

Executive Summary of Annual Report: New Variety Development and Testing of Small Grains in Maryland for Higher Yield and Disease Resistance

MGPUB Grant Proposal Number 2017332

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Angus Murphy – Professor and Chair

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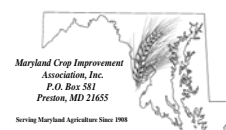
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- Commercialized four lines with high yield potential and excellent scab resistance to Limagrain Cereal Seeds, they are 15MW134, 15MW64134, 15MW315, 15 MDX19. These lines are on an accelerated release schedule.
- Increased 3 elite wheat breeding lines for final testing
- Collaborated with breeders in three uniform wheat nursery trials and two uniform barley nursery trials, planting 529 total plots for evaluation of new germplasm under Maryland's conditions during 2016-17.
- For 2017-18, planted headrows for initial field phenotype observation the following quantities: 80 of wheat, 150 of barley, and 100 of triticale.
- Performed an inoculated and misted scab nursery to measure the fusarium resistance of all 57 wheat lines in the statewide variety trials.
- Performed statewide evaluation using for 57 commercial wheat lines in a total number of 1,026 plots at six locations within Maryland. Selection of the highest-yielding varieties versus average performers resulted in a yield gain of 7.7 bu/A. The top yielder had an average statewide yield of 82.4 bu/A, while the lowest yielding variety averaged 68.2 bu/A.
- For 2017-18, planted State Trial of 66 wheat lines and 8 barley lines for a total of 1,236 plots. Data collected includes yield, test weight, maturity, height, & lodging.



COLLEGE OF
AGRICULTURE &
NATURAL RESOURCES

DEPARTMENT OF PLANT SCIENCE
AND LANDSCAPE ARCHITECTURE



Maryland Grain



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Overview

In preparation for the 2017 – 18 cropping year, Wight, Costa, Cooper and Murphy continued the advancement of wheat crosses made by Dr. Jose Costa. Investigators collaboratively planted with over 15 public breeding programs; participating in five regional breeding nursery field tests, published the results of the 2017 Maryland State Wheat and Barley Trials, and planted the Trials for 2016. To improve options available to producers, six elite wheat lines were licensed to Limagrain Cereal Seeds. Another line, “Luisa” was released as a public variety that producers can save for cover crop, or yield under higher input management systems. Further, to assist producers in choosing lines which will help them meet reduced wheat DON goals, the research group performed an inoculated scab nursery, which stress-tested all entries in the statewide trials for fusarium resistance.

Goals and Measurable Objectives

The Small Grains Breeding and Evaluation Program at the University of Maryland had four main objectives:

- 1) To produce impartial, statewide evaluation of the commercial and experimental lines of winter wheat and barley available to Maryland growers.
- 2) The collaborative misted Fusarium Head Blight Nursery between the Universities of Maryland and Delaware to evaluate new and current varieties of winter wheat and barley with increased disease resistance, high yield, and high quality for the mid-Atlantic Region.
- 3) To assist in the development of new varieties of winter wheat, grain barley, malting barley and triticale with increased disease resistance, high yield and high quality for Maryland.
- 4) To increase cool season small grains and cover crop planting options available to Maryland producers through new germplasm releases.

Objective 1) Statewide Variety Trials:

State trials grown across Maryland are an effective tool to compare the performance of new and current small grains varieties. Results from these trials provide growers with unbiased information for making decisions regarding their choice of variety, with a very broad number of entries from both private and public institutions.

Potential Economic Impact of Variety Selection Using Maryland’s State Trial Data:

There was a statewide overall **performance spread of 14.9 bu/A**, from a maximum of 82.4 to a minimum of 68.2 bu/A. Mean yield was 74.7 bu/A. A conservative estimate of the financial benefit to producers, which would be **selecting the highest yielding variety versus the average yield, would mean an average**

gain of 7.7 bu/A. This would result in **\$36.88 profit per acre with wheat at \$4.79/bu**. Given the 260,000 acres under wheat production in Maryland, this would translate to a statewide gain of \$9.6 million annually. This information was derived from data collected on 1,062 wheat and 42 barley plots planted across Maryland in the 2015-16 season.

The full information of the 57 lines tested in the State Variety Trials is posted online in the Agronomy Factsheet and was presented at the 2017 Maryland Commodity Classic.

