

Sacramento Valley Water Quality Coalition

Annual Management Practice Implementation and Nitrogen Management Report

2020 Crop Year

Prepared for
Central Valley Regional Water Quality Control Board

Prepared by
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TABLE OF CONTENTS

List of Appendices.....	ii
List of Attachments.....	ii
List of Figures.....	ii
List of Tables.....	ii
List of Acronyms	iv
Executive Summary	v
1 Introduction	1
2 Background	2
3 INMP Summary Report Evaluation	3
3.1 Summary of Member Data Collection.....	4
3.2 Summary of Member Data Quality Evaluation	4
3.3 Data Exclusions	7
3.4 N Removed Data Sources and Procedures.....	7
3.5 Spatial Join	11
3.6 Documentation of Statistical Procedures and Tools.....	12
3.6.1 Crop Grouping.....	12
3.6.2 INMP Summary Statistics.....	14
3.6.3 Soil Type Evaluation	15
3.6.4 Irrigation Type Evaluation.....	16
3.7 INMP Results	16
3.7.1 INMP Statistical Analysis Results	16
3.7.2 Soil Type Evaluation Results	21
3.7.3 Irrigation Type Evaluation Results	24
3.8 INMP Analysis Conclusions.....	29
3.9 Member Feedback and Outreach	30
4 Summary of Annual Management Practice Information.....	30
4.1 INMP Management Practices.....	30
4.1.1 Irrigation Method	30
4.1.2 Irrigation and Nitrogen efficiency practices	31
4.2 Farm Evaluation	31

4.2.1	FE Data Collection and Quality Assessment	32
4.2.2	Crop Summary	33
4.2.3	Irrigation Practices Summary.....	35
4.2.4	Sediment and Erosion Practices Summary	35
4.2.5	Pesticide Management Practices Summary.....	36
4.2.6	Wells Summary	37
4.3	Management Practice Implementation Report	37
5	Annual INMP Summary Report Data	38
6	References	38
	Appendices	39

LIST OF APPENDICES

Appendix A: INMP Summary Statistics by Crop

Appendix B: Example INMP Member Feedback Report

Appendix C: INMP Statistical Groupings and Exclusion Thresholds by Crop

LIST OF ATTACHMENTS

Attachment 1: Annual Management Practice Implementation Data

Attachment 2: Annual Irrigation and Nitrogen Management Plan Summary Report Data

LIST OF FIGURES

Figure 1. Subwatersheds within Coalition.3

Figure 2. Interpretation diagram for box and whisker plot.....15

Figure 3. Crop acreage totals for submitted INMP summary reports.17

Figure 4. Box and whisker plot showing the yield per acre for the highest acreage crops.....20

Figure 5. Box and whisker plot showing the N applied per acre for the highest acreage crops.21

Figure 6. Crop acreage percentages for submitted FE reports.33

LIST OF TABLES

Table 1. Summary of Order requirements for Annual Report Components 19 and 20.2

Table 2. Status of INMP summary reports received.4

Table 3. Estimated yield unit weights for conversion from volumetric units.....	5
Table 4. Yield basis conversion factors.....	7
Table 5. N removed (R) conversion factors.....	8
Table 6. Perennial tissue N removed.....	11
Table 7. Crop types grouped into different categories for statistical analysis.....	12
Table 8. Orchard full production ages.	13
Table 9. Summary of crops reported on INMP summary reports.....	17
Table 10. Evaluation of soil drainage class effect on A/R.	22
Table 11. Multiple comparisons test of soil drainage classes for crop types with a significant effect of drainage class on A/R.	23
Table 12. Evaluation of irrigation type effect on A/R.	25
Table 13. Multiple comparisons test of irrigation types for crop types with a significant effect of irrigation type on A/R.	27
Table 14. Irrigation method summary.....	30
Table 15. N management efficiency practices reported by members for 2020 CY.	31
Table 16. Irrigation management efficiency practices reported by members for 2020 CY.....	31
Table 17. Status of Farm Evaluations received.....	33
Table 18. Acreage of crops with >1,000 acres for submitted FE reports.	34
Table 19. Irrigation management practices reported by members for 2020 CY.....	35
Table 20. Sediment and erosion management practices reported by members in 2020.	36
Table 21. Pesticide management practices reported by members in 2020.....	36
Table 22. Wellhead protection practices reported by members in 2020.....	37

LIST OF ACRONYMS

A	N Applied
A/R	Ratio of Nitrogen Applied to Nitrogen Removed
A/Y	Ratio of Nitrogen Applied to Yield
A-R	Nitrogen Applied Minus Nitrogen Removed
AUM	Animal Unit Month
CV	Coefficient of Variation
GAR	Groundwater Quality Assessment Report
GQMP	Groundwater Quality Management Plan
HVA	High Vulnerability Area
INMP	Irrigation and Nitrogen Management Plan
LTILRP	Long-Term Irrigated Lands Regulatory Program
MC	Medcouple Statistic
MPIR	Management Practice Implementation Report
MRP	Monitoring and Reporting Program
MU	Management Unit
N	Nitrogen
NCWA	Northern California Water Association
NR	Not Reported
PLSS	Public Land Survey System
R	Nitrogen Removed
RWQCB	Regional Water Quality Control Board
SSURGO	Soil Survey Geographic Database
SQMP	Surface Water Quality Management Plan
SVWQC	Sacramento Valley Water Quality Coalition
WDRs	Waste Discharge Requirements

EXECUTIVE SUMMARY

Subwatersheds within the Sacramento Valley Water Quality Coalition (Coalition) collected Irrigation and Nitrogen Management Plan (INMP) Summary Reports and Farm Evaluations (FE) for the 2020 crop year (CY) that were sent out to Coalition members. Management Practice Implementation Reports (MPIR) were also collected, but for the 2020 CY, no additional information beyond what was already reported for the FE and INMP had to be collected.

The individual Coalition subwatersheds (Subwatersheds) assembled member data and submitted aggregated data for further analysis. The data were reviewed and checked for errors and omissions, and members were contacted to correct any noticeable errors. Data reported online continued to have few errors. Data collected via paper forms, which increased in 2021 due to low vulnerability Subwatersheds reporting for the first time, generally had more errors than data reported online. While a significant effort was made to correct all errors, some errors may have gone undetected. The 2020 INMP return rate was approximately 94% of members with 6,250 members reporting (24,857 fields; 1,114,820 acres), compared to a 2019 INMP return rate of approximately 97% of members with 3,084 members reporting. 2020 INMP data that was not reported consisted of 414 members (979 fields; 31,472 acres). 2020 FE data was submitted by 6,363 members (25,322 fields; 1,099,637 acres), while 432 members did not submit reports (1,059 fields; 32,367 acres).

For INMP for the 2020 CY, only single-year AR ratios (A/R and A-R) were calculated since this was the first year of INMP reporting where field tracking over time was implemented. Three-year AR ratios will be available starting in 2023 (2022 CY) for applicable crops. Young orchards were not included in the outlier analysis because the nitrogen (N) removed rates are generally not comparable to orchards at full production. AR ratio summary statistics were summarized by crop type and included the following: mean, standard deviation, histogram plots, box and whisker plots, and high outliers. Some of the highest outliers may be due to reporting errors, although the exclusion of records with unreasonable N applied or yield values limited this. The outlier status and AR results will be provided in individualized feedback reports to each member as part of the Coalition's education and outreach program.

The INMP statistical comparison of A/R by soil type and irrigation method showed that several crops had a significant effect. Since the data was non-normally distributed, a non-parametric Kruskal-Wallis test was utilized. For the soil type test there were generally high enough sample sizes in each class for the test to be reliable, but for irrigation type some irrigation methods had fewer than five observations, which limit the reliability of the test. Several crops had a significant effect of soil drainage class or irrigation method on A/R, but the specific soil drainage classes and irrigation methods that resulted in the highest A/R values varied by crop. For example, walnuts tended to have lower A/R values in well drained soils, while wine grapes tended to have higher A/R values in well drained soils. In addition, some of the significant effects for irrigation methods were for methods that comprised a small percentage of the total acres. For example, 90% of the walnut fields had sprinkler or micro-sprinkler irrigation which

were not significantly different from each other, while drip irrigated walnuts, which had significantly higher A/R than sprinkler and micro-sprinkler, comprised only 4% of walnut fields.

The FE data showed that many members in the Coalition are utilizing practices to improve irrigation efficiency, minimize erosion and sediment discharge, improve pesticide applications, and protect irrigation wellheads.

The MPIR utilized information collected from the FE and INMP for the 2020 CY. In subsequent years, additional information on irrigation distribution uniformity will be collected.

1 INTRODUCTION

The Central Valley Regional Water Quality Control Board (RWQCB) developed the Long-Term Irrigated Lands Regulatory Program (LTILRP) to address surface water quality and to add groundwater quality monitoring and reporting requirements for agricultural irrigated land. The requirements were adopted as Waste Discharge Requirements (WDRs) and an associated Monitoring and Reporting Program (MRP) (General Order No. R5-2014-0030-R1).

The Sacramento River Watershed WDRs for members of the Sacramento Valley Water Quality Coalition (Coalition) require all members to prepare an Irrigation and Nitrogen Management Plan (INMP) annually, and update Farm Evaluations (FE) every five years. The WDRs require the Coalition to submit an INMP Summary Report for the previous crop year (CY) beginning in 2021 and to submit FE data from the most recent FE in Excel workbook format annually. The Coalition is also required to submit a Management Practice Implementation Report (MPIR) annually in Excel workbook format. For CY 2020, the MPIR includes management practice information collected in the FE and INMP templates. Thereafter, MPIR data will also include data collected on irrigation distribution uniformity.

This Annual Management Practice Implementation and Nitrogen Management Report includes both the INMP Summary Report evaluation and the FE data summary from CY 2020 (Annual Report Components 19 and 20 in the WDRs), the requirements of which are summarized in Table 1. For INMP, the Coalition is required to summarize member INMP data, discussed in Section 3, including comparisons of the ratio of nitrogen (N) applied to N removed (A/R) and the difference between N applied and N removed (A-R) by crop type for single year and multi-year intervals. These statistical comparisons are provided in Appendix A. Since 2021 was the first year of reporting with INMP requirements, only single year ratios could be calculated for A/R and A-R. Three-year average ratios for A/R and A-R will be available starting in 2023 (2022 CY) for applicable fields. The Coalition will report back to each member, separate from this report, A/R and A-R estimates for each of the member's parcels compared to other members with the same crop in the Coalition. An example of this report is provided in Appendix B.

For FE, the Coalition is required to aggregate, summarize, and provide a quality assessment of the data collected. A summary of the FE data is provided in Section 4. Management practice data from the FE surveys and the INMP surveys are provided in Excel workbook format in Attachments 1 and 2, as required in the Order.

In summary, this report includes the following components:

- INMP Summary Report Evaluation
- Summary of Annual Management Practice Information (INMP, FE, and MPIR)
- Annual Management Practice Implementation Data in Excel workbook format (Attachment 1)
- Annual Irrigation and Nitrogen Management Plan Summary Report Data in Excel workbook format (Attachment 2)

Table 1. Summary of Order requirements for Annual Report Components 19 and 20.

Summary of Requirements for INMP (Report Component No. 19)
Evaluation of A/R and A-R ratios by crop type
Evaluation of A/R and A-R by irrigation method, soil conditions, and farming operation size for each crop type
Evaluation of A/R single year and A/R multi year differences by crop type
Provide mean, standard deviation, histogram plot, and box and whisker plot for A/R and A-R for each crop type
Provide a quality assessment of the collected information (e.g. missing data, potentially incorrect/inaccurate reporting) and a description of corrective actions to be taken
Summary of Requirements for Management Practice Information (Report Component No. 20)
Aggregate and summarize FE data
Provide a quality assessment of the collected information by township (e.g. missing data, potentially incorrect/inaccurate reporting) and a description of corrective actions to be taken

2 BACKGROUND

The area covered by the Coalition’s WDRs encompasses all the Sacramento River Watershed. For the 2020 Crop Year, the Coalition is operated as a partnership with 13 local subwatersheds (Subwatersheds) coordinated by the Northern California Water Association (NCWA) (Figure 1). In August 2021, the RWQCB exempted Goose Lake Subwatershed from the ILRP, meaning in future years there will be 12 local Subwatersheds working with NCWA. The Subwatersheds provide leadership for grower outreach and education about the importance of implementing practices protective of surface and groundwater quality, while NCWA, the third-party recognized by the RWQCB, manages development and implementation of surface water monitoring, annual reporting, and other Coalition deliverables, such as this report. Irrigated agriculture of the Coalition extends over 1.3 million acres, roughly 8% of the Sacramento River Watershed (excluding rice, which is covered under a separate RWQCB order). The remaining approximate 92 percent of the Sacramento River Watershed consists of open space, riparian vegetation, and urban development.

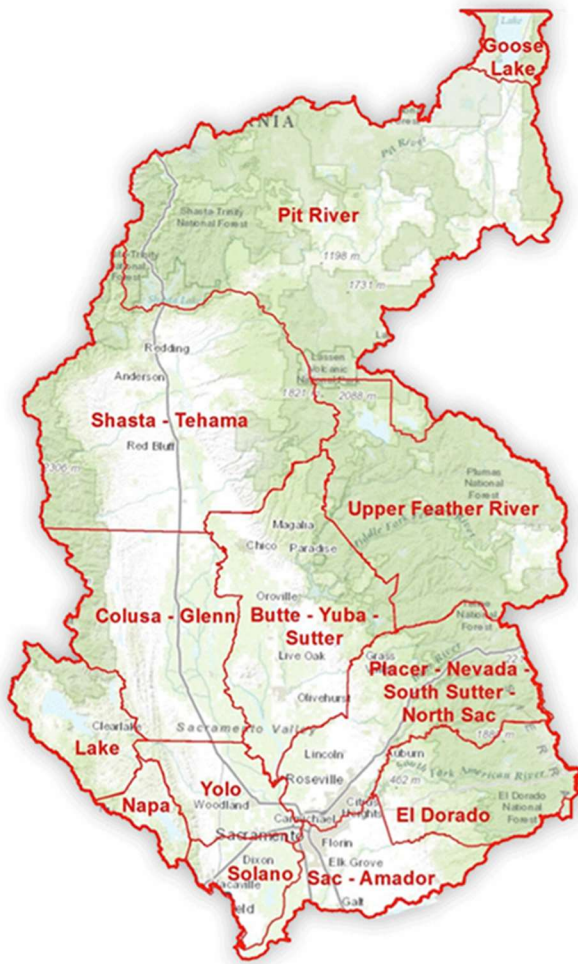


Figure 1. Subwatersheds within Coalition.

3 INMP SUMMARY REPORT EVALUATION

This section of the report summarizes the INMP Summary Report evaluation. The initial steps of INMP data collection, quality assessment, and clean-up are discussed in Sections 3.1 and 3.2. Following collection and clean-up of the INMP data, any remaining fields with questionable values were excluded from the statistical analysis using the criteria discussed in Section 3.3. After exclusion of questionable data, AR ratios (A/R and A-R) were calculated for the remaining fields to be analyzed using the data sources presented in Section 3.4, and each field was joined to county parcel shapefiles, where possible, to determine spatial information (Section 3.5). The INMP data was then analyzed using the methods described in Section 3.5 to determine high outliers for AR ratios by crop type and to assess potential effects of soil type and irrigation method on AR ratios. The results of these analyses are provided in Appendix A and summarized in Section 3.7.

3.1 SUMMARY OF MEMBER DATA COLLECTION

On the INMP Summary Reports, members report irrigation and N data for each field, including crop, irrigated acres, N applied (A), yield (Y), planting year, irrigation method, and efficiency practices utilized for irrigation and N. Most members use an online reporting system. Members submitted INMP Summary Reports to the Subwatershed in which their fields are located, which were then exported to a spreadsheet, if collected online, or manually entered into a standardized MS Excel template if collected via paper form.

The completion statistics for the 2020 INMP Summary Reports are summarized in Table 2. INMP data was received for 24,857 fields representing 6,250 members and 1,114,820 acres. INMP data that was not reported comprised approximately 979 fields representing 414 members and 31,472 acres, estimated from prior years' data, where available. The overall member completion percentage for INMP Summary Reports for the 2020 CY (approximately 94%; 6,250 members reporting) was slightly lower than the 2019 CY (approximately 97%; 3,084 members reporting). This was due to members in low vulnerability areas, including five Subwatersheds with only low vulnerability areas, having to report for the first time. Data reported online continued to have few errors while data collected via paper forms generally had more errors due to low vulnerability Subwatersheds reporting for the first time. Several attempts were made by Subwatershed staff to contact members with outstanding reports. Any outstanding surveys received after the submittal of this report will be submitted electronically with the following year's INMP Report.

Table 2. Status of INMP summary reports received.

INMP Submission Status	Members	Fields	Crop Acres
Not Submitted	414	979	31,472
Submitted	6,250	24,857	1,114,820

Notes:

Nine of the submitted reports were only partially complete.

The acreage and field count for reports not submitted is based on the prior years' data, except for the Subwatersheds reporting via paper forms where this information was not available.

3.2 SUMMARY OF MEMBER DATA QUALITY EVALUATION

The Coalition initially checked all returned forms for completeness and flagged any potential errors. Any INMP data flagged during the review process was sent to the applicable Subwatershed for follow-up with the member. The members reporting online generally had few errors, while the Subwatersheds reporting via paper forms had the most errors. Common errors identified during the review process and corrections applied included:

1. Incomplete reporting of field parameters, such as planting year for perennial crops, or management practice information for irrigation and N.

2. Amount of N fertilizer applied per acre was greater than 450 lbs/acre, which is typically the maximum reasonable value for the crops grown within the Coalition. This could have been the result of a transcription error, reporting total fertilizer applied versus the percent of N in the fertilizer, or total N applied for the field instead of per acre.
3. Production unit was not correct (e.g. tons was listed when the actual unit was lbs) or was provided on a volume basis rather than a mass basis (e.g. number of trees, cut flowers, square feet of turf, etc.). Corrections from volume to mass basis were made where possible based on typical values for the crop type (Table 3).
4. Yield was much higher than the typical range of values for the given crop, as shown in Appendix C. This was typically the result of either a transcription error, failure to convert yield units to pounds (lbs), or using total yield instead of yield per acre.
5. Yield was reported on a different basis than the typical standard for the crop. For example, prune yields are typically reported on a dry basis, but some members may have reported on a wet basis. Nut crops can also be reported as gross weight, in-shell weight, or kernel/meat weight. The Coalition requested that members indicate the yield basis on their INMP Summary Reports, but some members did not fill this out or entered an incorrect basis. All reported yields were converted, where possible, to the typical standard reporting basis for the crops listed in Table 4. If the yield basis conversion resulted in a more unreasonable yield value than the originally reported yield, the original value was kept.
6. Member-reported APN did not have a matching APN in the corresponding county GIS parcel database. These discrepancies typically occurred because of a transcription error or in some cases because the parcel had been redrawn but had not been updated within the county GIS shapefile.

For members reporting online, corrections were made through the webtool by either the member or Subwatershed staff. After the initial data flagging and review period, the dataset was reviewed a final time. The final dataset included some late submissions that were not captured during the initial review. Any remaining errors meeting the criteria discussed in Section 3.3 were excluded from the statistical analysis.

Table 3. Estimated yield unit weights for conversion from volumetric units.

