SUMMARY
This report is a summary of performance data collected from forage variety trials in Ohio during 2018, including commercial varieties of alfalfa, annual ryegrass and cover crops in tests planted in 2015 to 2018 across three sites in Ohio: South Charleston, Wooster, and North Baltimore. For more details on forage species and management, see the Ohio Agronomy Guide, Ohio State University Extension Bulletin 472, which can be purchased from Ohio State University Extension's eStore at http://estore.osu-extension.org/.

Interpreting Yield Data
Yield data are reported in Tables 2 through 7. Details of establishment and management of each test are listed in footnotes below Tables 3 to 7. Least significant differences (LSD) are listed at the bottom of data columns in Tables 3 through 7. Differences between varieties are significant only if they are equal to or greater than the LSD value. If a given variety yields more than another variety by as much or more than the LSD value, then we are 95% sure that the yield difference is real, with only a 5% probability that the difference is due to chance alone. For example, if variety X is 0.50 ton/acre higher in yield than variety Y, then this difference is statistically significant if the LSD is 0.50 or less.

The CV value or coefficient of variation, listed at the bottom of each table is used as a measure of the precision of the experiment. Lower CV values will generally relate to lower experimental error in the trial. Uncontrollable or unmeasured variations in soil fertility, soil drainage, and other environmental factors contribute to greater experimental error and higher CV values. However, higher CV values can also occur simply as a result of the mean yield being low (eg. due to weather conditions), because the CV is a function of the mean yield. So a higher CV will often occur where yields are low despite there being no increase in experimental error.

Results reported here should be representative of what might occur throughout the state but would be most applicable under environmental and management conditions similar to those of the tests. The relative yields of all forage legume varieties are affected by crop management and by environmental factors including soil type, winter conditions, soil moisture conditions, diseases, and insects.

ALFALFA
Alfalfa has the highest combined yield and quality potential of any adapted perennial forage grown in Ohio. It is grown on about 310,000 acres. Alfalfa requires well-drained soils with near-neutral pH (6.5-7.0). Alfalfa trials are initiated each year and data is collected for at least four years unless the stand becomes so depleted that further testing is no longer worthwhile; variety performance should be evaluated over several sites and years.
Guidelines for Selecting Alfalfa Varieties
To capitalize on alfalfa's potential, select high-yielding varieties with resistance to major diseases. Alfalfa variety rankings for a number of traits described below are reported on the National Alfalfa & Forage Alliance webpage at https://www.alfalfa.org/. Click on the “Education” tab along the top of the page. Consider these factors when selecting alfalfa varieties for Ohio:

1. **Yield.** Yield is critical to profitability of an alfalfa stand. Select varieties with high yields over several locations and years. Table 2 shows this comparison in percent of the average test yield. Varieties that perform equally well across several locations and years are adapted to a wider range of environmental conditions, which is important because soils may vary on your farm and weather conditions vary from year to year.

2. **Persistence.** Another important consideration is how long the alfalfa stand will last. Study variety performance by age of stand to get an estimate of longevity of productivity. Some varieties may decline with age more rapidly than others, which may influence your variety choice depending on how long you intend to keep the stand. For long-term rotations, choose varieties with good disease resistance and good performance in the fourth year. If you plan to harvest alfalfa for three years or less, then high performance during the first three years should be given priority.

3. **Fall dormancy (FD).** Alfalfa varieties with fall dormancy ratings of 1 through 5 are considered adequately winter hardy for Ohio conditions while those of 6 or higher are not considered adapted. Varieties with higher fall dormancy ratings tend to grow at a lower temperature, so they begin growth earlier in the spring and continue growth later into the fall. The fall dormancy rating does not correlate well with winter hardiness within the range of varieties adapted to the Midwest USA.

4. **Disease resistance.** Variety selection based on yield performance alone is less satisfactory than selections that also consider disease resistance characteristics. Resistance to specific disease-causing pathogens may be the most important attribute in an alfalfa variety. Pathogens can dramatically reduce yield and persistence of susceptible varieties. In an evaluation of older versus newer alfalfa varieties we found that newer varieties yielded more and persisted longer than older varieties, primarily because of improved resistance to diseases. For more information on alfalfa diseases, go to http://oardc.osu.edu/ohiofieldcropdisease/t01_pageview2/Home.htm.

5. **Insect resistance.** Alfalfa varieties have been developed for resistance to potato leafhopper (PLH), which is the most consistently damaging insect pest of alfalfa in Ohio. The PLH resistant varieties are not resistant to the alfalfa weevil, and they will need to be protected from that pest like all standard alfalfa varieties when weevil populations exceed the economic action threshold. For more information on these two important pests of alfalfa, see http://ohioline.osu.edu/factsheet/ENT-32 and http://ohioline.osu.edu/factsheet/ENT-33.

6. **Compare to check variety.** For comparisons of varieties across several trials, always compare varieties to the same check variety planted within the trial. The variety Vernal is used as a check in all Ohio trials and is commonly included in trials in other states. Another good way to compare varieties across trials is to look at their yield in relation to the trial average reported in Table 2.

7. **Use good management.** No variety can produce well under poor management. Good management considers all aspects of alfalfa production: seed bed preparation, liming and fertilization, seeding, pest control, harvest, storage, and post-harvest treatment. Many newer varieties are better adapted to intensive management.
Summary of 2018 Crop Conditions

Rainfall was quite variable across the three locations with North Baltimore ending up normal for the summer and above normal at South Charleston and Wooster. Average monthly temperatures were above normal for most of the year except in April and August.