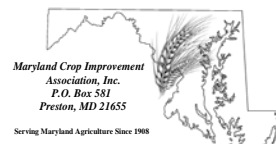
<https://psla.umd.edu/extension/extension-project-pages/small-grains-maryland>

Two & Three Year Yield Average: Total Percent Yield

Brand	Entry	3-Year Yield % Avg.	2-Year Yield % Avg.	2014-15 Yield % Mean	2015-16 Yield % Mean	2016-17 Yield % Mean
UniSouth Genetics	USG 3895	107.3	104.5	113.0	108.1	100.9
CROPLAN	SS 8415	104.2	105.1	102.5	106.7	103.5
Virginia Tech University	Hilliard	103.9	102.8	106.0	104.8	100.9
UniSouth Genetics	USG 3201	102.6	103.9	100.1	104.4	103.4
Growmark FS	FS 860	101.7	100.7	103.8	103.7	97.7
Syngenta	SY 547	101.4	99.4	105.2	99.7	99.2
Dyna-Gro	DG SHIRLEY	101.4	100.8	102.5	102.1	99.5
UniSouth Genetics	USG 3404	100.3	98.7	103.5	99.9	97.5
Eddie Mercer Agriservices	MBX 14-S-210	99.1	98.6	100.2	97.9	99.4
Mid-Atlantic Seeds	MAS#7	98.6	99.7	96.3	97.8	101.6
Mid-Atlantic Seeds	MAS#6	96.5	94.8	100.1	93.1	96.4
Syngenta	SY 007	95.7	99.9	87.3	101.6	98.3
University of Maryland	15MW133	95.4	98.2	89.7	100.6	95.8
Growmark FS	FSX 871		99.9		98.4	101.4
Growmark FS	FSX 872		105.5		108.6	102.4
Mid-Atlantic Seeds	MAS#67		99.3		102.2	96.5
Eddie Mercer Agriservices	MBX 16-B-203		99.4		96.4	102.5
Dupont Pioneer	P 25R25		103.8		108.1	99.5
Dupont Pioneer	P 25R40		105.1		103.8	106.4
Syngenta	SY VIPER		101.6		103.3	100.0
UniSouth Genetics	USG 3197		103.4		103.3	103.6
UniSouth Genetics	USG 3316		100.5		95.6	105.3

High variety turnover makes information sources like the State Trials **more important**. Of the 57 entries in the Wheat State Trials in 2016-2017, only 13 have longevity of three years or more.

There was a 15.6 bu/A yield difference in the 3-year average between highest and lowest-yielding varieties. **That's a variety-predicted difference of \$74.72 per acre, or \$224.17 per acre over three years.**



Maryland Grain



Table 2. Maryland State Wheat Trials 2015-16 Yield Summary Table.

