using a roller/crimper to terminate their cover crop and the remaining respondents rely on tillage or plant winter killed cover crop species.

Growers were asked what resources they used to determine seeding rates, planting depths, or planting dates for cover crops. Survey participants seek management recommendations from a variety of sources, including peers, retailers, and public agencies (Figure 28).

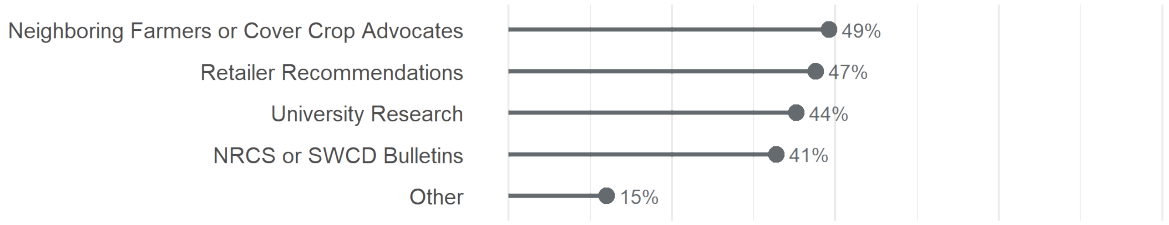

Figure 28. *Cover crop management resources used by respondents (multiple responses allowed).*

Soil health is the primary reason 68% of farmers grow cover crops. Retailers and consultants, however, attribute customers' cover crop adoption to not only soil health, but also to prevent soil erosion and capture funding from government or conservation programs (Figure 29). No respondents selected carbon storage as their primary reason for growing cover crops.

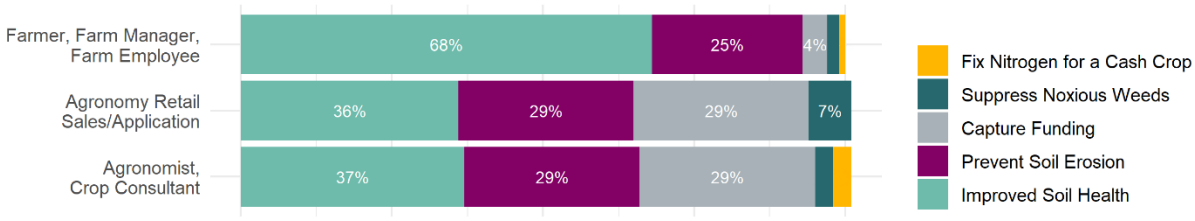

Figure 29. *Primary reason for planting cover crops. Due to rounding, rows may not total 100%.*

PRECISION AGRICULTURE ADOPTION

Survey participants were asked what precision agricultural technologies they had adopted on their farm. Over half of growers have implemented as-applied mapping, variable rate technology, section control, auto steer, and yield monitors (Figure 30).

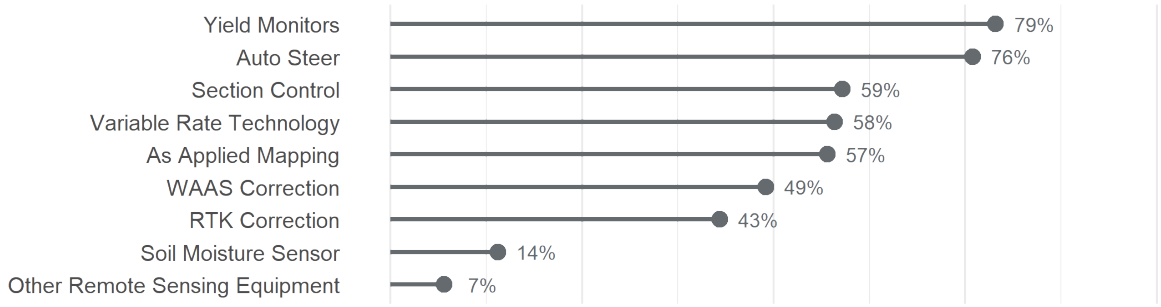

Figure 30. *Precision ag technologies adopted by respondents (multiple responses allowed).*

FUTURE CHALLENGES & OPPORTUNITIES FOR AGRONOMIC PRODUCTION

Of the 398 responses from Ohio, 64 selected education/agency or other agribusiness as their primary occupation. They were asked to rank what they saw as the biggest challenges

agronomic crop production over the next five years, and the biggest opportunities for agronomic crop production over the next five years. About three quarters of respondents worked directly with farmers, with the majority meeting with farmers a few times a month, or more (Figure 31).

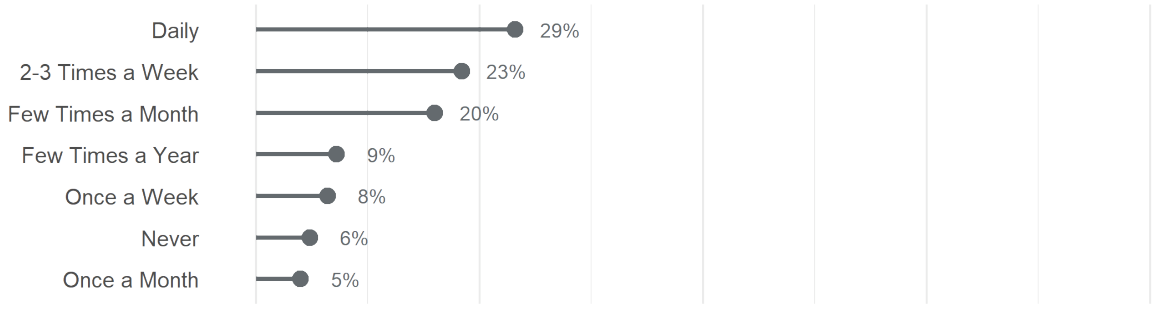

Figure 31. *Frequency of respondents' meetings with cash grain farmers.*

The following are the biggest challenges facing agronomic crop production over the next five years as ranked by respondents from the biggest (1) challenge to the smallest (9) challenge:

1. Farm stress
2. Barriers to entry for new producers
3. Lack of alternative crops or diverse markets
4. Loss of farmland to development
5. Increased regulations to improve water quality or conservation efforts
6. Lack of skilled labor
7. Pesticide resistance
8. Climate change
9. Decreasing margins/high investment costs accelerating the pace of farm consolidation

The following are the biggest opportunities facing agronomic crop production over the next five years as ranked by respondents from the biggest (1) opportunity to the smallest (6) opportunity:

1. Carbon markets
2. Self-driving equipment
3. Small autonomous equipment
4. Market bonuses based on production practices
5. Big Data tailoring recommendations for soil types/geographic areas
6. New weed control strategies