Crop	Volumetric Yield Unit	Estimated Yield Unit Weight
Apple	bin	900 lbs/bin
Kiwifruit	tray	7 lbs/tray
Christmas Trees	number of trees	50 lbs/tree
Pasture	animal unit month (AUM)	1,000 lbs/AUM
Cotton	bale	500 lbs

Table 4. Yield basis conversion factors.

Crop	Reported Basis	Standard Basis	Conversion Factor to Standard Basis
Almond	gross	kernel	0.27
Almond	in-shell	kernel	0.59
Walnut	gross	in-shell	0.82
Walnut	kernel	in-shell	2
Pistachio	gross	in-shell (CPC)	0.82
Pecan	kernel	in-shell	2
Prune	fresh fruit	dried fruit	0.33

3.3 DATA EXCLUSIONS

After outreach was completed, the following exclusions were made prior to statistical analysis:

1. Exempt crops (rice, non-irrigated crops, fallow, pasture with no N applied, wetlands, or aquaculture)
2. Records missing any of the following:
 - a. APN
 - b. crop,
 - c. N applied, or
 - d. Yield or yield unit if N applied > 0
3. N applied greater than 600 lbs/acre (lower threshold of 450 lbs/ac was used for member follow-up during QC)
4. Yield values above or below the reasonable range for the reported crop, shown in Appendix C

3.4 N REMOVED DATA SOURCES AND PROCEDURES

After data exclusion, A/R and A-R were calculated for all remaining records, where possible. For crops where R could not be calculated, A/Y was calculated instead. To calculate R, the amount of N removed in the harvested portion of each crop, the Coalition relied on estimates from:

Nitrogen concentrations in harvested plant parts - A literature overview (Geisseler, 2021)

http://geisseler.ucdavis.edu/Geisseler_Report_U1_2021_03_31.pdf

This report includes information on N removal values for each crop as shown in Table 5, and includes complete references for studies providing N removal data, as well as the following information:

- A coefficient of variation (CV) is provided, which indicates the variability among the published values for a specific crop.

- The number of published values both within and outside of California is also shown. In some cases, there are several studies that provide N removal values; in other cases, there are only one or two studies. Similarly, for some crops N removal values are reported from various parts of the Central Valley, while for other crops, values may be for other states.
- The time period when the values were published are presented in the detailed discussion of each crop.

While the information in Geisseler (2021) provides several factors to evaluate the relevance of N removal values, it does not give an overall confidence rating or reflect all the information and criteria that needs to be considered to determine how well the N removal values represent crop varieties grown within the Coalition. Therefore, the N removal values in Geisseler (2021) are used in this analysis because they are the best available sources of data, but they should not be considered definitive, and they should be expected to change and improve over time.

The N accumulated in the perennial tissues of permanent crops, which can vary by age, is also added to the amount of N removed, where values are available. Currently, Geisseler (2021) only provides values for almonds for perennial tissue accumulation, which are listed by orchard age in Table 6. These values were added to the N removed for the 2020 CY for any almond orchards with planting year reported. If planting year was not reported for an almond orchard, the perennial tissue N removed was not included in the AR ratios.

Table 5. N removed (R) conversion factors.

Crop	No. of Observations		CV (%)	N Removed Conversion Factor (lbs N/lbs yield)
	California	Total		
Field Crops				
Alfalfa – Hay	49	49	12.5	0.031150
Alfalfa – Silage	6	6	17.5	0.012000
Barley – Grain	4	61	14.6	0.016800
Barley – Straw	0	970	31.3	0.007700
Beans, Dry - Blackeye	1	164	10.4	0.036500
Beans, Dry - Garbanzo	2	108	11.3	0.033600
Beans, Dry - Lima	2	75	5.4	0.036150
Corn – Grain	0	1,775	20.8	0.012000
Corn – Silage	96	96	10.9	0.003765
Cotton	49	49	16.1	0.021700
Fescue, Tall - Hay	260	260	16.2	0.025400
Oat – Grain	0	134	9.6	0.018850
Oat – Straw	2	526	34.7	0.007400
Oat – Hay	49	49	18.2	0.010850
Orchard Grass - Hay	60	60	20	0.027250

Crop	No. of Observations			N Removed Conversion Factor (lbs N/lbs yield)
	California	Total	CV (%)	
Ryegrass, Perennial - Hay	60	60	16.8	0.027450
Safflower	140	140	10.2	0.025850
Sorghum – Grain	0	256	29.7	0.016500
Sorghum - Silage	260	260	21	0.003670
Sunflower	24	24	11.1	0.031600
Triticale - Grain	51	51	13	0.020200
Triticale - Straw	0	102	38.3	0.005750
Triticale - Silage	19	19	13.7	0.004515
Wheat, Common - Grain	113	113	10.3	0.021500
Wheat - Straw	3	494	33	0.006900
Wheat - Silage	39	39	18.6	0.005250
Wheat, Durum - Grain	41	41	3.7	0.021050
Vegetables				
Asparagus	2	19	14	0.002925
Beans, Green (Snap Beans)	1	122	25.7	0.002890
Broccoli	15	46	20.4	0.005600
Carrots	64	64	22.7	0.001400
Corn, Sweet	0	50	13.1	0.003585
Cucumbers	1	10	17.4	0.001080
Garlic	1	12	19.5	0.007550
Lettuce, Iceberg	45	68	16.7	0.001315
Lettuce, Romaine	14	26	13.7	0.001810
Melons, Cantaloupe	1	31	15.5	0.002435
Melons, Honeydew	1	12	22.1	0.001475
Melons, Watermelons	1	6	23.9	0.000695
Onions	13	45	19.7	0.001970
Pepper, Bell	6	40	7.9	0.001655
Potatoes	5	64	13.6	0.003120
Pumpkin	1	13	10.1	0.003680
Squash	11	74	22.4	0.001835
Sweet Potatoes	11	23	16.8	0.002370
Tomatoes, Fresh market	1	34	16.5	0.001305
Tomatoes, Processing	195	195	15.0	0.001460

Crop	No. of Observations		CV (%)	N Removed Conversion Factor (lbs N/lbs yield)
	California	Total		
Tree and Vine Crops				
Almonds	31	31	4.1	0.068000
Apples	1	132	35.1	0.000540
Apricots	1	22	114	0.002780
Cherries	1	24	19.8	0.002210
Figs	1	19	18.1	0.001270
Grapefruit	26	27	7.8	0.001480
Grapes - Raisins	16	19	5.8	0.005050
Grapes - Table	16	19	5.8	0.001130
Grapes - Wine	8	38	13	0.001800
Lemons	21	22	10	0.001290
Nectarines	31	41	27.1	0.001820
Olives	6	29	22.8	0.003140
Oranges	26	82	10.9	0.001480
Peaches	81	81	19.0	0.001520
Pears	1	64	17.9	0.000645
Pistachios	156	156	21.6	0.010200
Plums	24	24	14.5	0.001135
Pomegranate	0	7	15	0.00198
Prunes	18	18	16.3	0.005600
Tangerines	1	2	29.2	0.001270
Walnuts	24	24	10.9	0.015900

Notes:

- a. Conversion factors are calculated from N concentrations expressed in lbs/ton at a moisture content common for the respective crop at harvest.
- b. The calculated value for N removed is only accurate on a multi-year basis and may not be accurate for a specific year.
- c. For perennial crops, N accumulation in perennial tissue is not included in the value, except for almonds.
- d. For most crops where marketable yield is reported and cull or trash is removed in a processing facility, the calculated amount of N removed underestimates the actual amount because it does not include the N in cull or trash.

Table 6. Perennial tissue N removed.

Crop	Age (years)	N demand for leaf and woody biomass (lbs/acre)
Almond	1	30
	2	55
	3	65
	4	55
	5	45
	6-15	10
	16-25	30

3.5 SPATIAL JOIN

The INMP data was joined to county parcel shapefiles, where possible, and the parameters used in the statistical analysis or required data deliverables were determined via spatial join in GIS. Parcel data was obtained for the most recent year available from each county where INMP data was reported, with the exception of Modoc, Lassen, and Sierra counties, which did not offer free parcel data. The INMP data was joined to the county parcel shapefiles using a combination of APN and county, since some counties share the same APNs. Modoc, Lassen, and Sierra counties were excluded from the join since parcel data was not available; however, the INMP data for these counties was still included in the outlier statistical analysis. Many of the INMP APNs had to be reformatted to match the format of the parcel shapefiles. If a join match could not be found, then any subsequent spatial information was left blank for the INMP records without a parcel match. There were 1,843 fields out of the total fields submitted (1,128 of the analysis subset) that could not be matched to the county parcel shapefiles.

For the INMP records that could be mapped, the following parameters were determined via spatial join in GIS:

- Township and range –assigned based on the centroid of the parcel using the Public Land Survey System (PLSS) dataset from the California Department of Conservation Geologic Energy Management Division (CalGEM) (<https://gis.data.ca.gov/datasets/cadoc::public-land-survey-system-plss-sections/about>)
- HVA status – assigned based on centroid using the HVA layer from November 2016 revisions to the Coalition’s 2014 Groundwater Quality Assessment Report (GAR) (CH2M Hill, 2014; CH2M Hill, 2016). HVA status was only assigned for records that did not already have HVA assigned through the webtool
- Groundwater basin and sub-basin – assigned based on the centroid of the parcel using the California Department of Water Resources (DWR) Bulletin 118 groundwater basins

- Soil type – ready-to-use USDA Soil Survey Geographic Database (SSURGO) information packaged by ESRI was obtained and parcels were assigned to the SSURGO polygon with the largest overlap (<https://www.arcgis.com/apps/View/index.html?appid=cdc49bd63ea54dd2977f3f2853e07fff>)

3.6 DOCUMENTATION OF STATISTICAL PROCEDURES AND TOOLS

Statistical analysis of the INMP data was performed using Python, an open-source, high-level performing coding language. Fields were grouped by crop type and summary statistics were calculated at the Coalition level. The WDRs require that the evaluation of AR ratios by crop type include an evaluation of irrigation method, soil conditions, and farming operation size. Farming operation size is not currently requested from members on the approved INMP Summary Report or FE Templates, so this factor could not be analyzed. Operation size could be assumed to equal the sum of irrigated acres from INMP or FE reporting, but some members may have operations that span multiple subwatersheds, farm fields for multiple property owners, or have fields that were exempt from reporting such as pasture and rice, which makes defining the operation size difficult. In addition, only single-year AR ratios could be calculated for the 2020 CY because this was the first year of IMNP reporting. Multi-year AR ratios with three years of data will be available for applicable fields starting in 2023 for the 2022 CY.

3.6.1 CROP GROUPING

The Coalition grouped some similar crops together for the statistical analysis. Crops that were grouped into different categories than the specific crop type reported are shown in Table 7. Crops that were harvested in different ways (e.g. grain corn vs. silage corn) or different varieties (e.g. processing vs. fresh market tomatoes) were separated for the analysis. Some members did not indicate the specific crop type for these crops on their report. The Coalition attempted to determine this via follow-up with the member or by comparison of the reported yield to typical values. If the specific crop type could not be determined, it was followed by “-NR” indicating it was not reported.

Planting year for perennial crops was also requested by the Coalition. This was used to separate orchards at full production age from younger orchards for the statistical analysis. Since younger orchards generally have lower yields, the N removed rates are not comparable to orchards at full production. Only the orchards at full production age were analyzed for outliers, and since many growers did not report planting year, crops without a planting year were assumed to be at full production. The age thresholds used to determine full production age are shown in Table 8 and were developed from a combination of UCCE publications and expert opinion (A. Fulton - UCCE, personal communication).

Table 7. Crop types grouped into different categories for statistical analysis.

Specific Crop	Crop Grouping for Analysis
Alfalfa – Seed	Seed Crop
Barley	Barley – NR
Bean - Garbanzo	Bean Dry
Blueberry	Berry
Broccoli – Seed	Seed Crop

Specific Crop	Crop Grouping for Analysis
Cabbage – Seed	Seed Crop
Corn	Corn – NR
Cucumber – Seed	Vine Seed
Fescue	Hay/Forage
Grass Hay	Hay/Forage
Melon – Seed	Vine Seed
Millet	Millet – NR
Milo/Sorghum	Sorghum/Milo – NR
Mulberry	Misc Fruit Tree
Oat	Oat – NR
Olive – Oil	Olive
Onion – Seed	Seed Crop
Orange	Citrus
Pumpkin – Seed	Vine Seed
Ryegrass	Ryegrass – NR
Sorghum/Milo	Sorghum/Milo – NR
Squash – Seed	Vine Seed
Sudan Grass	Sudan Grass – NR
Tomato	Tomato - NR
Triticale	Triticale – NR
Turnip – Seed	Seed Crop
Watermelon – Seed	Vine Seed
Wheat	Wheat – NR

Table 8. Orchard full production ages.

Crop	Full Production Age (yrs)
Almond	6
Cherry	9
Citrus	8
Grape – Wine	4
Kiwi	6
Olive	5
Peach/Nectarine	7
Pear	8
Pecan	8
Pistachio	9

Crop	Full Production Age (yrs)
Plum/Pluot	5
Prune	8
Walnut	8

Notes:

Citrus value based on mandarins

Olive value based on high density oil olives

Peach/nectarine value based on processing varieties. Fresh pick varieties mature around year 5, but the Coalition did not require members to identify peach/nectarine varieties on their INMP summary reports.

3.6.2 INMP SUMMARY STATISTICS

The summary statistics calculated from the INMP data included the mean, standard deviation, minimum and maximum values, and number of outliers for A/R and A-R for each crop type in the Coalition. In addition, histogram plots and box and whisker plots of A/R and A-R for each crop were prepared. For crops without R values, A/Y values are shown instead of A/R and A-R. Non-bearing or zero yield fields were not included in the statistics since A/R cannot be calculated for these fields. Young orchards did not have outliers calculated, but the other summary statistics and the plots are presented. In addition, only single-year AR ratios could be calculated for the 2020 CY since this was the first year of implementation of INMP reporting requirements where field IDs will be tracked over time. Multi-year AR ratios with three years of data would be first available for applicable fields starting in 2023 for the 2022 CY.

Outliers were determined using the modified interquartile range (IQR) method of Hubert and Vandervieren (2008). This method adjusts the outlier threshold for skewness using the medcouple statistic (MC). When the data distribution is perfectly symmetrical, MC = 0 and the outlier threshold is the standard method of $\pm 1.5 * IQR$ from Tukey (1977). For crops with less than four unique values of A/R, A-R, or A/Y, outliers could not be calculated. These crops with a limited number of observations are shown in a table at the end of Appendix A, along with any unspecified crop categories (e.g. “other”, “misc fruit tree”). To avoid skewing the display of the histogram and box and whisker plots, values greater than three times the difference between the upper and lower whisker were not shown.

In the box and whisker plots, the boxes draw the 25th, 50th, and 75th percentiles, the whiskers show the outlier thresholds, and the dots above and below the box indicate the high and low outliers, respectively (Figure 2). Only high outliers represent potential over-application of N fertilizer and are shown in the outlier count in the summary tables for each crop in Appendix A. Outliers that are more than three times greater than the upper whisker were not displayed on the box and whisker plot to limit skewing of the data.

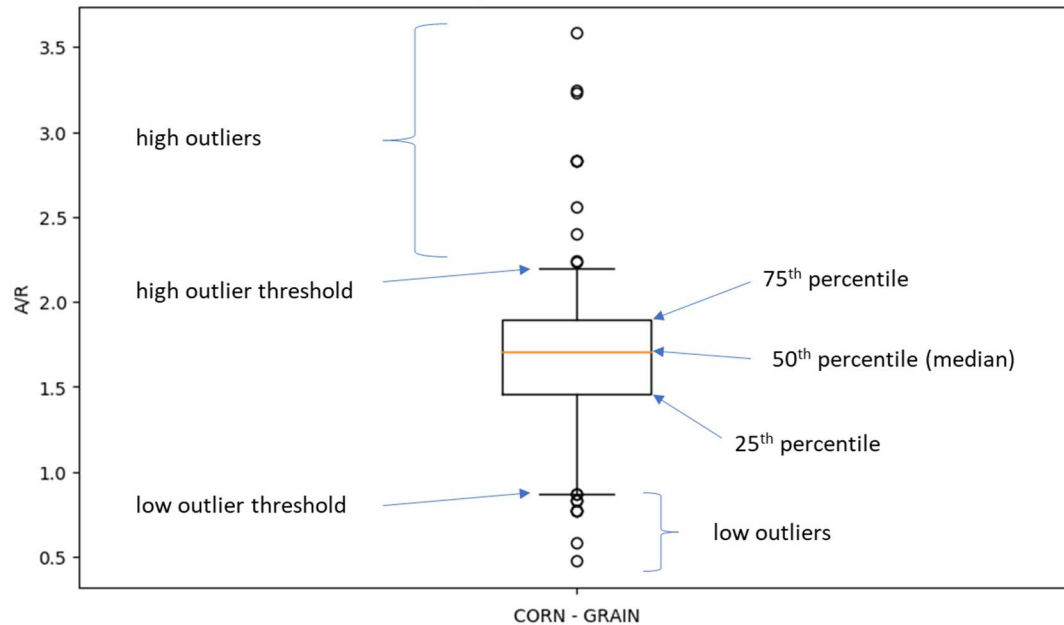


Figure 2. Interpretation diagram for box and whisker plot.

3.6.3 SOIL TYPE EVALUATION

Soil drainage class was selected to further evaluate outlier status at the Coalition level for each crop type. Soil drainage class refers to the frequency and duration of wet periods under conditions similar to those under which the soil developed. Anthropogenic alteration of the water regime, either through drainage or irrigation, is not a consideration unless the alterations have significantly changed the morphology of the soil. Soil drainage class was obtained from the dominant condition in the SSURGO dataset for the map unit with largest overlap assigned to each parcel. The drainage classes were then aggregated into four classes:

1. Well Drained
 - Excessively Drained
 - Somewhat Excessively Drained
 - Well Drained
2. Moderately Well Drained
3. Somewhat Poorly Drained
4. Poorly Drained
 - Poorly Drained
 - Very Poorly Drained

The influence of soil drainage class on A/R values for each crop was assessed using a Kruskal-Wallis one-way analysis of variance (ANOVA). This is a non-parametric test that evaluates (for each crop type) the hypothesis that all drainage classes have the same mean A/R values. A result was considered statistically significant for p -values < 0.05 . If a significant result was obtained for a given crop, a follow-up test was completed using Dunn's test, a non-parametric multiple comparisons test, to identify which of the

drainage classes were significantly different from each other. The Dunn's test p -values were adjusted for error using the Bonferroni adjustment. The soil type evaluation was not performed for crops without R values or with a small number of observations. Results of the soil type evaluation are provided in Section 3.7.2.

3.6.4 IRRIGATION TYPE EVALUATION

Irrigation method was collected as part of the INMP reporting requirements in 2021 for the 2020 CY, so the A/R evaluation by irrigation type begins with this report. Data was collected on primary and secondary irrigation types. The influence of irrigation type on A/R values for each crop was assessed using a Kruskal-Wallis one-way analysis of variance (ANOVA). This is a non-parametric test that evaluates (for each crop type) the hypothesis that all irrigation types have the same mean A/R values. A result was considered statistically significant for p -values < 0.05 . Dunn's test was performed for any crops with a significant effect to identify which irrigation methods were significantly different from each other. The Dunn's test p -values were adjusted for error using the Bonferroni adjustment. The irrigation type evaluation was not performed for crops without R values or with a small number of observations. Results of the irrigation type evaluation are provided in Section 3.7.3.