Table 1:
Weather 2018

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<th>Total</th>
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*DFA = departure from long-term average

Alfalfa

The 2017 seeding at South Charleston had the highest yields in 2018, averaging 7.68 tons/acre followed by the 2016 seeding at Wooster, at 6.49 tons/acre. A new spring seeding at S. Charleston was seeded on 1-May. Weather and weeds slowed growth of the trial therefore data was not collected in 2018. Insecticide applications were applied at all locations for control of potato leafhopper (PLH) and to control alfalfa weevil at South Charleston and North Baltimore in the spring.
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<th>Avg all</th>
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| Trial Mean    | 6.18   | 5.42   | 5.33   | -- | -- |
| No. site years| 3      | 3      | 2      | -- | -- |
### Table 3:
Alfalfa Variety Trial
Ohio, North Baltimore, Sown 8-27-15

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**Note only three harvest were taken at North Baltimore in 2017 due to weather.**

**Trial was fall seeded after spring planting failed**

Establishment: Seeded with a Hege 3-point hitch drill with presswheels at 16 lb/a.

Plot size: 4' x 20', 15' alleys and borders, RCBD with four reps.

Soil type / analysis: Holtville silt loam, pH=6.5, P=88 lbs/a, K=286 lbs/a, CEC=17, O.M.=2.8, (11/16).

2018 Pest control: Insecticide was applied 20-May for alfalfa weevil, 23-July, 20-August for potato leafhoppers.
### Table 4:

#### Alfalfa Variety Trial

**Ohio, Wooster, Sown 4-25-2016**

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Establishment: Seeded with a Hege 3-point hitch drill with presswheels at 16 lb/a.

Plot size: 4' x 20', 15' alleys and borders, RCBD with four reps.

Soil type / analysis: Riddles silt loam, pH = 6.6, P = 90 lb/a, K = 200 lb/a, CEC = 7.2 (11/16).

2018 Fertility: Applied 825 lb/acre of 0-18-36

2018 Pest control: Insecticide was applied 8-June, 13-July and 20-August for potato leafhopper control.
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**Note:** After seeding in great soil conditions, the weather turned with three weeks of well below normal temperatures and above average rainfall that affected stands.

Soil type / analysis: Crosby silt loam, pH=7.0, P=110 lbs/a, K= 344 lbs/a, CEC=13, O.M.=1.4, (04/17).

2018 Pest control: Insecticide was applied on 18-June, 11-July, 13-August for potato leafhopper control.
Annual Ryegrass

An annual ryegrass trial was planted in September 2017. There was winter injury that varied among varieties. Forage yields in 2017-18 were near the long-term average at this location. Annual ryegrass is a cool-season annual bunchgrass that is highly palatable and digestible. It has high seedling vigor.

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Means followed by same letter or symbol do not significantly differ (P=.05, LSD)
Mean comparisons performed only when AOV Treatment P(F) is significant at mean.

* Variety tested using experimental seed that may not give performance identical to that of commercially available seed.

Soil type / analysis: Crosby silt loam, pH=7.2, P=100 lbs/a, K=230lbs/a, CEC=10.5, O.M.=1.9,(10/16).
Fertilization: 2017 Applied 100 lb/a of 46-0-0 on 13 - October.
Fertilization: 2018 Applied 100 lb/a of 46-0-0 on 26-March and 80lb/a on 14-May.
A cover crop variety trial was planted on September 12, 2017 at the South Charleston location to evaluate different cover crop species and varieties for stand and ground cover development throughout the fall and for stand, ground cover, and final biomass production the following spring.

The conditions for this trial are not meant to be representative of cover crop planting following soybeans or corn in Ohio, because it was planted in a well-prepared seedbed (conventionally tilled) in early September well before soybean or corn harvest timing in Ohio.

This trial more closely represents what would be possible with cover crops planted on land that was in winter wheat and laid fallow after the July grain harvest, although even in that situation no-till planting of the cover crops in September would be preferable for conservation purposes. Therefore, the results from this trial should be interpreted and applied with caution. The results do demonstrate the relative speed of fall ground cover establishment of different varieties planted in early September, and which ones survive the winter and grow in the spring (thus needing to be terminated before grain crop planting).

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Means followed by same letter or symbol do not significantly differ (P<.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant.
ADDRESS OF MARKETERS

Barenbrug USA
P.O. Box 239
Tangent, OR
www.barusa.com

Beck’s Hybrids
6767 East 276th St.
Atlanta, IN 46031
www.beckshybrids.com

Blue River Hybrids
27087 Tiber Rd.
Kelly, IA 50134
www.blueriverorgseed.com

Byron Seeds
775 N. 350 E.
Rockville, IN 47872
www.byronseeds.com

Croplan Genetics
See Local Retailer
www.nutrien.com

DLF - Pickseed Seeds
175 W. H Street
Halsey, OR 97348
www.dlfis.com

Doeblers PA Hybrids
202 Tiadaghton Ave.
Jersey Shore, PA 17740
www.doeblers.com

Farm Science Genetics
9311 Highway 45
Nampa, ID 83686
www.farmsciencegenetics.com

Oregon Seed Inc.
33080 Red Bridge Rd.
Albany, OR 97322
www.oregroseeds.com

Pioneer Hi-Bred Int’l
See Local Retailer
www.pioneer.com

Preffered Alfalfa Genetics
563-380-2338

Preferred Seed Company
575 Kennedy Rd.
Buffalo, NY 14227
www.preferredseed.com

Smith Seed Service
P.O. Box 288
Halsey, OR 97348
www.smithseed.com

S & W Seed Company
7108 N. Fresno St.
Fresno, CA 93720
www.swseedco.com

W–L Research
P.O. Box 1610
Ozark, MO 67521
www.wlalfalfas.com