2016-17 State Yield and Agronomic Characteristics

Brand	Entry	Yield % Mean	Statewide		Date Headed Julian	Height In	Lodging (0-5)	Powdery Mildew (0-9)
			Yield† bu/A	Test Wt† lbs/bu				
Mid-Atlantic Seeds	MAS#316	110.4	82.4	58.2	116	37	1	1
Mid-Atlantic Seeds	MAS#61	107.1	80.0	57.4	117	35	2	4
Dupont Pioneer	25R40	106.4	79.5	57.6	120	33	1	1
Dyna-Gro	9701	105.5	78.8	57.6	119	38	1	1
UniSouth Genetics	USG 3316	105.3	78.7	57.8	119	36	1	6
Armor Seed, LLC	Mayhem	105.3	78.6	57.9	119	37	1	1
Dyna-Gro	9772	105.2	78.6	57.0	119	38	2	6
CROPLAN	SRW9606	105.1	78.5	57.7	119	37	1	2
UniSouth Genetics	USG 3536	104.9	78.4	58.2	119	38	1	2
CROPLAN	SRW9415	104.9	78.4	58.0	119	35	1	6
Syngenta	SY 100	104.8	78.3	56.9	116	36	2	1
Mid-Atlantic Seeds	MAS#716	104.6	78.1	56.6	118	38	1	3
UniSouth Genetics	USG 3197	103.6	77.4	57.7	118	37	1	3
Mid-Atlantic Seeds	MAS#65	103.5	77.3	57.1	119	35	1	1
CROPLAN	SS8415	103.5	77.3	58.4	118	37	1	1
UniSouth Genetics	USG 3201	103.4	77.2	59.6	119	36	1	3
Eddie Mercer Agriservices	MBX 16-B-203	102.5	76.5	57.5	119	36	1	3
Growmark FS	FSX 872	102.4	76.5	57.3	117	35	1	2
Limagrain Cereal Seeds	L11550	102.2	76.3	59.1	120	35	1	2
Dyna-Gro	WX16722	102.1	76.3	57.7	118	34	2	2
Virginia Tech University	VA13W-38	102.0	76.2	59.3	117	35	1	1
UniSouth Genetics	USG 3458	101.8	76.1	57.1	118	34	1	3
Mid-Atlantic Seeds	MAS#42	101.7	76.0	57.9	120	38	1	4
Eddie Mercer Agriservices	MBX 17-M-245	101.7	76.0	56.7	117	34	1	1
Mid-Atlantic Seeds	MAS#7	101.6	75.9	57.6	119	36	1	4
Dyna-Gro	WX17782	101.5	75.8	59.1	119	36	1	1
Growmark FS	FSX 871	101.4	75.8	57.4	117	36	2	2
Mid-Atlantic Seeds	MAS#116	101.0	75.4	58.6	120	36	1	2
Virginia Tech University	HILLARD	100.9	75.4	59.3	117	37	1	1
UniSouth Genetics	USG 3895	100.9	75.4	57.2	119	34	1	2
Limagrain Cereal Seeds	LCS3204	100.8	75.3	60.2	118	40	1	1
Mid-Atlantic Seeds	MAS#35	100.8	75.3	57.4	120	34	1	1
University of Maryland	15MDX18	100.7	75.2	58.6	120	32	1	1
Armor Seed, LLC	ARW1610	100.3	75.0	58.1	119	35	1	1
UniSouth Genetics	USG 3228	100.3	74.9	57.2	117	33	1	2
Armor Seed, LLC	ARW1514	100.3	74.9	57.6	118	35	1	1
Syngenta	SY VIPER	100.0	74.7	59.0	117	37	1	2
UniSouth Genetics	USG 3549	99.6	74.4	58.6	119	39	2	5
Dupont Pioneer	25R25	99.5	74.4	57.8	120	36	1	2
Dyna-Gro	SHIRLEY	99.5	74.3	56.7	118	33	1	1
Eddie Mercer Agriservices	MBX 14-S-210	99.4	74.3	57.8	119	37	1	2
Syngenta	SY 547	99.2	74.1	58.2	120	34	1	1
Dyna-Gro	9750	98.9	73.9	57.7	117	33	1	3
Syngenta	SY 007	98.3	73.4	58.4	118	36	1	0
Eddie Mercer Agriservices	MBX 17-P-275	98.0	73.2	57.3	118	36	1	3
Growmark FS	FS 860	97.7	73.0	57.4	119	36	2	3
Virginia Tech University	VA12W-72	97.6	72.9	57.8	117	36	1	1
Virginia Tech University	VA12W-68	97.5	72.9	58.2	117	35	1	0
UniSouth Genetics	USG 3404	97.5	72.8	57.8	120	36	1	4
Syngenta	OAKES	96.7	72.3	59.2	119	38	1	4
Armor Seed, LLC	ARW1611	96.7	72.2	58.3	120	35	1	1
Mid-Atlantic Seeds	MAS#67	96.5	72.1	57.0	117	34	1	1
Mid-Atlantic Seeds	MAS#6	96.4	72.0	56.3	117	34	2	3
Mid-Atlantic Seeds	MAS 69	96.0	71.7	59.4	118	33	1	2
University of Maryland	15MW133	95.8	71.6	58.5	120	34	1	1
Armor Seed, LLC	ARW1575	95.7	71.5	58.5	118	36	1	7
University of Maryland	15MDX17	95.5	71.3	58.7	118	33	1	1
Limagrain Cereal Seeds	LCS4601	95.1	71.0	59.0	119	40	2	6
University of Maryland	15MDX4	95.0	71.0	59.0	119	32	1	2
University of Maryland	15MDX5	95.0	70.9	59.5	118	36	2	2
Virginia Tech University	VA11W-279	94.9	70.9	58.8	116	33	1	1
Mid-Atlantic Seeds	MAS#816	94.8	70.8	59.6	120	38	1	3
University of Maryland	15MDX11	93.0	69.5	58.9	118	36	1	0
Virginia Tech University	VA11W-108 PA	92.8	69.3	58.2	118	37	1	1
University of Maryland	15MDX2	92.7	69.3	59.9	118	37	1	3
University of Maryland	15MDX6	91.4	68.3	59.6	116	36	1	1
University of Maryland	15MDX1	91.3	68.2	58.6	120	38	2	1

Mean 74.7
CV 10.8
LSD.05 = 5.6

† All yields and test weights are reported at a 13.5% grain moisture content.