3.7 INMP RESULTS

3.7.1 INMP STATISTICAL ANALYSIS RESULTS

The crop acreages from the INMP Summary Reports included in the statistical analysis are shown in Figure 3. The largest acreage crop reported was almonds, followed by walnuts and wine grapes. The crop acreage and number of fields are further summarized in Table 9 by records that were (1) analyzed, (2) non-bearing or zero yield, or (3) exempt or questionable data. Boxplots of the yield and N applied for the analyzed fields are shown in Figure 4 and Figure 5, respectively, for the largest acreage crops within the Coalition. The yield and N applied for some crop types varied by several orders of magnitude.

The A/R and A-R summary statistics, histograms, box and whisker plots, and number of outliers for each crop type analyzed are provided in Appendix A.

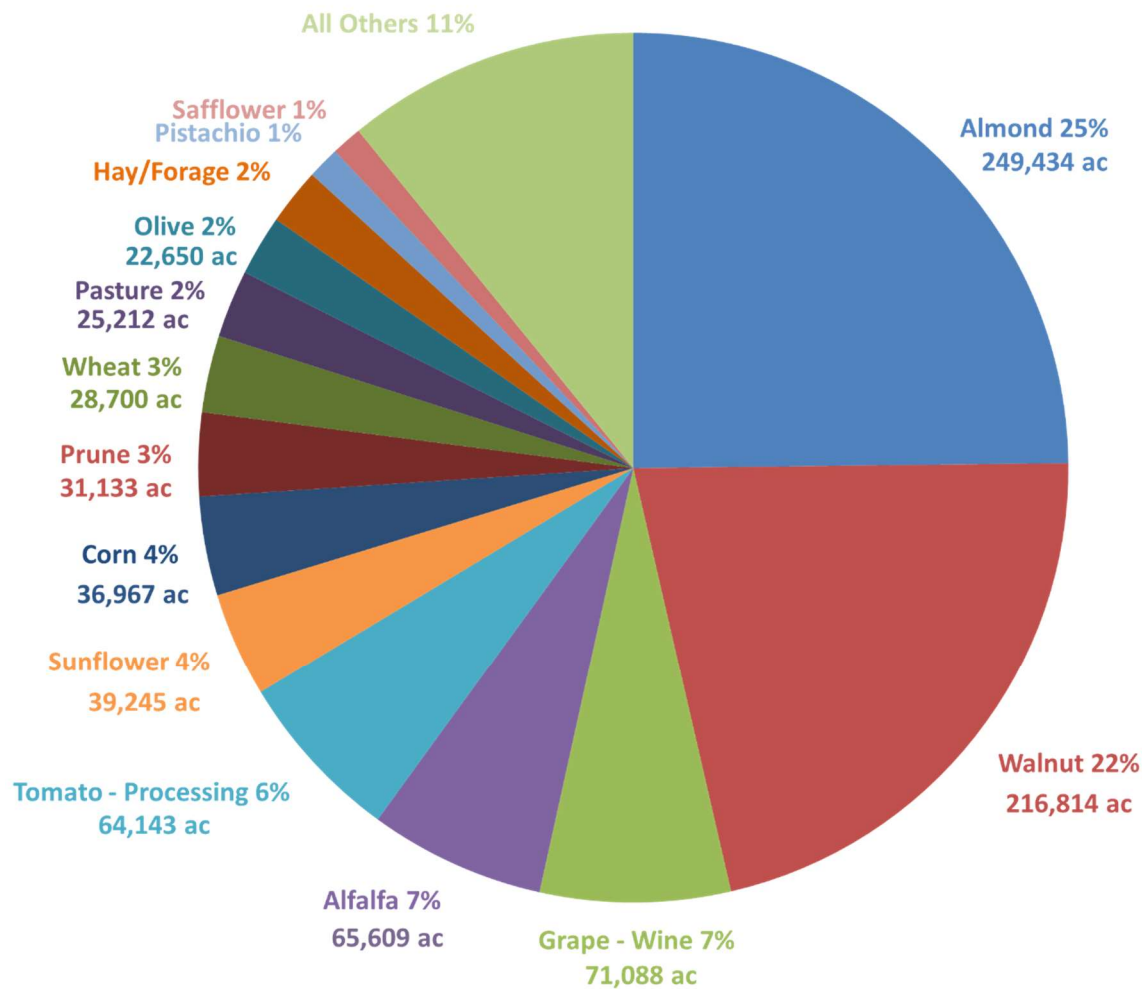


Figure 3. Crop acreage totals for submitted INMP summary reports.

Notes: Excludes incomplete records or fields that were not required to report (e.g. non-irrigated)

Table 9. Summary of crops reported on INMP summary reports.

Crop	Analyzed		Excluded - Non-Bearing or Zero Yield		Excluded - Exempt or Questionable Data	
	Number of Fields	Acres	Number of Fields	Acres	Number of Fields	Acres
Alfalfa - Greenchop	1	48	0	0	0	0
Alfalfa – Hay	1,147	59,677	121	5,729	4	365
Alfalfa – Silage/Haylage	5	150	0	0	0	0
Almond	4,391	220,713	663	28,713	8	256
Apple	28	407	16	60	2	26
Apricot/Aprium	8	14	5	3	0	0
Aquaculture	0	0	0	0	13	899
Asparagus	7	226	4	65	5	42
Barley – Grain	28	1,097	1	26	0	0
Barley – NR	17	913	1	1	0	0
Bean – Green	9	583	0	0	0	0
Bean Dry	228	10,192	6	201	0	0

Crop	Analyzed		Excluded - Non-Bearing or Zero Yield		Excluded - Exempt or Questionable Data	
	Number of Fields	Acres	Number of Fields	Acres	Number of Fields	Acres
Beet	0	0	1	0.5	0	0
Berry	19	85	10	26	0	0
Cabbage	2	11	2	22	1	38
Cherry	36	1,409	22	87	1	2
Chestnut	10	78	0	0	0	0
Christmas Tree	19	136	12	109	0	0
Cilantro	1	88	0	0	0	0
Citrus	61	462	24	141	3	2
Corn – Fodder/Silage	140	7,402	20	965	0	0
Corn – Grain	454	27,974	6	316	0	0
Corn – NR	8	233	9	77	0	0
Corn – Popcorn	11	526	0	0	0	0
Corn – Sweet	13	413	0	0	0	0
Cotton	22	1,881	0	0	0	0
Cover Crop	5	7	37	1,280	0	0
Cucumber	62	2,353	0	0	0	0
Dichondra	6	264	0	0	0	0
Eggplant	2	1	0	0	0	0
Fallow	0	0	0	0	83	332
Fig	12	187	0	0	0	0
Filbert/Hazelnut	0	0	1	0.5	0	0
Flower/Ornamental	6	341	13	53	0	0
Garlic	5	332	0	0	0	0
Grain Hay	17	678	7	93	0	0
Grape – Other	10	179	3	10	1	5
Grape – Table	3	13	1	2	0	0
Grape – Wine	1,297	64,919	221	6,159	10	253
Grape Rootstock	7	224	11	245	0	0
Greenhouse	0	0	2	4	0	0
Hay/Forage	367	18,011	84	3,077	9	573
Hemp	4	20	1	80	0	0
Herb/Spice	1	14	4	26	0	0
Hops	3	19	5	4	0	0
Kale	0	0	1	8	0	0
Kiwi	68	1,422	11	367	0	0
Lavender	2	3	2	0.6	0	0
Leek	0	0	1	0.3	0	0
Lettuce	0	0	1	0.3	0	0
Melon	11	922	4	42	0	0
Millet – NR	2	176	0	0	0	0
Mint	3	282	0	0	0	0
Misc Field Crops	7	245	2	156	0	0
Misc Fruit Tree	129	2,610	45	617	1	0.60
Misc Nut Tree	8	123	0	0	0	0
Misc Row Crop	48	3,283	8	291	0	0
Misc Vegetable	78	1,475	14	76	1	1

Crop	Analyzed		Excluded - Non-Bearing or Zero Yield		Excluded - Exempt or Questionable Data	
	Number of Fields	Acres	Number of Fields	Acres	Number of Fields	Acres
Non-Irrigated Crop	0	0	0	0	11	402
Nursery	10	81	24	431	0	0
Oat – Grain	8	361	0	0	0	0
Oat – Hay	58	2,285	11	426	0	0
Oat – NR	3	125	0	0	0	0
Oat – Silage	3	77	0	0	0	0
Okra	2	103	0	0	0	0
Olive	511	18,147	199	4,493	10	428
Onion	2	84	2	10	0	0
Orchard Grass – Hay	56	3,442	0	0	1	99
Other	11	217	27	1,852	13	325
Pasture	196	16,218	171	6,892	2,102	101,673
Peach/Nectarine	371	8,361	16	143	2	3
Pear	185	6,202	16	116	3	64
Pecan	55	1,554	41	927	0	0
Pepper	24	1,038	1	4	0	0
Persimmon	27	308	7	42	0	0
Pistachio	125	7,014	78	5,088	2	424
Plum/Pluot	60	1,842	9	90	1	19
Pomegranate	1	20	6	40	2	6
Potato	6	365	0	0	0	0
Prune	784	27,057	107	4,071	5	200
Pumpkin	15	235	2	3	0	0
Rangeland	0	0	2	21	0	0
Research	2	71	31	203	0	0
Rice	0	0	0	0	54	4,096
Rice – Wild	76	6,178	3	3	2	90
Ryegrass – Hay	29	1,161	2	35	0	0
Ryegrass – NR	24	865	5	194	0	0
Ryegrass – Silage/Haylage	3	66	0	0	0	0
Safflower	236	10,891	12	470	2	50
Seed Crop	86	2,624	18	188	6	491
Sorghum/Milo – Grain	26	937	0	0	0	0
Sorghum/Milo – NR	30	1,178	4	200	0	0
Squash	8	179	3	11	1	50
Strawberry	13	295	9	33	0	0
Sudan Grass – Greenchop	7	125	0	0	0	0
Sudan Grass – Hay	98	7,998	0	0	0	0
Sudan Grass – NR	13	1,284	0	0	0	0
Sudan Grass – Silage	7	241	0	0	0	0
Sunflower	724	38,632	14	610	3	165
Tomatillo	0	0	1	4	0	0
Tomato – Fresh Market	3	58	1	8	2	0.38
Tomato – NR	10	511	1	0.6	2	118
Tomato – Processing	1,234	63,756	18	385	2	52
Triticale – Grain	87	4,286	0	0	0	0

Crop	Analyzed		Excluded - Non-Bearing or Zero Yield		Excluded - Exempt or Questionable Data	
	Number of Fields	Acres	Number of Fields	Acres	Number of Fields	Acres
Triticale – Hay	10	326	0	0	0	0
Triticale – NR	34	1,592	1	132	0	0
Turf	7	563	3	205	0	0
Turnip	1	8	0	0	0	0
Vetch	5	130	15	750	0	0
Vine Seed	209	7,023	11	322	4	58
Walnut	5,045	194,106	615	22,672	36	1,009
Watermelon	11	531	3	25	0	0
Wheat – Grain	175	9,742	8	173	0	0
Wheat – Greenchop	1	99	0	0	0	0
Wheat – Hay	29	3,014	0	0	0	0
Wheat – NR	302	15,375	9	199	0	0
Wheat – Silage	2	97	0	0	0	0
Winter Grain	6	118	0	0	0	0
Winter Vegetable	1	0.1	0	0	0	0

Notes:

Excludes incomplete records or fields that were not required to report (e.g. non-irrigated)

NR - specific crop type not reported. A/R and A-R could not be calculated for this category.

Grouped Boxplot by Crop

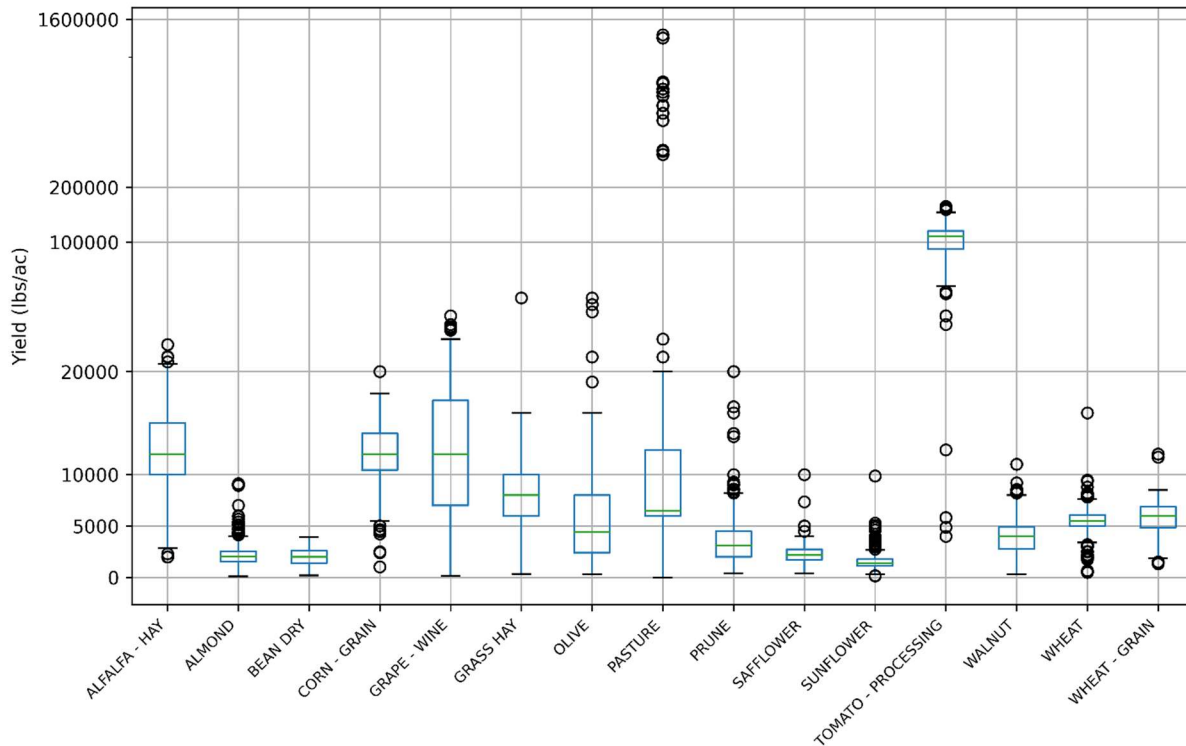


Figure 4. Box and whisker plot showing the yield per acre for the highest acreage crops.

Grouped Boxplot by Crop

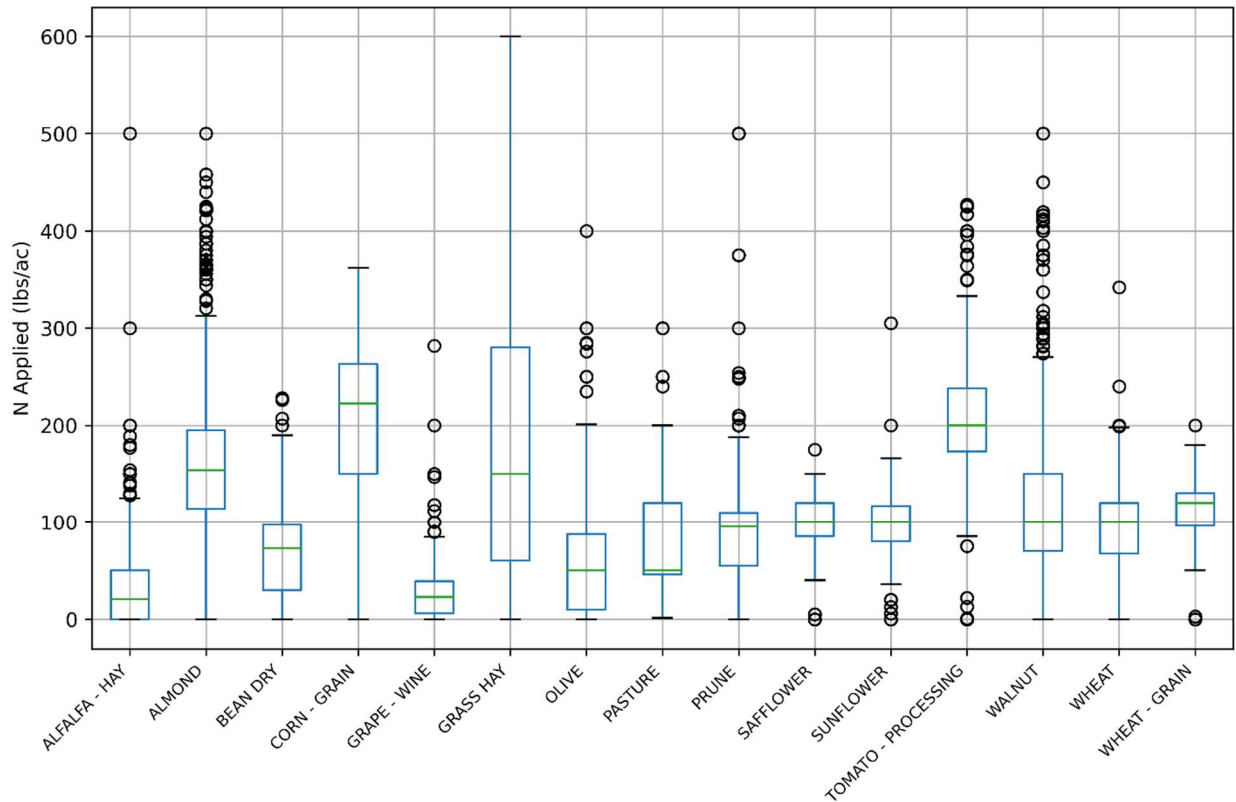


Figure 5. Box and whisker plot showing the N applied per acre for the highest acreage crops.

3.7.2 SOIL TYPE EVALUATION RESULTS

Sixteen crop types were included in the soil type evaluation, with the remaining crops either not having enough observations or not having R values. Results are shown in Table 10. Twelve of the sixteen crops had p -values less than 0.05, which indicate a significant effect: alfalfa – hay, bean dry, corn – grain, grape – wine, hay/forage, olive, pear, prune, sunflower, tomato – processing, walnut, and wheat – grain. The multiple comparisons test (Dunn’s test) to evaluate which drainage classes were significantly different from each other is shown in Table 11. Red highlighted p -values are less than 0.05, indicating a significant effect.

For the crops with a significant effect, the drainage classes with the highest mean A/R varied by crop. Six of the twelve crops had the highest mean A/R for moderately well drained soils; however, some of these were not significantly different from other classes, and there no was no clear trend of soil wetness effect on A/R. For example, for walnuts the well drained soils had significantly lower A/R than the other three drainage classes, while for wine grapes, well drained and moderately well drained soils had significantly higher A/R compared to the other two drainage classes.

Table 10. Evaluation of soil drainage class effect on A/R.

Crop	Drainage Class	No. of Fields	Mean A/R	p-value
Alfalfa - Hay	Well	295	0.10	<.0001
	Moderately well	321	0.12	
	Somewhat poorly	172	0.08	
	Poorly	258	0.06	
Almond	Well	3017	1.05	0.1498
	Moderately well	684	1.17	
	Somewhat poorly	324	0.97	
	Poorly	115	1.12	
Bean Dry	Well	76	1.25	0.0328
	Moderately well	68	1.38	
	Somewhat poorly	47	0.78	
	Poorly	26	0.96	
Corn - Grain	Well	108	1.55	<.0001
	Moderately well	77	2.00	
	Somewhat poorly	118	1.67	
	Poorly	138	1.20	
Grape - Wine	Well	604	2.25	<.0001
	Moderately well	167	1.36	
	Somewhat poorly	205	1.07	
	Poorly	249	1.14	
Hay/Forage	Well	79	0.41	0.0085
	Moderately well	142	0.56	
	Somewhat poorly	29	0.41	
	Poorly	45	0.73	
Olive	Well	447	7.73	0.0019
	Moderately well	21	3.80	
	Somewhat poorly	11	5.56	
	Poorly	17	8.71	
Peach/Nectarine	Well	97	9.91	0.3722
	Moderately well	236	9.34	
	Somewhat poorly	9	6.07	
	Poorly	2	1.38	
Pear	Well	13	2.85	0.0391
	Moderately well	13	6.71	
	Somewhat poorly	77	12.48	
	Poorly	80	14.19	
Pistachio	Well	73	10.20	0.2656
	Moderately well	16	7.43	
	Somewhat poorly	25	11.16	
	Poorly	5	4.99	
Prune	Well	372	5.82	<.0001
	Moderately well	283	10.22	
	Somewhat poorly	56	5.99	
	Poorly	39	9.46	

Crop	Drainage Class	No. of Fields	Mean A/R	p-value
Safflower	Well	42	1.53	0.4457
	Moderately well	15	1.92	
	Somewhat poorly	47	1.86	
	Poorly	130	2.06	
Sunflower	Well	332	2.48	0.0317
	Moderately well	141	2.66	
	Somewhat poorly	122	2.58	
	Poorly	105	2.17	
Tomato - Processing	Well	564	1.44	0.0004
	Moderately well	164	1.50	
	Somewhat poorly	230	1.56	
	Poorly	209	1.35	
Walnut	Well	2683	1.90	<.0001
	Moderately well	1209	2.36	
	Somewhat poorly	761	2.41	
	Poorly	129	2.96	
Wheat - Grain	Well	53	1.02	0.0140
	Moderately well	36	1.22	
	Somewhat poorly	44	0.85	
	Poorly	34	1.13	

Table 11. Multiple comparisons test of soil drainage classes for crop types with a significant effect of drainage class on A/R.

Crop	Drainage Class	p-value for Drainage Class Comparison			
		Poorly	Somewhat Poorly	Moderately Well	Well
Alfalfa - Hay	Well	0.001	0.548	<.001	1
	Moderately well	<.001	<.001	1	<.001
	Somewhat poorly	0.571	1	<.001	0.548
	Poorly	1	0.571	<.001	0.001
Bean Dry	Well	1	0.054	1	1
	Moderately well	1	0.059	1	1
	Somewhat poorly	1	1	0.059	0.054
	Poorly	1	1	1	1
Corn - Grain	Well	<.001	1	0.007	1
	Moderately well	<.001	0.131	1	0.007
	Somewhat poorly	<.001	1	0.131	1
	Poorly	1	<.001	<.001	<.001
Grape - Wine	Well	0.007	<.001	1	1
	Moderately well	0.021	0.002	1	1
	Somewhat poorly	1	1	0.002	<.001
	Poorly	1	1	0.021	0.007
Hay/Forage	Well	0.017	0.777	0.023	1
	Moderately well	1	1	1	0.023
	Somewhat poorly	1	1	1	0.777
	Poorly	1	1	1	0.017

Crop	Drainage Class	<i>p</i> -value for Drainage Class Comparison			
		Poorly	Somewhat Poorly	Moderately Well	Well
Olive	Well	0.002	1	1	1
	Moderately well	0.005	0.902	1	1
	Somewhat poorly	0.919	1	0.902	1
	Poorly	1	0.919	0.005	0.002
Pear	Well	0.060	0.073	0.047	1
	Moderately well	1	1	1	0.047
	Somewhat poorly	1	1	1	0.073
	Poorly	1	1	1	0.060
Prune	Well	<.001	0.441	<.001	1
	Moderately well	1	0.665	1	<.001
	Somewhat poorly	0.264	1	0.665	0.441
	Poorly	1	0.264	1	<.001
Sunflower	Well	1	0.911	0.043	1
	Moderately well	0.156	1	1	0.043
	Somewhat poorly	1	1	1	0.911
	Poorly	1	1	0.156	1
Tomato - Processing	Well	0.181	0.189	<.001	1
	Moderately well	0.494	0.391	1	<.001
	Somewhat poorly	1	1	0.391	0.189
	Poorly	1	1	0.494	0.181
Walnut	Well	0.014	<.001	<.001	1
	Moderately well	1	1	1	<.001
	Somewhat poorly	1	1	1	<.001
	Poorly	1	1	1	0.014
Wheat - Grain	Well	0.956	0.356	1	1
	Moderately well	1	0.099	1	1
	Somewhat poorly	0.014	1	0.099	0.356
	Poorly	1	0.014	1	0.956

Notes:

Red highlighted *p*-values are <0.05

3.7.3 IRRIGATION TYPE EVALUATION RESULTS

Seventeen crop types were included in the irrigation type evaluation, with the remaining crops either not having enough observations or not having R values. Most of the crops tested have multiple irrigation methods that the majority of the fields fall within. The less common irrigation methods for most crops generally have a small number of observations, some less than five, which is generally considered too small of a sample size for the Kruskal-Wallis test.

Results are shown in Table 12. *P*-values less than 0.05, which indicate a significant effect, occurred for 13 of the 17 crops: alfalfa – hay, almond, bean dry, corn – grain, grape – wine, hay/forage, peach/nectarine, prune, sunflower, tomato – processing, triticale – grain, walnut, wheat – grain. The multiple comparisons test (Dunn’s test) to evaluate which drainage classes were significantly different from each other is shown in Table 13. Red highlighted *p*-values are less than 0.05, indicating a significant effect.

For the crops with a significant effect, the irrigation method with the highest mean A/R varied by crop with no clear trends. For almonds, 97% of the fields were either sprinkler, micro-sprinkler, or drip. Drip and micro-sprinkler had similar median A/R values and were not significantly different from each other, but sprinkler was significantly higher than both drip and micro-sprinkler. For walnuts, 90% of the fields were either sprinkler or micro-sprinkler and there was no significant difference between these two methods.

Table 12. Evaluation of irrigation type effect on A/R.

Crop	Irrigation Type	No. of Fields	Mean A/R	p-value
Alfalfa - Hay	Border Strip	126	0.05	<.0001
	Drip	10	0.00	
	Flood	628	0.11	
	Furrow	170	0.10	
	Micro Sprinkler	2	0.51	
	Sprinkler	209	0.09	
	Sub-Irrigation	1	0.00	
Almond	Border Strip	6	1.49	<.0001
	Drip	1694	0.99	
	Flood	47	0.93	
	Furrow	2	0.85	
	Micro Sprinkler	1600	1.09	
	Sprinkler	975	1.08	
	Sub-Irrigation	67	2.52	
Bean Dry	Drip	51	1.09	0.0097
	Flood	4	6.36	
	Furrow	148	1.14	
	Sprinkler	22	0.54	
	Sub-Irrigation	3	0.59	
Corn - Fodder/Silage	Border Strip	5	1.08	0.0870
	Drip	22	1.21	
	Flood	38	2.02	
	Furrow	69	1.23	
	Micro Sprinkler	1	3.54	
	Sprinkler	1	0.53	
	Sub-Irrigation	4	0.83	
Corn - Grain	Border Strip	3	1.20	<.0001
	Drip	103	1.61	
	Flood	35	1.49	
	Furrow	241	1.56	
	Sprinkler	16	2.62	
	Sub-Irrigation	53	1.09	
Grape - Wine	Drip	1248	1.70	0.0001
	Flood	5	0.93	
	Furrow	16	0.67	
	Micro Sprinkler	13	1.65	
	Sprinkler	13	0.55	

Crop	Irrigation Type	No. of Fields	Mean A/R	p-value
Hay/Forage	Border Strip	28	0.45	0.0123
	Drip	2	0.71	
	Flood	226	0.57	
	Furrow	38	0.29	
	Micro Sprinkler	2	1.50	
	Sprinkler	58	0.81	
	Sub-Irrigation	3	2.20	
Olive	Border Strip	1	5.31	0.5368
	Drip	376	5.65	
	Flood	71	19.95	
	Furrow	2	0.00	
	Micro Sprinkler	42	7.11	
	Sprinkler	16	6.54	
	Sub-Irrigation	1	3.45	
Peach/Nectarine	Border Strip	4	3.24	<.0001
	Drip	26	11.47	
	Flood	15	2.22	
	Micro Sprinkler	286	7.14	
	Sprinkler	40	28.85	
Pear	Border Strip	1	3.45	0.9264
	Drip	10	6.45	
	Flood	31	8.82	
	Micro Sprinkler	10	10.88	
	Sprinkler	133	13.40	
Prune	Border Strip	7	11.09	0.0001
	Drip	186	4.58	
	Flood	74	6.30	
	Micro Sprinkler	426	9.40	
	Sprinkler	90	5.77	
	Sub-Irrigation	1	4.46	
Safflower	Drip	19	1.52	0.0641
	Flood	13	1.62	
	Furrow	83	2.08	
	Micro Sprinkler	1	0.97	
	Sprinkler	48	1.81	
	Sub-Irrigation	14	1.96	
Sunflower	Drip	377	2.17	<.0001
	Flood	18	2.44	
	Furrow	304	2.89	
	Sprinkler	17	2.31	
	Sub-Irrigation	7	3.14	
Tomato - Processing	Drip	928	1.40	<.0001
	Flood	10	0.71	
	Furrow	232	1.59	
	Sprinkler	57	1.61	
	Sub-Irrigation	7	1.50	

Crop	Irrigation Type	No. of Fields	Mean A/R	p-value
Triticale - Grain	Border Strip	5	0.00	0.0014
	Drip	2	1.01	
	Flood	11	1.12	
	Furrow	33	0.87	
	Sprinkler	19	0.87	
	Sub-Irrigation	17	1.00	
Walnut	Border Strip	21	1.85	<.0001
	Drip	179	2.77	
	Flood	223	2.27	
	Furrow	28	1.83	
	Micro Sprinkler	2177	2.30	
	Sprinkler	2406	1.94	
	Sub-Irrigation	8	1.36	
Wheat - Grain	Border Strip	24	1.13	0.0008
	Drip	7	0.79	
	Flood	43	1.22	
	Furrow	78	0.97	
	Sprinkler	17	0.75	
	Sub-Irrigation	6	1.32	

Table 13. Multiple comparisons test of irrigation types for crop types with a significant effect of irrigation type on A/R.

Crop	Irrigation	p-value for Irrigation Comparison						
		Border	Drip	Flood	Furrow	Micro	Sprinkler	Sub
Alfalfa - Hay	Border	1	0.824	<.001	<.001	1	1	1
	Drip	0.824	1	0.003	<.001	0.237	0.123	1
	Flood	<.001	0.003	1	0.978	1	0.002	1
	Furrow	<.001	<.001	0.978	1	1	<.001	1
	Micro	1	0.237	1	1	1	1	1
	Sprinkler	1	0.123	0.002	<.001	1	1	1
	Sub	1	1	1	1	1	1	1
Almond	Border	1	0.080	0.086	0.979	0.145	0.570	1
	Drip	0.080	1	1	1	0.500	<.001	<.001
	Flood	0.086	1	1	1	1	0.476	<.001
	Furrow	0.979	1	1	1	1	1	1
	Micro	0.145	0.500	1	1	1	<.001	<.001
	Sprinkler	0.570	<.001	0.476	1	<.001	1	0.001
	Sub	1	<.001	<.001	1	<.001	0.001	1
Bean Dry	Drip		1	0.888	1		0.111	1
	Flood		0.888	1	0.877		0.048	0.413
	Furrow		1	0.877	1		0.035	1
	Sprinkler		0.111	0.048	0.035		1	1
	Sub		1	0.413	1		1	1

Crop	Irrigation	p-value for Irrigation Comparison						
		Border	Drip	Flood	Furrow	Micro	Sprinkler	Sub
Corn - Grain	Border	1	1	1	1		1	1
	Drip	1	1	1	1		0.344	<.001
	Flood	1	1	1	0.416		1	0.010
	Furrow	1	1	0.416	1		0.059	<.001
	Sprinkler	1	0.344	1	0.059		1	1
	Sub	1	<.001	0.010	<.001		1	1
Grape - Wine	Drip			1	0.381	0.124	0.003	
	Flood		1	1	1	1	1	
	Furrow		0.381	1	1	1	1	
	Micro		0.124	1	1	1	1	
	Sprinkler		0.003	1	1	1	1	
Hay/Forage	Border	1	1	1	1	0.432	1	1
	Drip	1	1	1	1	1	1	1
	Flood	1	1	1	0.125	0.622	1	1
	Furrow	1	1	0.125	1	0.109	0.079	1
	Micro	0.432	1	0.622	0.109	1	1	1
	Sprinkler	1	1	1	0.079	1	1	1
	Sub	1	1	1	1	1	1	1
Peach/Nectarine	Border	1	1	1		1	0.757	
	Drip	1	1	0.070		1	0.024	
	Flood	1	0.070	1		0.187	<.001	
	Micro	1	1	0.187		1	<.001	
	Sprinkler	0.757	0.024	<.001		<.001	1	
Prune	Border	1	0.020	0.250		0.387	0.144	1
	Drip	0.020	1	0.513		<.001	1	1
	Flood	0.250	0.513	1		1	1	1
	Micro	0.387	<.001	1		1	1	1
	Sprinkler	0.144	1	1		1	1	1
	Sub	1	1	1		1	1	1
Sunflower	Drip		1	1	<.001		1	0.189
	Flood		1	1	1		1	1
	Furrow		<.001	1	1		1	1
	Sprinkler		1	1	1		1	1
	Sub		0.189	1	1		1	1
Tomato - Processing	Drip		1	0.006	0.115		<.001	1
	Flood		0.006	1	0.001		<.001	0.017
	Furrow		0.115	0.001	1		0.028	1
	Sprinkler		<.001	<.001	0.028		1	1
	Sub		1	0.017	1		1	1

Crop	Irrigation	p-value for Irrigation Comparison						
		Border	Drip	Flood	Furrow	Micro	Sprinkler	Sub
Triticale - Grain	Border	1	0.312	<.001	0.030		0.011	0.083
	Drip	0.312	1	1	1		1	1
	Flood	<.001	1	1	0.248		1	0.284
	Furrow	0.030	1	0.248	1		1	1
	Sprinkler	0.011	1	1	1		1	1
	Sub	0.083	1	0.284	1		1	1
Walnut	Border	1	1	1	1	1	1	1
	Drip	1	1	1	0.029	<.001	<.001	0.285
	Flood	1	1	1	0.138	0.005	<.001	0.600
	Furrow	1	0.029	0.138	1	1	1	1
	Micro	1	<.001	0.005	1	1	0.293	1
	Sprinkler	1	<.001	<.001	1	0.293	1	1
	Sub	1	0.285	0.600	1	1	1	1
Wheat - Grain	Border	1	1	1	1		1	1
	Drip	1	1	0.081	1		1	1
	Flood	1	0.081	1	0.001		0.116	1
	Furrow	1	1	0.001	1		1	1
	Sprinkler	1	1	0.116	1		1	1
	Sub	1	1	1	1		1	1

Notes:

Red highlighted p-values are <0.05

3.8 INMP ANALYSIS CONCLUSIONS

The overall member completion percentage for INMP Summary Reports for the 2020 CY was slightly lower than the 2019 CY. This was due to members in low vulnerability areas, including five Subwatersheds with only low vulnerability areas, having to report for the first time. There was also an increase in reporting errors for the members reporting via paper forms because a majority of these members reported for the first time. Common errors identified during the review process included incomplete data, unreasonable values for yield or N applied, incorrect yield units, or missing/incorrect yield basis if different than the standard. For members reporting electronically, data quality was generally improved compared to the 2019 CY.

Soil type, as represented by drainage class, had a significant effect on the mean A/R values in the following crops: alfalfa – hay, bean dry, corn – grain, grape – wine, hay/forage, olive, pear, prune, sunflower, tomato – processing, walnut, wheat – grain; however, the drainage classes that had significantly higher A/R values varied by crop with no clear trends.

Irrigation type had a significant effect on the mean A/R values in the following crops: alfalfa – hay, almond, bean dry, corn – grain, grape – wine, hay/forage, peach/nectarine, prune, sunflower, tomato – processing, triticale – grain, walnut, wheat – grain. For the crops with a significant effect, there was no irrigation method that stood out as having consistently higher A/R values across multiple crop types.

3.9 MEMBER FEEDBACK AND OUTREACH

Member outreach is expected to occur in winter 2021. Outreach activities will include individualized feedback reports sent to each member in the Coalition who submitted N application and yield data. The reports will include a table showing individual values for each member’s fields and Coalition averages for N applied, A/R, and A-R. An example of an individual member feedback report is provided in Appendix C.

The member feedback report is designed to show N use efficiency for the member’s fields within the context of other members in the Coalition. Members are also encouraged to contact the Coalition if they identify any incorrectly reported values that were not identified during the data review process.

4 SUMMARY OF ANNUAL MANAGEMENT PRACTICE INFORMATION

This section summarizes the management practice information collected through the FE, INMP Summary Reports, and MPIR for the 2020 CY.

4.1 INMP MANAGEMENT PRACTICES

The annual management practice implementation data collected through the INMP Summary Reports (irrigation method, irrigation efficiency practices, and N efficiency practices) are summarized below and provided in Attachment 1 (Excel workbook format).

4.1.1 IRRIGATION METHOD

For primary irrigation method, drip was the most common, comprising 30% of the acres and 28% of the fields where irrigation type was reported. Micro-sprinkler, flood, and sprinkler were the next most common with all at approximately 20% of the acres for records with irrigation type reported. Furrow irrigation represented 8% of the acres, border strip represented 2%, and sub-irrigation represented 1%.

Table 14. Irrigation method summary.

Irrigation Type	Primary Method		Secondary Method	
	Acres	Fields	Acres	Fields
Drip	328,178	6,923	41,797	945
Micro Sprinkler	235,712	5,724	31,236	702
Furrow	89,614	1,976	7,289	150
Sprinkler	199,593	5,416	48,910	1,127
Border Strip	18,097	346	4,667	106
Flood	215,838	4,265	27,494	655
Sub-irrigation	15,650	234	1,268	39

4.1.2 IRRIGATION AND NITROGEN EFFICIENCY PRACTICES

The most reported N efficiency practices by members in 2020 included fertigation, soil nutrient testing, and petiole tissue testing (Table 15). Cover crops are not practical on every field, and variable rate fertilization requires specialized equipment, data, and interpretation to execute.

Irrigation management efficiency practices are shown in Table 16. This data reflects the increasing availability and data accessibility of technologies to improve irrigation efficiency such as drip irrigation, laser leveling, ET-based irrigation scheduling, and the use of moisture probes.

Table 15. N management efficiency practices reported by members for 2020 CY.

N Efficiency Practice	Irrigated Crop Acreage	Number of Fields
Cover crops	243,353	5,855
Fertigation	522,991	10,386
Foliar N applications	278,749	5,707
Irrigation water N testing	414,101	7,778
Soil nutrient testing	721,326	14,721
Petiole tissue	619,214	13,236
Variable rate fertilizer application	18,602	286

Table 16. Irrigation management efficiency practices reported by members for 2020 CY.