‡ Values followed by * are not significantly different from the leading entry.

There were 57 entries in the Wheat State Trials in 2016-2017. Locations are: Quantico, Wye, Clarksville, Beltsville, and Woodsboro. Seeding density is 22 seeds per foot of row on 6" rows. The experimental design is a randomized complete block with 3 replications. The tillage and fertility are conventional. Nitrogen applications vary between sites depending on previous crop (we generally follow a corn crop).

There was a statewide overall performance spread of 14.9 bu/A, from a maximum of 82.4 to a minimum of 68.2. Statewide variation for each variety was acceptably low, (as measured by the C.V.). Due to natural data variation, the average statewide performance of the top 16 entries are not significantly different from each other.

Leading Wheat for Straw & Grain

Brand	Entry	Height in	Yield % Mean	Statewide		Date Headed Julian	Lodging (0-5)	Powdery Mildew (0-9)
				Yield† bu/A	Test Wt† lbs/bu			
Limagrain Cereal Seeds	LCS3204	40	100.8	75.3	60.2	118	1	1
Limagrain Cereal Seeds	LCS4601	40	95.1	71.0	59.0	119	2	6
UniSouth Genetics	USG 3549	39	99.6	74.4	58.6	119	2	5
Dyna-Gro	9701	38	105.5	78.8	57.6	119	1	1
Dyna-Gro	9772	38	105.2	78.6	57.0	119	2	6
Mid-Atlantic Seeds	MAS#42	38	101.7	76.0	57.9	120	1	4
Mid-Atlantic Seeds	MAS#816	38	94.8	70.8	59.6	120	1	3
UniSouth Genetics	USG 3536	38	104.9	78.4	58.2	119	1	2
Mid-Atlantic Seeds	MAX 716	38	104.6	78.1	56.6	118	1	3
University of Maryland	15MDX1	38	91.3	68.2	58.6	120	2	1
Syngenta	OAKES	38	96.7	72.3	59.2	119	1	4
University of Maryland	15MDX2	37	92.7	69.3	59.9	118	1	3
Armor Seed, LLC	Mayhem	37	105.3	78.6	57.9	119	1	1
Eddie Mercer Agriservices	MBX 14-S-210	37	99.4	74.3	57.8	119	1	2
Syngenta	SY VIPER	37	100.0	74.7	59.0	117	1	2
UniSouth Genetics	USG 3197	37	103.6	77.4	57.7	118	1	3
Virginia Tech University	HILLARD	37	100.9	75.4	59.3	117	1	1
Virginia Tech University	VA11W-108 PA	37	92.8	69.3	58.2	118	1	1
Mid-Atlantic Seeds	MAS#316	37	110.4	82.4	58.2	116	1	1
CROPLAN	SRW9606	37	105.1	78.5	57.7	119	1	2
CROPLAN	SS8415	37	103.5	77.3	58.4	118	1	1

Dual Use Wheat: You can make two sales from one crop.

Of the 57 entries in the Wheat State Trials in 2016-2017, on 21 had straw heights of 37" or more. Of these, 12 varieties had greater-than-average grain yields.

Objective 2) Inoculated Wheat Scab Nursery:

A special inoculated nursery (scabby corn) with misting irrigation was planted at the USDA Research and Experiment Station at Beltsville in October, 2017. This experiment will stress test all varieties submitted to the Maryland Wheat and Barley State Trials for scab resistance. For the 2016/2017 season, a misted nursery was be grown and inoculated with *fusarium* head blight (scab), with assistance from Dr. Nathan Kleczewski, plant pathologist at the University of Delaware.

To replicate producer practices, seed weight and DON was measured from samples taken from combine-harvested material. Measurements also included *fusarium* damaged kernels (FDK), seed weight, and DON (at a USWBSI accredited testing facility). Analysis of DON takes significantly longer than the other measurements, so DON results were posted after the initial results.