Irrigation Efficiency Practice	Irrigated Crop Acreage	Number of Fields
Laser leveling	581,784	12,082
Use of ET in irrigation scheduling	528,957	10,542
Water application scheduled to need	1,022,013	22,965
Use of moisture probe	430,790	8,862
Soil moisture neutron probe	81,280	1,822
Pressure bomb	251,185	4,975

4.2 FARM EVALUATION

The RWQCB reviews management practices compiled in this FE Summary, along with water quality monitoring results, to determine if Coalition members are taking actions to protect surface and groundwater quality beneficial uses. The standard FEs are designed to collect management practice information in four survey “Parts”:

- Section 1: whole farm evaluation
- Section 2: irrigation well information
- Section 3: sediment and erosion control practices
- Section 4: farm map (kept on-site by member)

The survey parts gather information on management practices that affect both surface and groundwater quality:

1. Identification of crops grown and the irrigated acreage of each crop,
2. Geographical location of the member's farm,
3. Identification of on-farm management practices implemented to achieve the WDR farm management performance standards,
4. Identification of whether there is movement of soil during storm events and/or during irrigation (sediment and erosion risk),
5. Location of active irrigation wells and abandoned wells, and
6. Applied wellhead protection and backflow prevention practices and devices.

The FE is required to be completed by all members, with the exception of managed wetlands and members of the Goose Lake Subwatershed, which received exemptions from the FE reporting requirements on August 13 and October 15, 2021, respectively. The Annual Management Practice Implementation Data for the FE is provided in Attachment 1 (Excel workbook format).

4.2.1 FE DATA COLLECTION AND QUALITY ASSESSMENT

Farm Evaluation data was reported online for the majority of the Coalition while the remainder was reported via paper forms that were manually entered into an excel template by Subwatershed staff. A summary of FEs returned is provided in Table 17. Out of all members required to submit FE surveys, 94% submitted them, which is estimated to account for 96% of crop acres and 97% of fields. The Order requires FEs to be summarized by township; however, township is not collected as part of the approved FE template. APN is provided by field for Section 3 of the FE, but county is not identified, so this data could not be reliably joined to county parcel data for spatial determination of township. Six of the Subwatersheds that use an online reporting system do have township information for the field portion of the FE (Section 3), but Sections 1 and 2 are tied to the members' whole operation which could span multiple townships.

Members were offered assistance with completing their surveys by each Subwatershed. Data were reviewed to identify data entry errors, missing data, and potentially inaccurate data. For members that reported online, the data was generally free from error due to validation checks during data entry; however, some members did not answer all the required questions. The data that was reported via paper forms had more errors, with common errors identified including the following:

- Not providing a response to all the required questions
- Duplicate entries
- Inconsistent member ID and member name in Sections 1, 2, and 3
- Not providing crop, acres, or APN for Section 3

The Coalition initially checked all returned forms for completeness and flagged any potential errors. Any FE data flagged during the review process was sent to the applicable Subwatershed for follow-up with the member. For members reporting online, corrections were made through the webtool by either the

member or Subwatershed staff. After the initial data flagging and review period, the dataset was reviewed a final time. The final dataset included some late submissions that were not captured during the initial review. Any remaining incomplete records were excluded from the results summary.

Table 17. Status of Farm Evaluations received.

FE Submission Status	Number of Members	Number of Fields	Acres
Not Submitted	432	1,059	32,367
Submitted	6,363	25,322	1,099,637

Notes:

The acreage and field count for reports not submitted is based on previous FE data, except for the Subwatersheds reporting via paper forms where this information was not available.

4.2.2 CROP SUMMARY

Crop type and irrigated acreage, which are reported on Section 3 of the FE, are summarized in Figure 6 and Table 18. The FE crop acreage percentages generally mirror the INMP data, with the exception of higher acreage for irrigated pasture, which was exempt from INMP reporting if no N was applied.

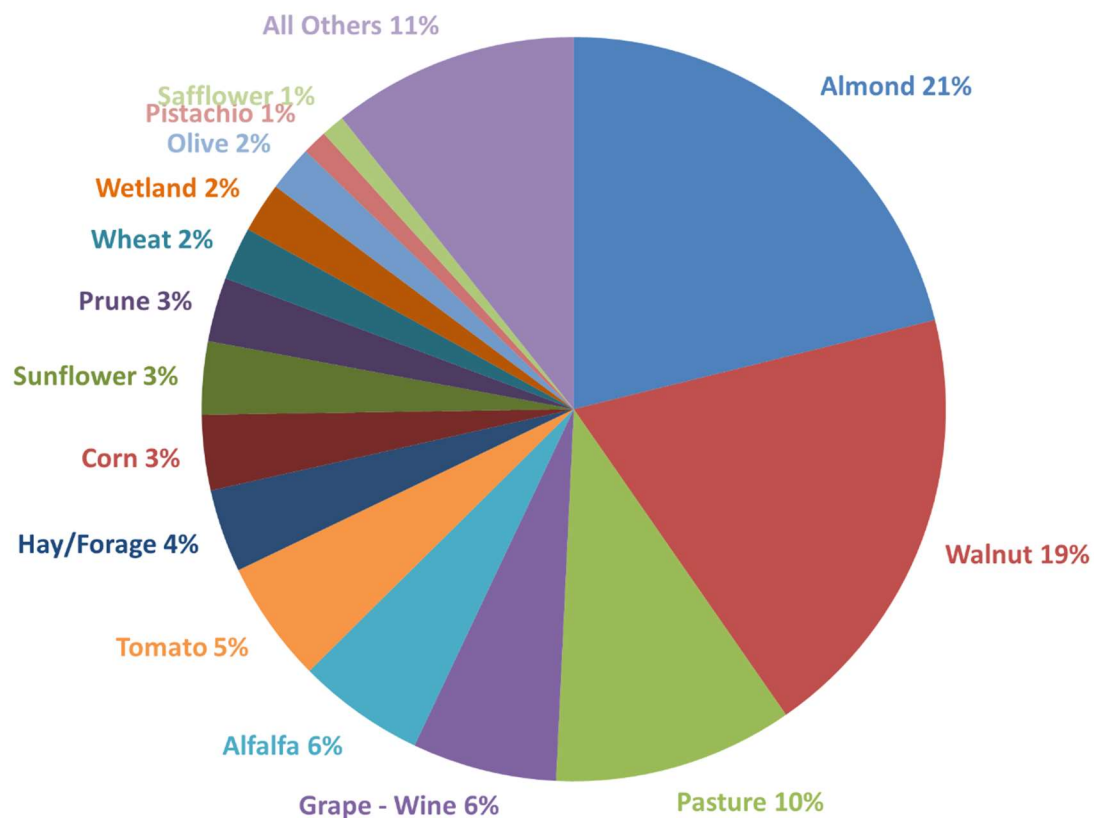


Figure 6. Crop acreage percentages for submitted FE reports.

Table 18. Acreage of crops with >1,000 acres for submitted FE reports.

Crop	Acres
Almond	243,118
Walnut	220,626
Pasture	119,787
Grape - Wine	72,207
Alfalfa	63,683
Tomato	60,928
Hay/Forage	41,507
Corn	37,626
Sunflower	36,440
Prune	32,074
Wheat	26,506
Wetland	25,039
Olive	22,816
Not Reported	12,487
Pistachio	12,450
Safflower	11,717
Sudan Grass	9,798
Peach/Nectarine	9,729
Bean Dry	9,713
Triticale	6,755
Pear	6,564
Vine Seed	6,079
Grass Hay	4,560
Rice	4,347
Misc Row Crop	3,617
Misc Fruit Tree	3,609
Oat	3,082
Cucumber	2,639
Ryegrass	2,524
Pecan	2,481
Sorghum/Milo	2,182
Other	2,169
Plum/Pluot	1,962
Cotton	1,881
Seed Crop	1,863
Barley	1,808

Crop	Acres
Kiwi	1,789
Cherry	1,497
Cover Crop	1,298
Watermelon	1,131
Pepper	1,040
Crops with < 1,000 acres	16,485

4.2.3 IRRIGATION PRACTICES SUMMARY

Irrigation practices for managing sediment and erosion reported by members in 2020 are summarized in Table 19. The most commonly used practices were drip irrigation, lengthened time between pesticide applications, and shorter irrigation runs. Several members also indicated no irrigation drainage due to field or soil conditions.

Table 19. Irrigation management practices reported by members for 2020 CY.

Irrigation Practice	Irrigated Crop Acres	Number of Members
In-furrow dams	134,769	798
Lengthened time between pesticide applications	761,792	3,728
Shorter irrigation runs	463,923	2,883
PAM	4,959	34
Drip	585,570	3,100
Flow dissipators	95,375	448
Tailwater return system	138,208	513
Catchment basin	113,551	718
No irrigation drainage	265,745	2,385
Other	35,031	280

4.2.4 SEDIMENT AND EROSION PRACTICES SUMMARY

For CY 2020, 5,882 members (93% of submitted reports) reported no sediment discharge from their fields, while 555 reported sediment discharge. Cultural practices to minimize erosion and sediment discharge reported by members are summarized in Table 20. The most commonly reported cultural practices to control erosion and sedimentation include amendments (to increase water penetration through soil), minimum tillage, and cover crops. Vegetated ditches and graded crop rows are also commonly used.

Table 20. Sediment and erosion management practices reported by members in 2020.

Sediment and Erosion Control Practice	Irrigated Crop Acres	Number of Members
Capture stormwater	320,020	1,563
Vegetated ditches	503,848	2,411
Vegetative filter strips	378,187	2,042
Sediment basins	127,002	711
Cover crops	593,923	3,721
Hedgerows	227,623	1,361
Use of amendments	710,629	2,823
Graded crop rows	477,824	2,019
Stabilized creek banks	225,069	1,019
Subsurface pipelines	156,805	601
Berms	263,500	1,386
Minimum tillage	685,645	3,938
Field at lower elevation than surrounding area	98,058	729
No storm drainage	200,211	2,184
Other	16,257	162

4.2.5 PESTICIDE MANAGEMENT PRACTICES SUMMARY

The most reported practices for pesticide management included following county permits and label instructions, avoiding surface water, and monitoring wind conditions and rain forecasts (Table 21). This data reflects members’ desires to ensure pesticide efficacy and efficiency.

Table 21. Pesticide management practices reported by members in 2020.

Pesticide Management Practice	Number of Members
No pesticides applied	1,685
County permit followed	4,705
Followed label instructions	4,714
Mapped sensitive areas	2,490
Attended trainings	4,126
Shut off end of row when spraying	4,147
Avoided surface water when spraying	4,279
Reapplied rinsate to treated field	2,200
Target sensing sprayer	463
Drift control agents	3,074
Monitored wind conditions	4,565
Used appropriate buffer zones	3,609

Pesticide Management Practice	Number of Members
Vegetated drain ditches	1,772
Monitored rain forecasts	4,312
Used PCA recommendations	4,308
Chemigation	570
Other	635

4.2.6 WELLS SUMMARY

For the 2020 CY, 4,462 members reported having no drinking water wells on their parcels, while 2,896 members reporting having drinking water wells, with a Coalition total of 4,445 drinking water wells.

Abandoned wells were reported by 172 members (totaling 213 wells), while 6,151 members reported no abandoned wells. For the abandonment methods for abandoned wells, 41 were reported as destroyed - certified by county, 56 – destroyed by a licensed professional, and 103 – destroyed by an unknown method. No details were reported on the remaining 13 wells.

Irrigation wells were reported by 3,712 members, with a Coalition total of 9,261 irrigation wells, while 2,610 members reported having no irrigation wells on their parcels. Irrigation wellhead protection practices reported by members in 2020 are summarized in Table 22. The following wellhead protection practices were utilized by more than 75% of all wells: good housekeeping practices, avoiding standing water around the wellhead, ground being sloped away from the wellhead, and cement pads.

Table 22. Wellhead protection practices reported by members in 2020.

Wellhead Protection Practice	Number of Members	Number of Irrigation Wells	Percent of Total Irrigation Wells
Cement pad	3,002	7,216	78%
Ground sloped away from wellhead	3,072	7,786	84%
Avoided standing water around wellhead	3,120	8,021	87%
Good housekeeping practices	3,525	8,838	95%
Air gap	1,071	2,585	28%
Backflow preventative	1,881	4,542	49%

4.3 MANAGEMENT PRACTICE IMPLEMENTATION REPORT

The MPIR is required to be completed by members in a surface water quality management plan (SQMP) or groundwater quality management plan (GQMP) area to identify management practices implemented by members to comply with the SQMP and GQMP requirements. The surface water management practices data will be summarized in the Coalition’s 2022 Annual Monitoring Report.

The groundwater management practice data for the 2020 CY consists of responses to eight questions from the FE and INMP templates, specified in the September 13, 2021 MPIR approval letter from the

RWQCB, which is filtered down to only members within HVAs. These practices are summarized for all members in Sections 4.1 and 4.2. In subsequent years, the groundwater MPIR data will also include data collected on irrigation distribution uniformity for members in HVAs. The annual management practice implementation data for the 2020 CY for the MPIR (surface water and groundwater) is included in Attachment 1 (Excel workbook format). The groundwater MPIR questions related to wells are provided on a separate tab since this information was collected on a whole farm level and was not tied spatially to individual fields.

5 ANNUAL INMP SUMMARY REPORT DATA

The annual INMP Summary Report data is provided in Attachment 2 (Excel workbook format) and is organized into the following three tables:

- Individual field-level AR data by anonymous member ID
- Individual field-level AR data by anonymous APN ID
- Township-level aggregated AR data table

In the township data table, fields that could not be mapped spatially have the township listed as “unknown”. For crops without N removal coefficients, A/R and A-R are blank since R could not be calculated. Outliers in the tables were determined using single-year A/R ratios because multi-year ratios are not available yet. Some fields have a different outlier status for A/R vs A-R, but only A/R outliers are identified in Attachment 2 and the member feedback reports.

6 REFERENCES

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- Tukey, J.W. 1977. Exploratory data analysis. Addison-Wesley, Reading MA.

APPENDICES

Appendix A: INMP Summary Statistics by Crop

Appendix B: Example INMP Member Feedback Report

Appendix C: INMP Statistical Groupings and Exclusion Thresholds by Crop

APPENDIX A

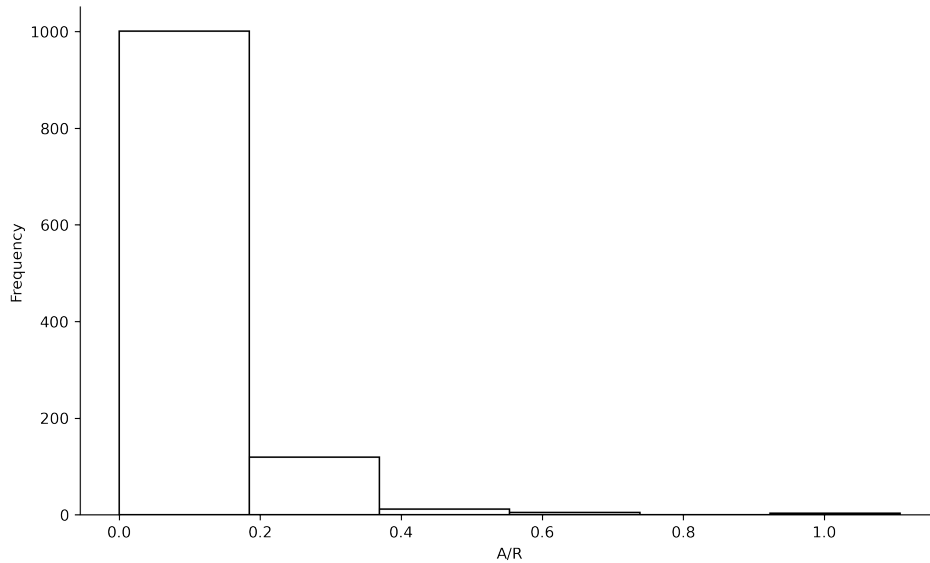
INMP SUMMARY STATISTICS BY CROP

1. ALFALFA - HAY

Table 1-1. Summary statistics for ALFALFA - HAY fields in Coalition.

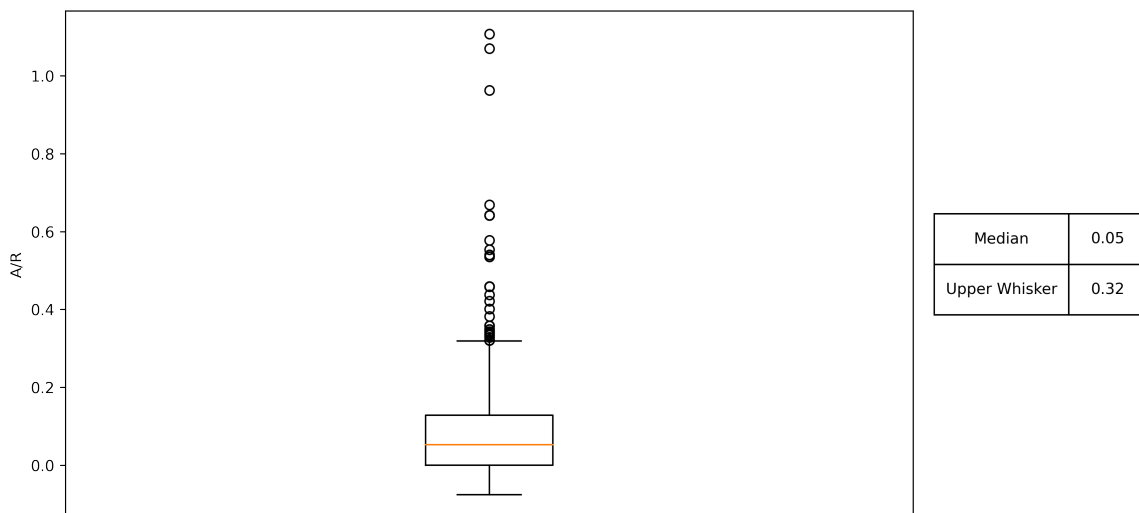
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	1147	59677.48	0.1	0.22	0.0	3.21	0.32	44
A-R	1147	59677.48	-356.96	132.71	-747.6	344.25	-95.99	55

Figure 1-1. Histogram of A/R for ALFALFA - HAY fields in the Coalition.



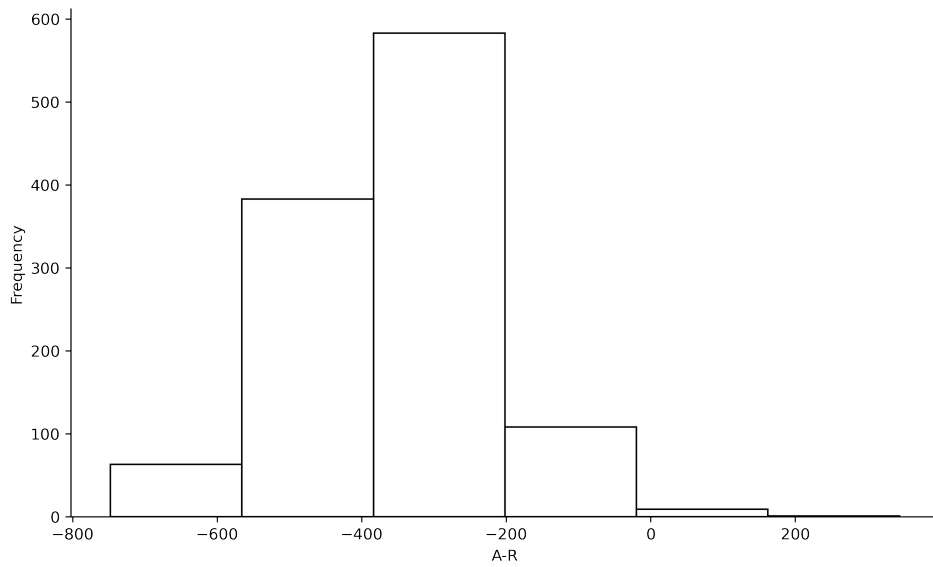
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 1-2. Box and whisker plot of A/R for ALFALFA - HAY fields in the Coalition.



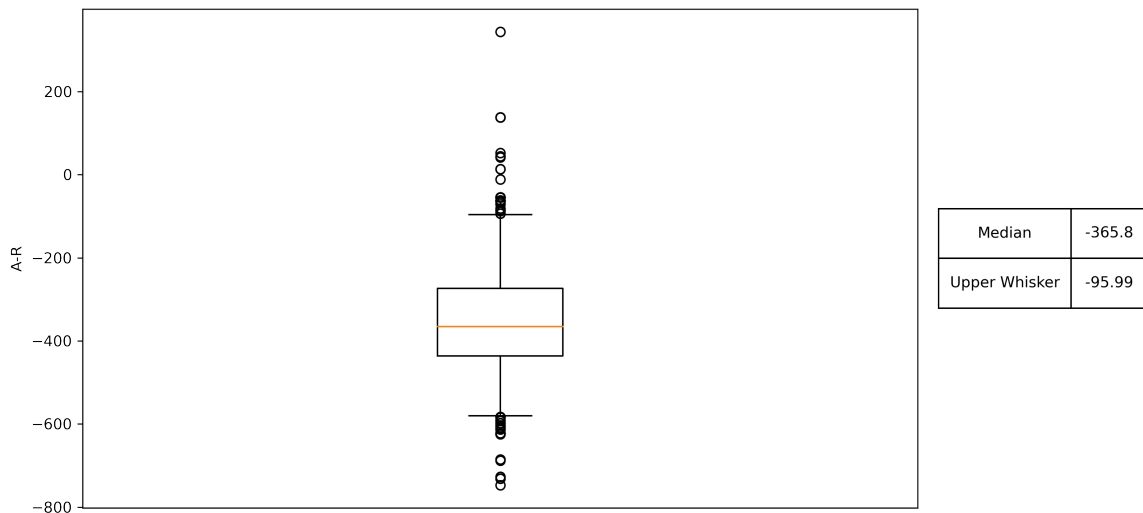
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 1-3. Histogram of A-R for ALFALFA - HAY fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 1-4. Box and whisker plot of A-R for ALFALFA - HAY fields in the Coalition.



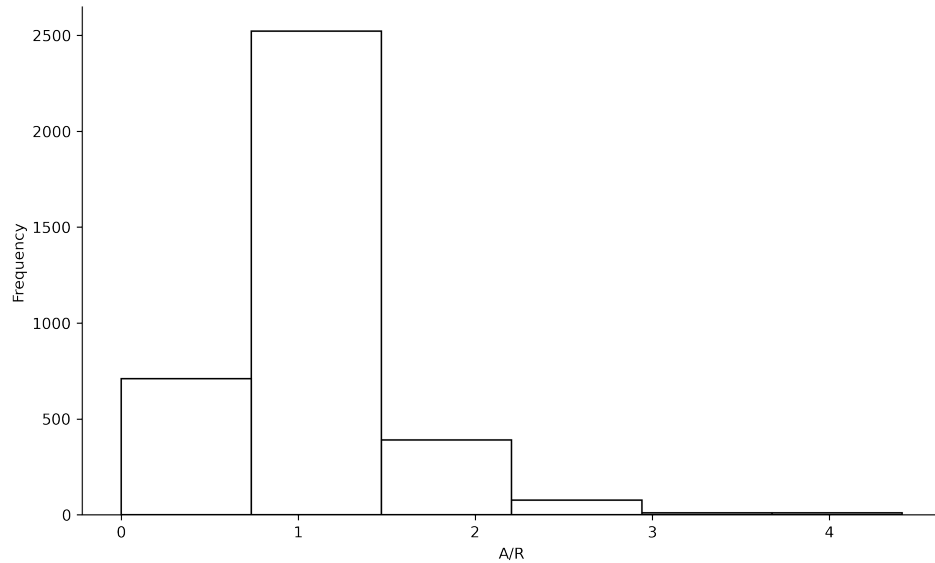
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

2. ALMOND

Table 2-1. Summary statistics for ALMOND fields in Coalition.

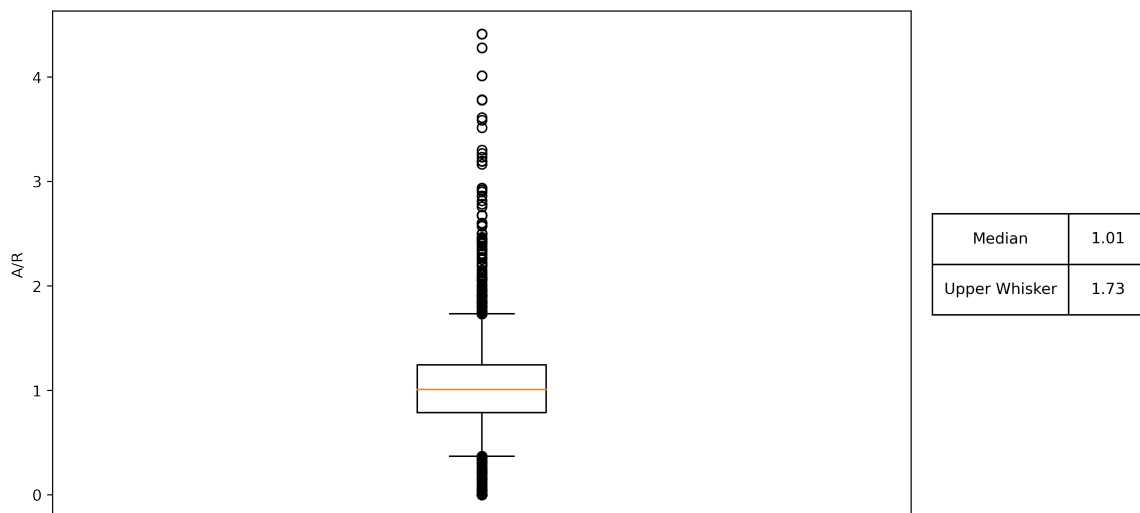
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	3747	184209.36	1.1	0.83	0.0	23.62	1.73	280
A-R	3747	184209.36	1.65	68.05	-506.3	383.07	98.75	185

Figure 2-1. Histogram of A/R for ALMOND fields in the Coalition.



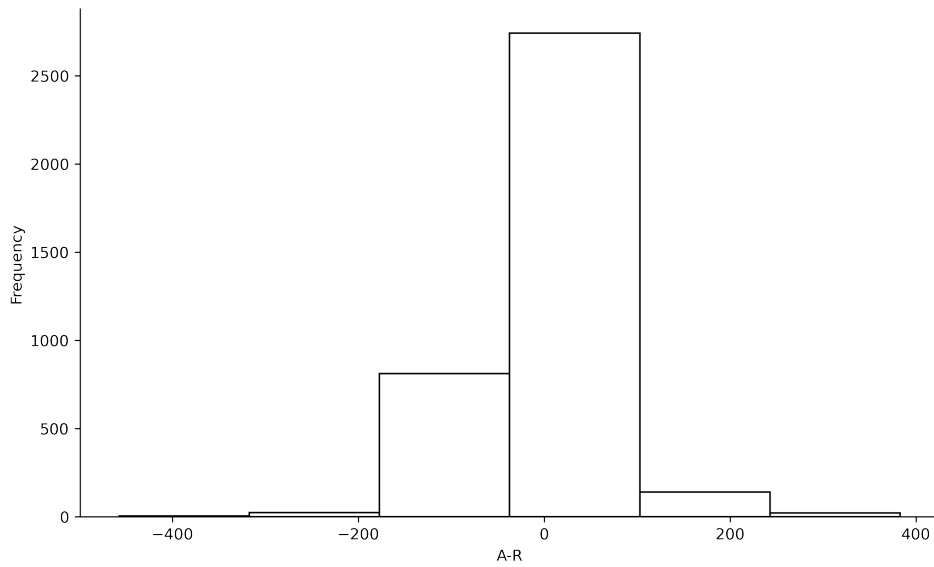
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 2-2. Box and whisker plot of A/R for ALMOND fields in the Coalition.



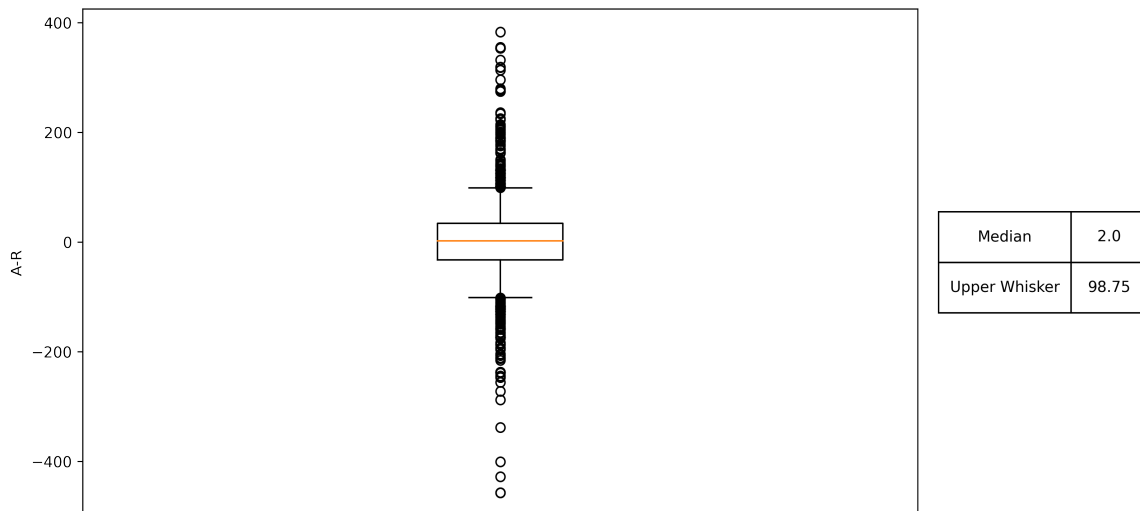
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 2-3. Histogram of A-R for ALMOND fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 2-4. Box and whisker plot of A-R for ALMOND fields in the Coalition.



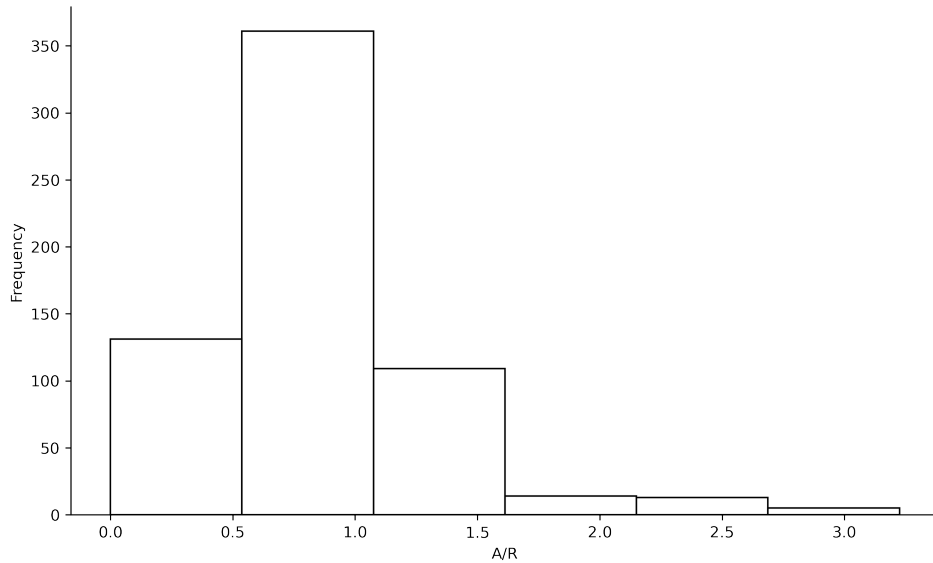
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

3. ALMOND-YOUNG

Table 3-1. Summary statistics for ALMOND-YOUNG fields in Coalition.

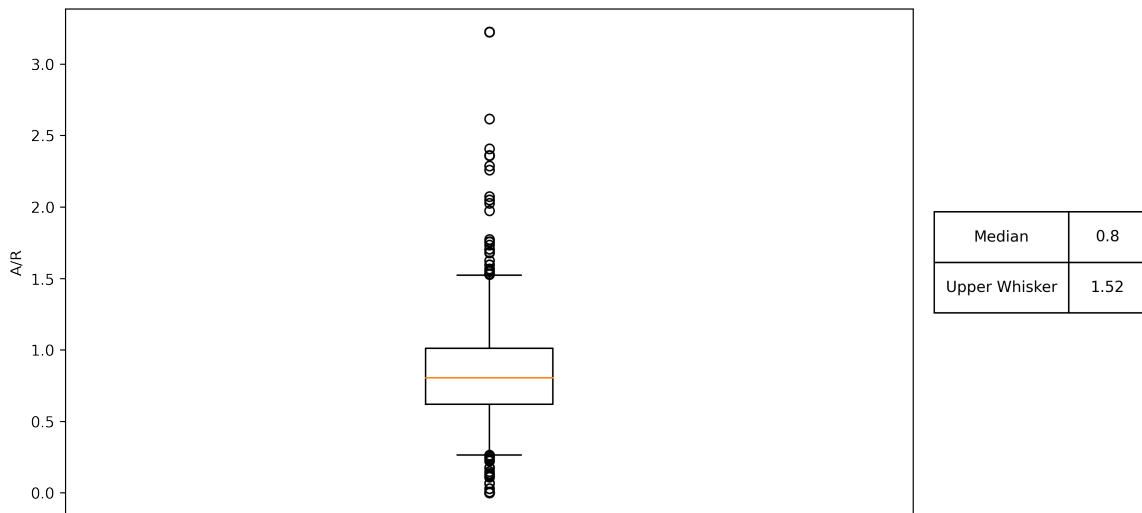
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	644	36503.37	0.91	0.66	0.0	4.31	1.52	--
A-R	644	36503.37	-22.68	80.6	-330.44	324.89	71.3	--

Figure 3-1. Histogram of A/R for ALMOND-YOUNG fields in the Coalition.



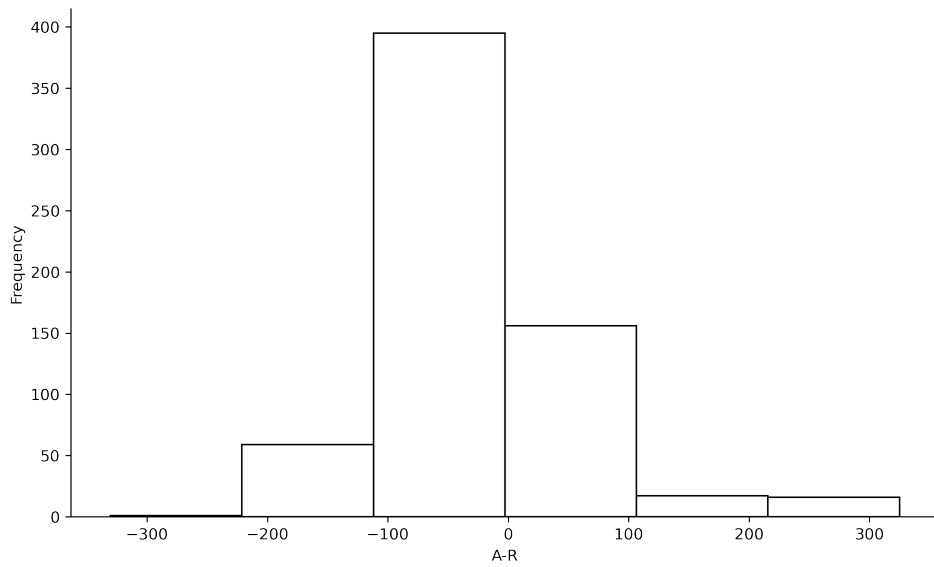
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 3-2. Box and whisker plot of A/R for ALMOND-YOUNG fields in the Coalition.



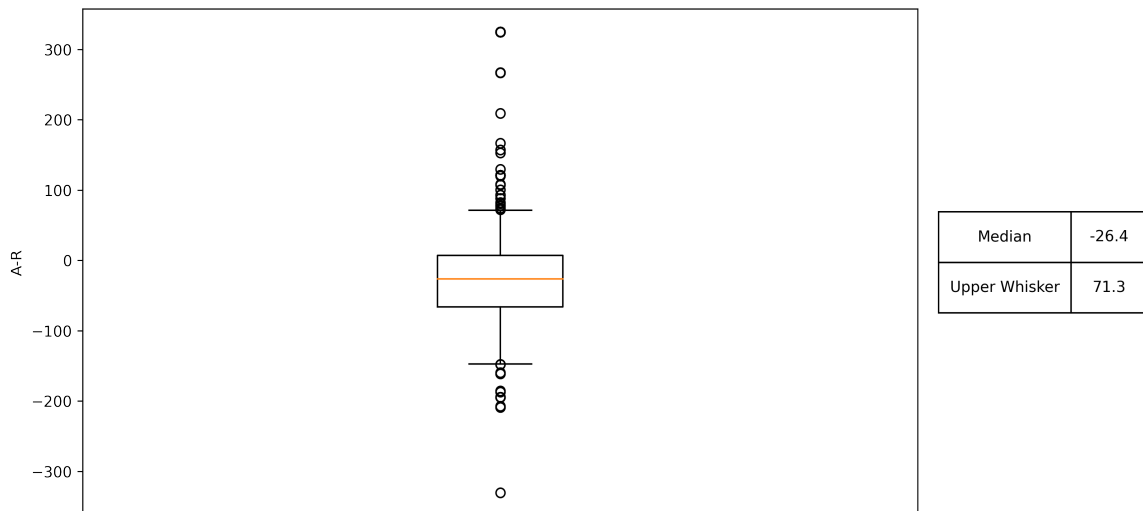
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 3-3. Histogram of A-R for ALMOND-YOUNG fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 3-4. Box and whisker plot of A-R for ALMOND-YOUNG fields in the Coalition.