Table 4. DON, and index (overall amount of plot with symptoms) for the 2017 wheat misted nursery trial located in Beltsville, MD.

Brand	Variety	Index	DON
Mid-Atlantic Seeds	MAS816	15.39	0.77
University of Maryland	15MDX6	9.14	1.00
Mid-Atlantic Seeds	MAS#61	2.22	2.43
University of Maryland	MDX17	8.95	2.84
Mid-Atlantic Seeds	MAS#67	4.14	3.01
Virginia Tech University	VA11W-108PA	7.12	3.58
Limagrain Cereal Seeds	LCS3204	2.60	3.60
Dyna-Gro	9750	3.37	3.64
Syngenta	OAKES	3.44	3.76
University of Maryland	Luisa	1.10	3.84
Eddie Mercer Agriservices	MBX14-S-210	1.75	3.91
Virginia Tech University	VA13W-38	2.75	4.15
Eddie Mercer Agriservices	MBX17-P-275	2.44	4.34
UniSouth Genetics	USG3197	3.62	4.35
Growmark FS	FSX871	3.50	4.38
Limagrain Cereal Seeds	LCS4601	5.64	4.45
UniSouth Genetics	USG3228	2.56	4.47
Dyna-Gro	9772	2.77	4.51
Growmark FS	FS860	2.93	4.53
Syngenta	SY007	4.90	4.71
Mid-Atlantic Seeds	MAS#65	6.68	5.14
University of Maryland	MDX1	3.80	5.16
University of Maryland	15MDX5	3.88	5.20
Syngenta	SYVIPER	5.30	5.21
Dyna-Gro	WX17782	2.27	5.27
UniSouth Genetics	USG3549	2.12	5.44
Syngenta	SY547	3.65	5.59
Armor Seed, LLC	ARW1611	1.97	5.87
Eddie Mercer Agriservices	MBX17-M-245	6.20	6.03
Armor Seed, LLC	ARW1514	4.93	6.04
Eddie Mercer Agriservices	MBX16-B-203	4.50	6.16
Growmark FS	FSX872	9.65	6.17
Mid-Atlantic Seeds	MAS#6	2.60	6.23
Armor Seed, LLC	ARW1575	10.83	6.30
UniSouth Genetics	USG3404	4.71	6.54
Mid-Atlantic Seeds	MAS716	0.89	6.73
UniSouth Genetics	USG3458	21.19	6.83
Virginia Tech University	VA11W-279	8.11	6.97
Dyna-Gro	WX16722	4.68	7.06
UniSouth Genetics	USG3536	1.65	7.31
Armor Seed, LLC	MAYHEM	7.75	7.32
Dyna-Gro	9701	3.36	7.34
Mid-Atlantic Seeds	MAS316	1.48	7.4
UniSouth Genetics	USG3201	2.69	7.43
Mid-Atlantic Seeds	MAS#35	8.56	7.52
Mid-Atlantic Seeds	MAS#69	3.82	7.95
Armor Seed, LLC	ARW1610	4.17	8.19
Virginia Tech University	HILLARD	4.67	8.21
Mid-Atlantic Seeds	MAS#42	2.7	8.36
Limagrain Cereal Seeds	L11550	2.94	8.55
University of Maryland	MDX2	0.87	8.55
Syngenta	SY100	2.12	8.6
Mid-Atlantic Seeds	MAS116	1.48	9.65

There were 57 entries in the Wheat State Trials in 2016-2016. The misted nursery was planted in Beltsville, MD. **Green = DON levels are statistically reduced compared to moderately susceptible MS/S standard, Shirley. DON of Shirley was 16.01 ppm.**

Objective 3:

Collaborative Line Breeding Nurseries with Other Programs: These regional trials are carried out in collaboration with small grains programs at public and private institutions to increase the applicability of line selection to both local Maryland environments and for more widespread use. The University of Maryland is actively participating in the Uniform Eastern Winter Nursery, the Uniform Southern Winter Nursery, the Winter Malting Barley, and the Grain Barley Nurseries (Table 5). This allows material from a variety of collaborating breeders to be selected based on their performance under Maryland conditions. **There are currently planted: 529 total plots to evaluate experimental lines for wheat and barley breeders under Maryland’s unique conditions.**