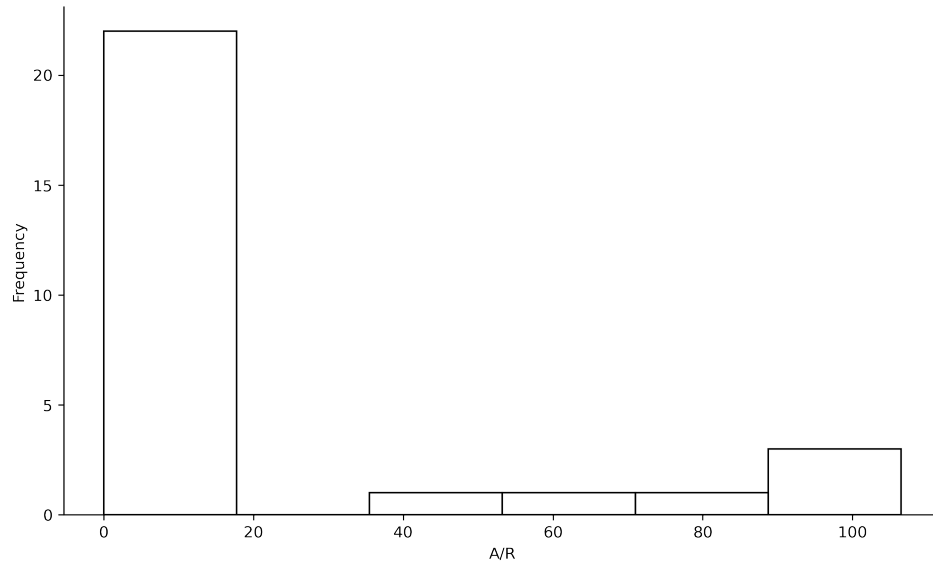
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

4. APPLE

Table 4-1. Summary statistics for APPLE fields in Coalition.

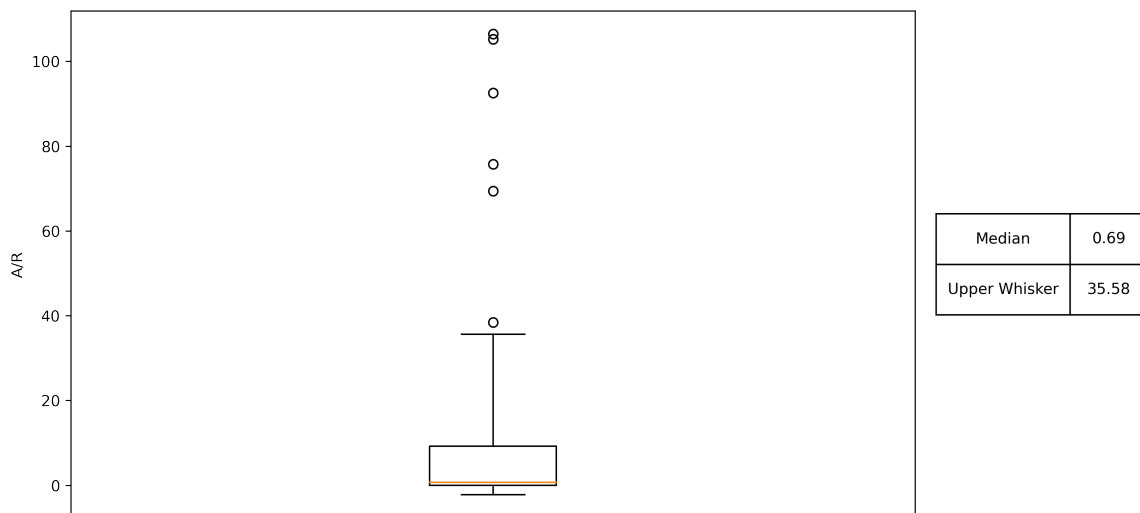
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	28	406.9	19.32	34.94	0.0	106.48	35.58	6
A-R	28	406.9	29.06	50.18	-26.24	162.62	253.72	0

Figure 4-1. Histogram of A/R for APPLE fields in the Coalition.



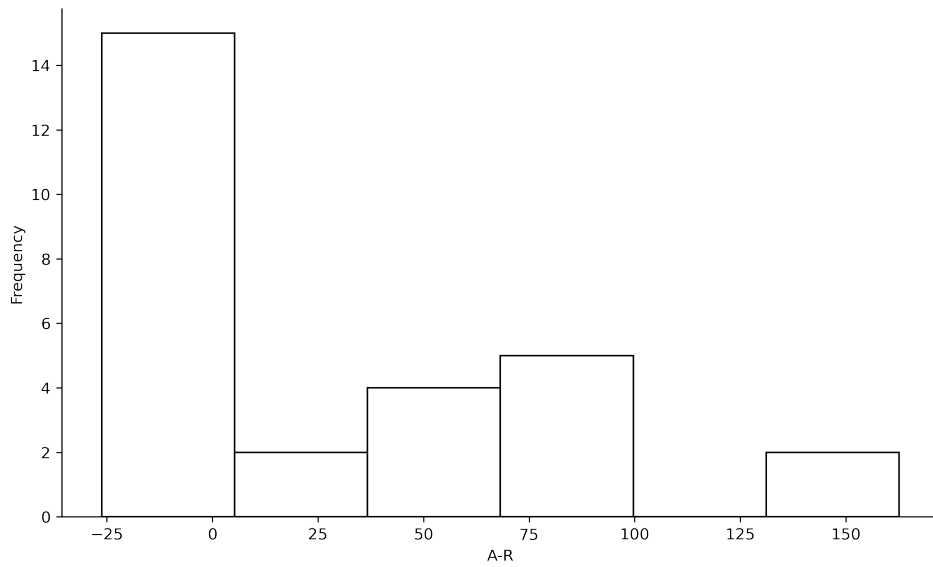
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 4-2. Box and whisker plot of A/R for APPLE fields in the Coalition.



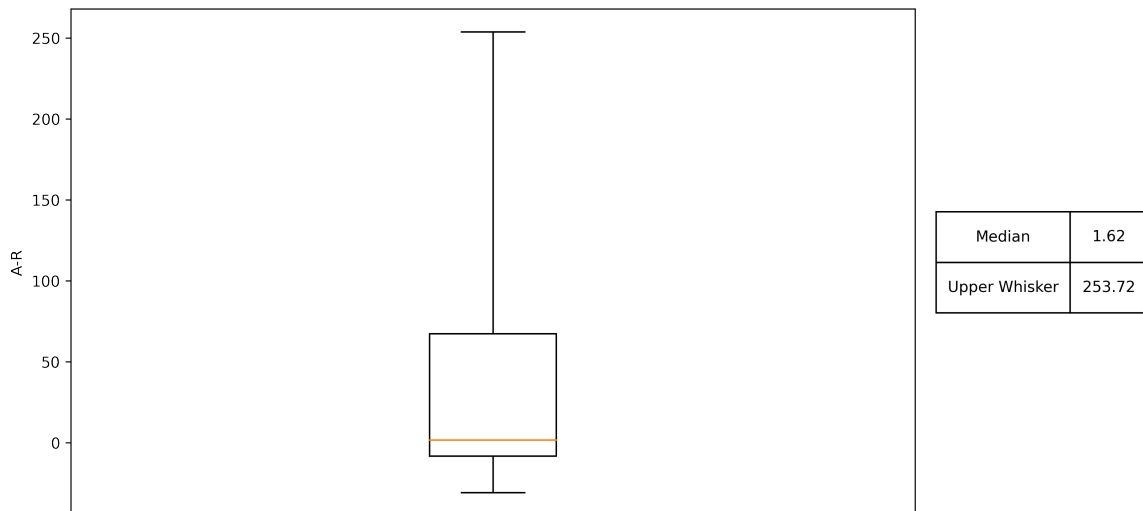
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 4-3. Histogram of A-R for APPLE fields in the Coalition.



Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 4-4. Box and whisker plot of A-R for APPLE fields in the Coalition.



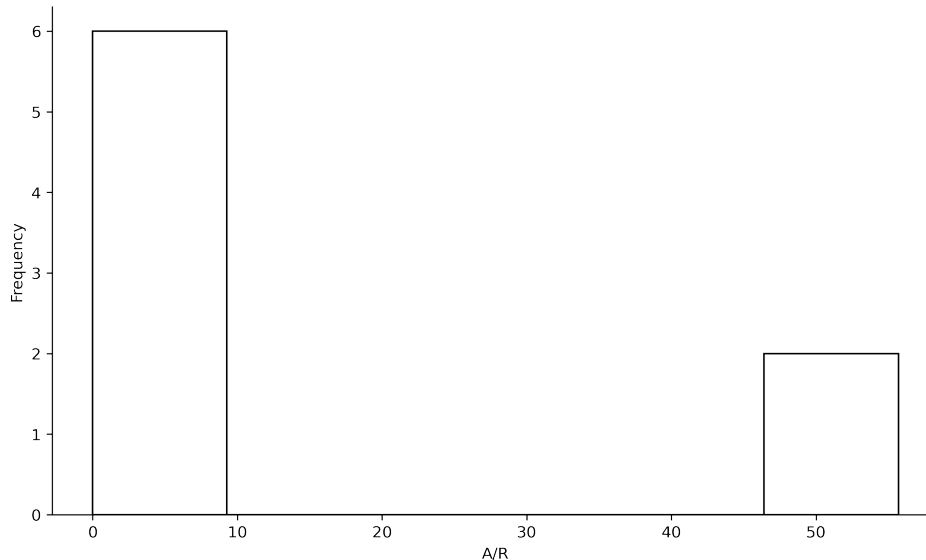
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

5. APRICOT/APRIUM

Table 5-1. Summary statistics for APRICOT/APRIUM fields in Coalition.

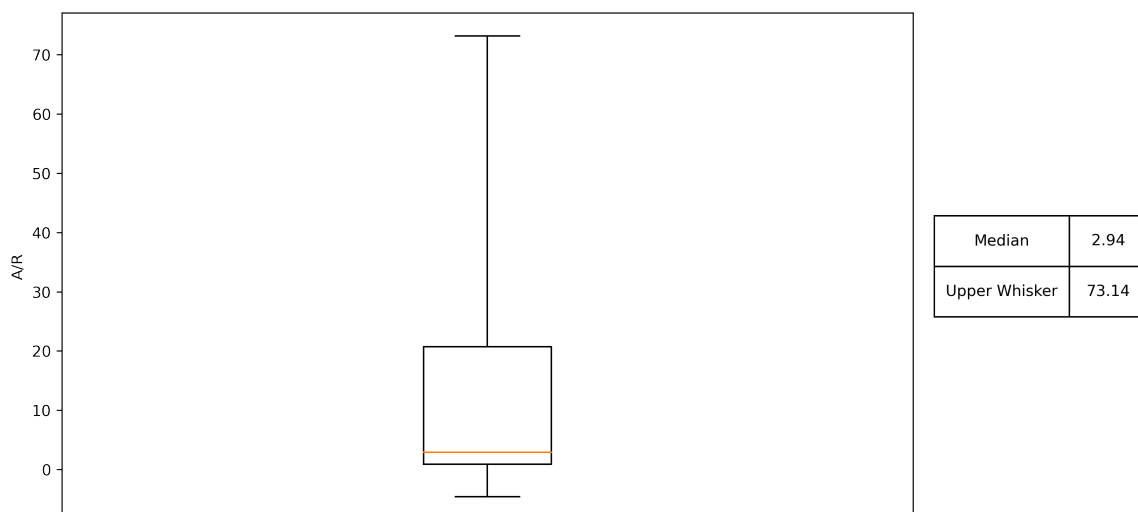
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	8	14.44	15.94	24.71	0.0	55.7	73.14	0
A-R	8	14.44	49.87	75.32	-11.26	164.22	339.78	0

Figure 5-1. Histogram of A/R for APRICOT/APRIUM fields in the Coalition.



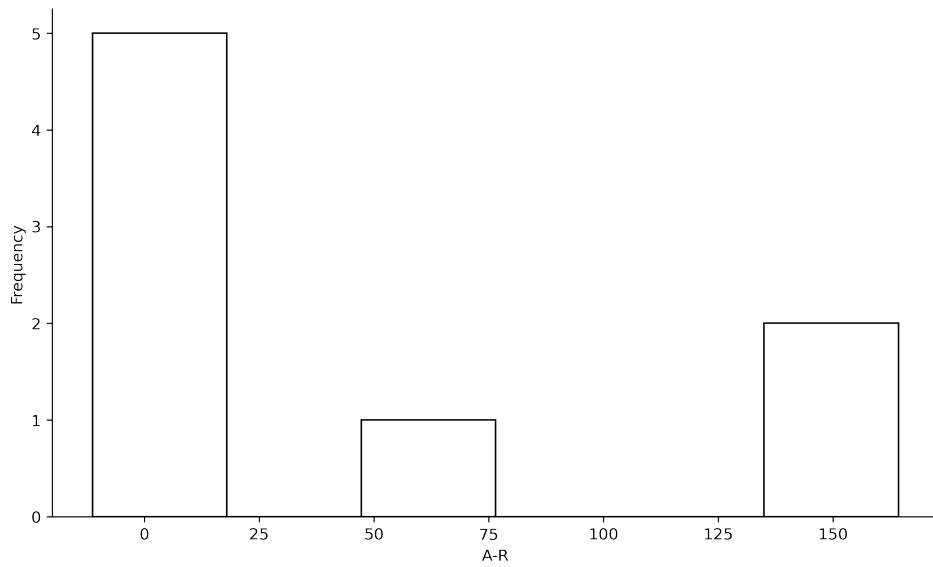
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 5-2. Box and whisker plot of A/R for APRICOT/APRIUM fields in the Coalition.



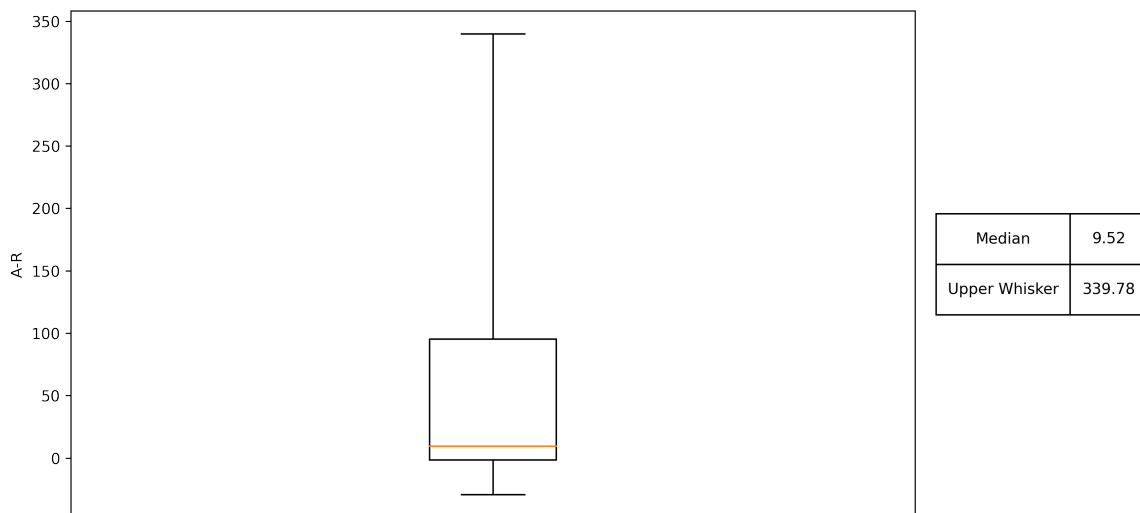
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 5-3. Histogram of A-R for APRICOT/APRIUM fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 5-4. Box and whisker plot of A-R for APRICOT/APRIUM fields in the Coalition.



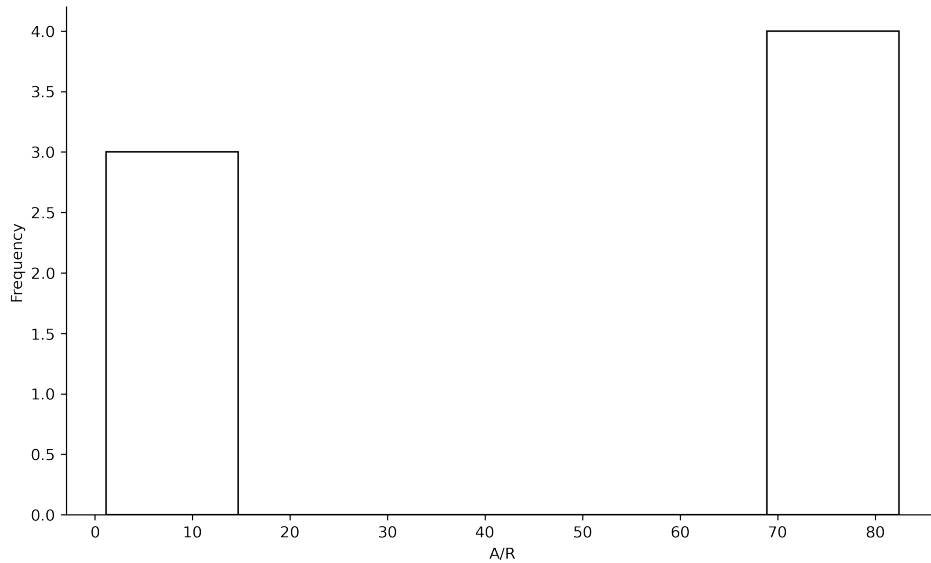
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

6. ASPARAGUS

Table 6-1. Summary statistics for ASPARAGUS fields in Coalition.

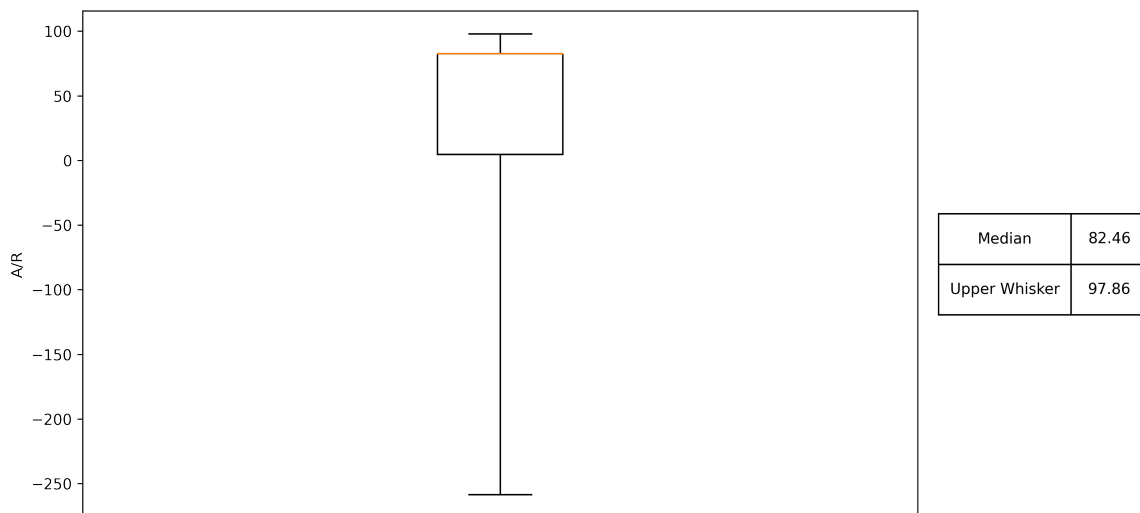
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	7	226.25	48.56	42.31	1.14	82.46	97.86	0
A-R	7	226.25	87.28	54.86	1.23	128.42	144.3	0

Figure 6-1. Histogram of A/R for ASPARAGUS fields in the Coalition.