Table 7. Uniform Nursery Summary 2016-17

Uniform Nursery Performance

	Eastern (Clarksville)						Southern (Mid-Atlantic)														
				(VA Blk + War)			Wye						Blk, VA		War, VA		CL, NC		FI, SC		
	Rank	%Yield	Tst Wt	Rel Maturity	Ht	Rank	%Yield	Tst Wt	Rank	%Yield	Tst Wt	Rel Maturity	Ht	%Yield	Tst Wt	%Yield	Tst Wt	%Yield	Tst Wt	%Yield	Tst Wt
Hilliard (rank 1 southern)	11	105.7	59.6	99%, 119 d	35	5	109.1	59.5	14	103.7	57.6	101%, 115 d	37	114.1	58	110.3	60	115.3	57	134.3	-
15MDX11	27	95	60	100%, 120 d	35	15	103.8	59.2	19	97.8	58.2	100%, 114 d	36	85.9	56	101.5	60	84.3	57	104.5	-
15MDX6	33	88.3	60.4	99%, 118 d	35	29	93.3	59.1	16	101.7	59	97%, 111.5 d	37	87.2	58	96.5	60	97.6	58	95.1	-
15MDX5	35	86.22	61.1	99%, 118 d	35	31	93.5	60.1	13	104.8	59.6	100%, 114 d	36	84.6	58	92.7	60	110.9	58	113.8	-
DH96	-	-	-	-	-	-	-	-	36	71.8	53.5	-	34	-	-	-	-	-	-	-	-

Objective 4) Release of Improved Wheat Germplasm

Through the longtime support by MDGUP of Dr. Jose Costa and Dr. Jason Wight’s wheat improvement programs, six total wheat lines were released this year. Four lines are being commercialized through Limagrain Cereal Seeds, and another variety “Luisa” is being made publicly available. All lines show superior yield potential for the Mid-Atlantic region.

Of the Limagrain lines, the current most popular is LCS AMMO. This has been licensed to 8 companies which sell from Missouri all the way to North Carolina. Another line, LCS L11541 has a license footprint of at least 17 states. The other two lines are currently being increased through foundation seedstock and will be offered in the Fall of 2018 for licensing.

Luisa is a publicly released variety that enables farmers to save seed and replant it the following year. Although it is sold as a cover crop seed, it also has superior yield when well managed.

Meetings Where Investigators’ Presentations Credited MGUP Support in 2017

- Maryland Commodity Classic, 2016
- Eddie Mercer Field Day, 2016
- Maryland Crop Improvement Association Annual Meeting, 2016
- Dorchester County Agronomy Meeting, 2016

Expenditures of the Maryland Small Grains Program for 2017

Account 4319001 - 2017 Variety Developm										Termination	Budget	\$ 16,000.00
Investigator Jason P Wight										Date	- Encumbered	\$ 3,900.00
Project -										12-01-2017	- Expenditures	\$ 12,090.65
Investigator											Uncommitted	\$ 9.35
Org Unit 1252701 - AGNR-PSLA												
Sub-Code	Reference Number	Trx Date	Check #	Vendor Name	Trx Type	Original Encumbrance	Expenditures	Encumbrance Remaining	Date Paid	\$		
2075	R-PA-Y72394966	04-07-2017	PY04-01-2017	Alyssa Christine Mills	PE	480.00	480.00		04-07-2017		C	
			PY04-15-2017	Alyssa Christine Mills	PE		720.00		04-21-2017		C	
			PY04-29-2017	Alyssa Christine Mills	PE		480.00		05-05-2017		C	
			PY05-13-2017	Alyssa Christine Mills	PE		480.00		05-19-2017		C	
			PY05-27-2017	Alyssa Christine Mills	PE		420.00		06-02-2017		C	
			PY06-10-2017	Alyssa Christine Mills	PE		498.00		06-16-2017		C	
			PY07-08-2017	Alyssa Christine Mills	PE		602.00		07-14-2017		C	
			PY09-02-2017	Alyssa Christine Mills	PE		490.00		09-08-2017		C	
			PY09-16-2017	Alyssa Christine Mills	PE		700.00		09-22-2017		C	
			PY09-30-2017	Alyssa Christine Mills	PE		371.00		10-06-2017		C	
			PY10-14-2017	Alyssa Christine Mills	PE		70.00	0.00	10-20-2017		C	
2075	R-PA-Y72394966	04-07-2017		Alyssa Christine Mills	PE	480.00	5,311.00	0.00				
2075	R-PA-Y120539	06-02-2017	PY05-27-2017	Jessica Leigh Whitaker	PE	126.96	126.96		06-02-2017		C	
			PY06-10-2017	Jessica Leigh Whitaker	PE		81.00		06-16-2017		C	
			PY06-24-2017	Jessica Leigh Whitaker	PE		252.00		06-29-2017		C	
			PY07-08-2017	Jessica Leigh Whitaker	PE		920.04		07-14-2017		C	
			PY07-22-2017	Jessica Leigh Whitaker	PE		324.00		07-28-2017		C	
			PY08-05-2017	Jessica Leigh Whitaker	PE		621.00		08-11-2017		C	
			PY08-19-2017	Jessica Leigh Whitaker	PE		86.04		08-25-2017		C	
			PY09-02-2017	Jessica Leigh Whitaker	PE		641.04		09-08-2017		C	
			PY09-16-2017	Jessica Leigh Whitaker	PE		213.00		09-22-2017		C	
			PY09-30-2017	Jessica Leigh Whitaker	PE		54.96		10-06-2017		C	
			PY10-14-2017	Jessica Leigh Whitaker	PE		231.00	0.00	10-20-2017		C	
2075	R-PA-Y120539	06-02-2017		Jessica Leigh Whitaker	PE	126.96	3,551.04	0.00				
2725	R-PA-Y72394966	04-07-2017	PY09-02-2017	Alyssa Christine Mills	PE	37.49	37.49	0.00	09-08-2017		C	
2725	R-PA-Y120539	06-02-2017	PY06-24-2017	Jessica Leigh Whitaker	PE	19.27	19.27		06-29-2017		C	
			PY07-08-2017	Jessica Leigh Whitaker	PE		70.39		07-14-2017		C	
			PY07-22-2017	Jessica Leigh Whitaker	PE		24.78		07-28-2017		C	
			PY08-05-2017	Jessica Leigh Whitaker	PE		47.52		08-11-2017		C	
			PY08-19-2017	Jessica Leigh Whitaker	PE		6.57		08-25-2017		C	
			PY09-02-2017	Jessica Leigh Whitaker	PE		49.05	0.00	09-08-2017		C	
2725	R-PA-Y120539	06-02-2017		Jessica Leigh Whitaker	PE	19.27	217.58	0.00				
2770	R-PA-Y72394966	04-07-2017	PY09-02-2017	Alyssa Christine Mills	PE	1.37	1.37	0.00	09-08-2017		C	
2770	R-PA-Y120539	06-02-2017	PY06-24-2017	Jessica Leigh Whitaker	PE	0.71	0.71		06-29-2017		C	
			PY07-08-2017	Jessica Leigh Whitaker	PE		2.58		07-14-2017		C	
			PY07-22-2017	Jessica Leigh Whitaker	PE		0.91		07-28-2017		C	
			PY08-05-2017	Jessica Leigh Whitaker	PE		1.74		08-11-2017		C	
			PY08-19-2017	Jessica Leigh Whitaker	PE		0.24		08-25-2017		C	
			PY09-02-2017	Jessica Leigh Whitaker	PE		1.79	0.00	09-08-2017		C	
2770	R-PA-Y120539	06-02-2017		Jessica Leigh Whitaker	PE	0.71	7.97	0.00				
3918	R-ILW-4-32017-1	03-29-2017	PK105120170517	CANTWELL-CLEARY CO., INC-	E	2,934.00	2,934.00	0.00	05-17-2017		C	
3952	R-FL-S3336	09-13-2017	529991	Correct Peard allocation-PLS3336	E	23.91	23.91	0.00	09-13-2017		C	
3952	R-FL-S3336	09-13-2017	529991	Correct Peard allocation-PLS3336	E	6.29	6.29	0.00	09-13-2017		C	
		12-30-2017		Mechanical Service Center				3,900.00	12-20-2017		C	
Total Current Activity						3,630.00	12,090.65	3,900.00				
Sub-Total for Project						\$ 3,630.00	\$ 12,090.65	\$ 3,900.00				
Total for Account 4319001 - 2017						\$ 3,630.00	\$ 12,090.65	\$ 3,900.00				
										Budget	\$ 16,000.00	
										- Encumbered	\$ 3,900.00	
										- Expenditures	\$ 12,090.65	
										Uncommitted	\$ 9.35	