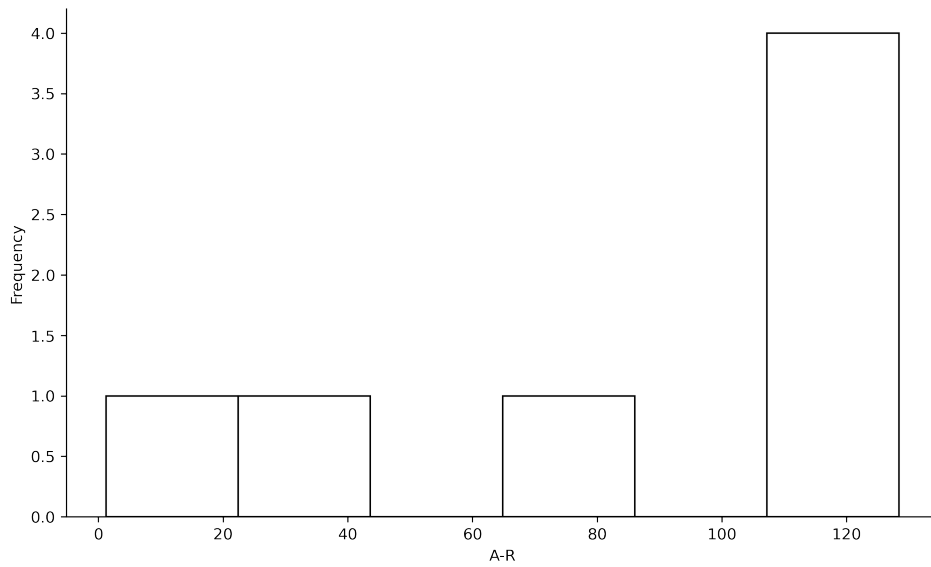
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 6-2. Box and whisker plot of A/R for ASPARAGUS fields in the Coalition.



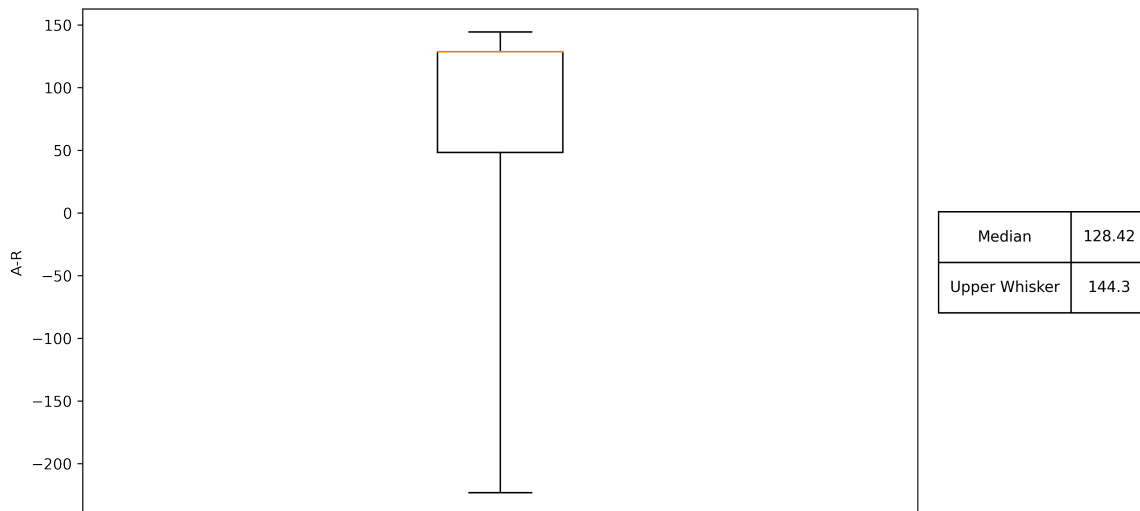
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 6-3. Histogram of A-R for ASPARAGUS fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 6-4. Box and whisker plot of A-R for ASPARAGUS fields in the Coalition.



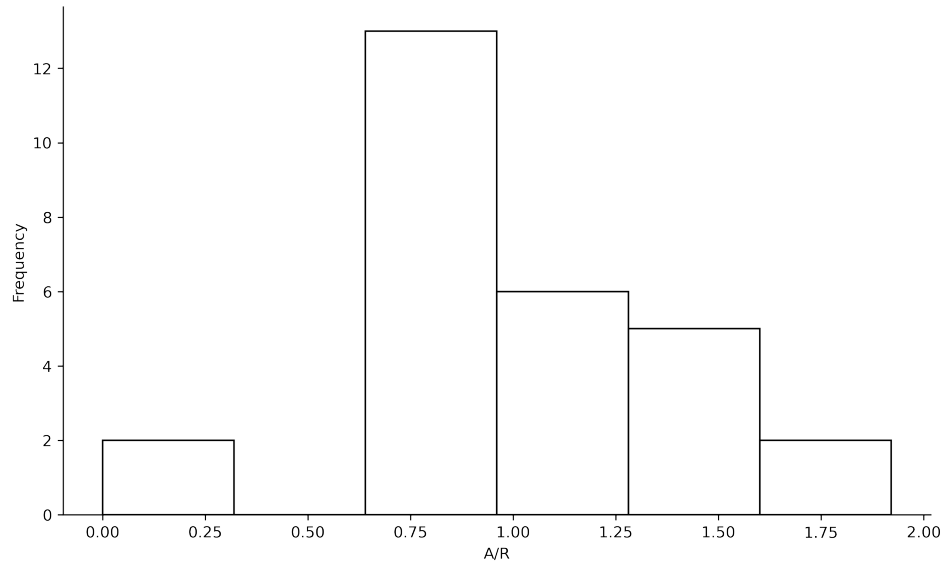
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

7. BARLEY - GRAIN

Table 7-1. Summary statistics for BARLEY - GRAIN fields in Coalition.

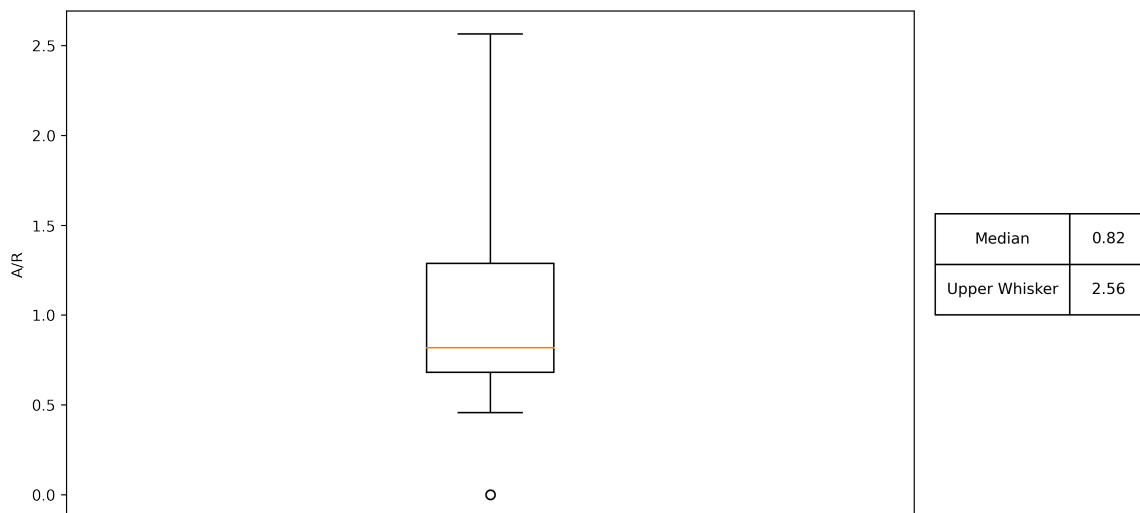
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	28	1097.2	0.99	0.46	0.0	1.92	2.56	0
A-R	28	1097.2	-4.21	28.58	-44.5	39.52	104.87	0

Figure 7-1. Histogram of A/R for BARLEY - GRAIN fields in the Coalition.



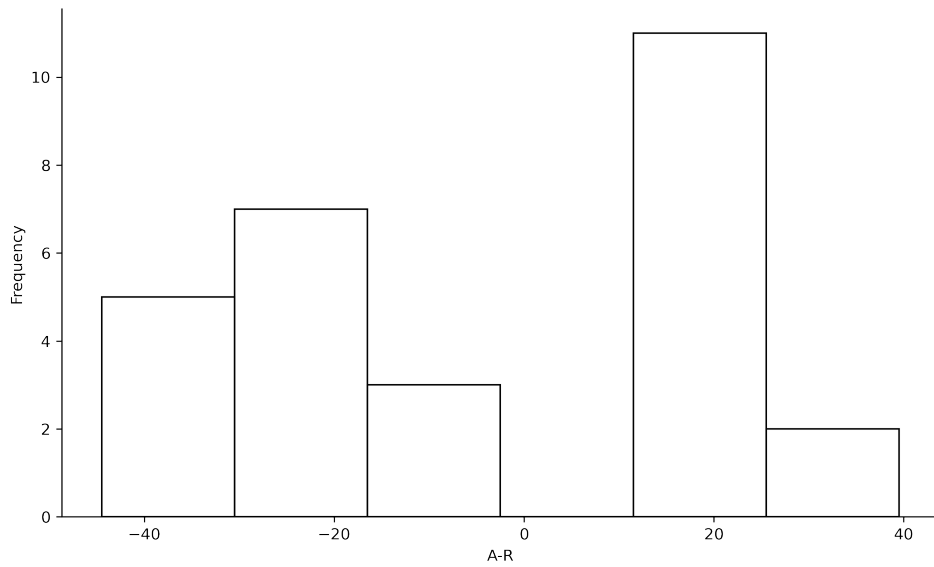
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 7-2. Box and whisker plot of A/R for BARLEY - GRAIN fields in the Coalition.



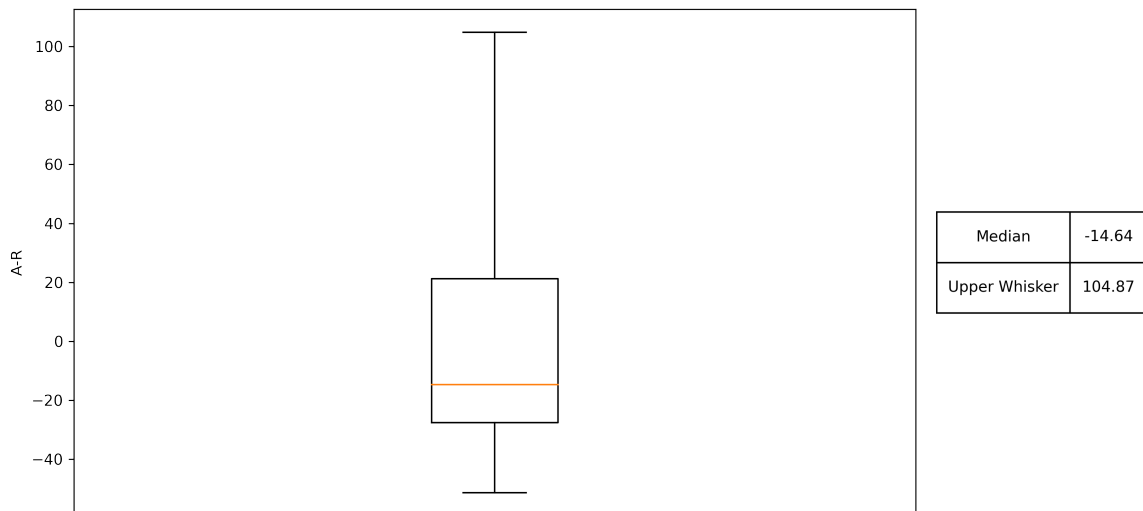
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 7-3. Histogram of A-R for BARLEY - GRAIN fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 7-4. Box and whisker plot of A-R for BARLEY - GRAIN fields in the Coalition.



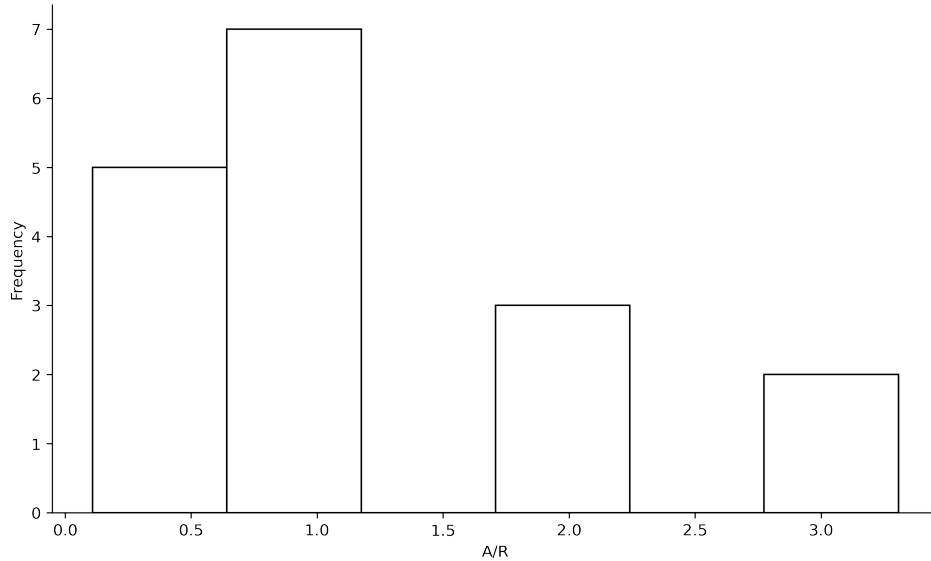
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

8. BARLEY - NR

Table 8-1. Summary statistics for BARLEY - NR fields in Coalition.

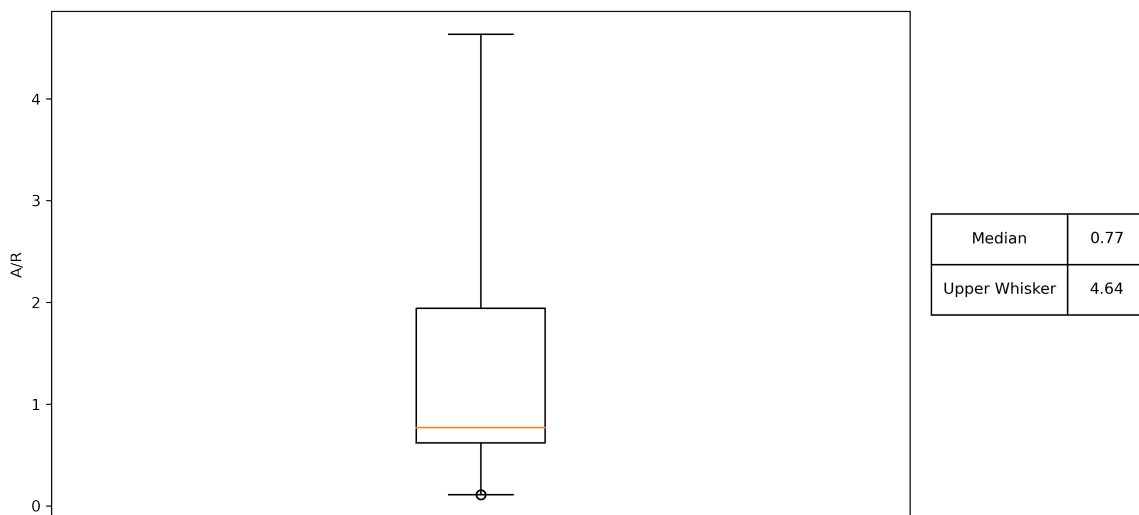
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	17	913.0	1.15	1.0	0.11	3.31	4.64	0
A-R	17	913.0	-5.57	56.88	-81.71	79.0	200.37	0

Figure 8-1. Histogram of A/R for BARLEY - NR fields in the Coalition.



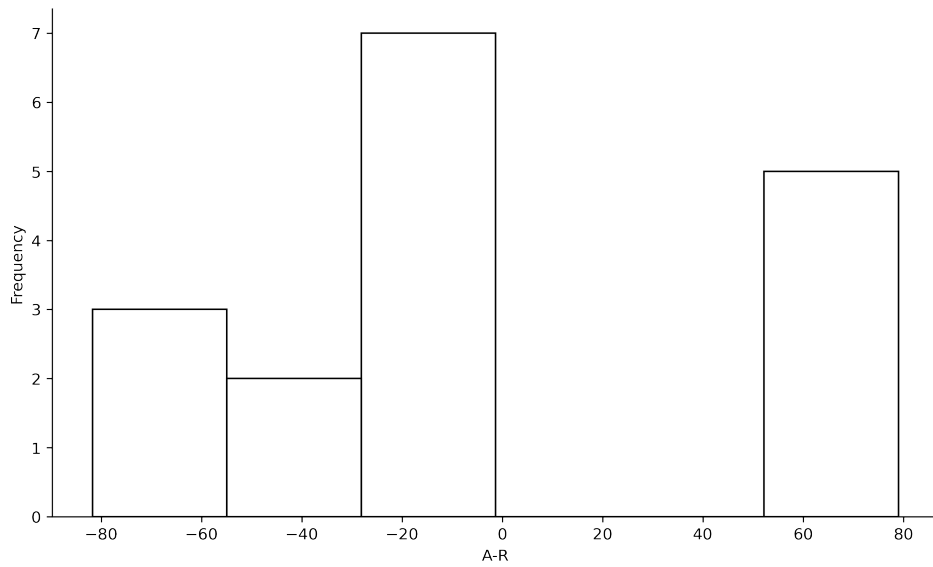
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 8-2. Box and whisker plot of A/R for BARLEY - NR fields in the Coalition.



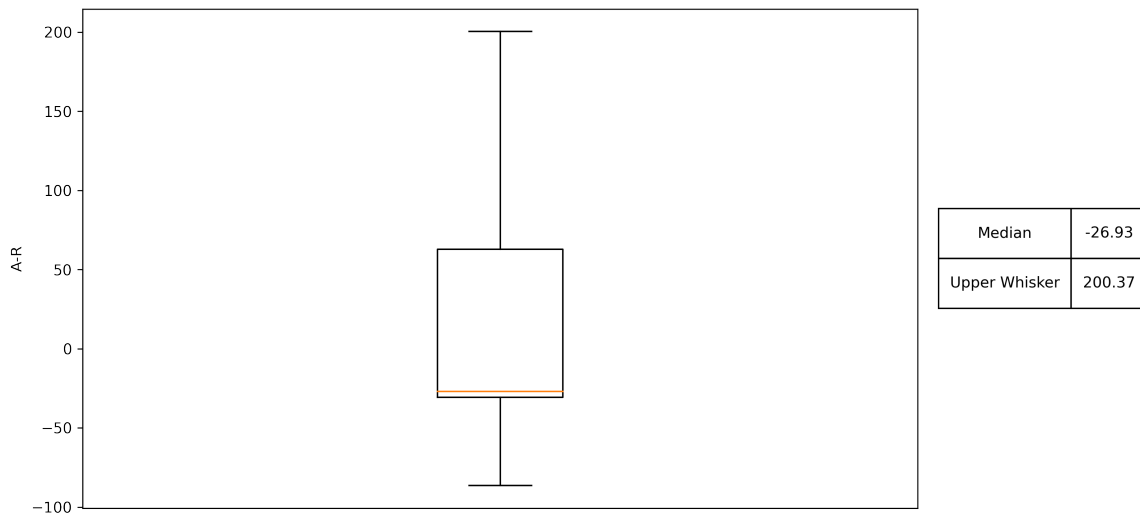
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 8-3. Histogram of A-R for BARLEY - NR fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 8-4. Box and whisker plot of A-R for BARLEY - NR fields in the Coalition.



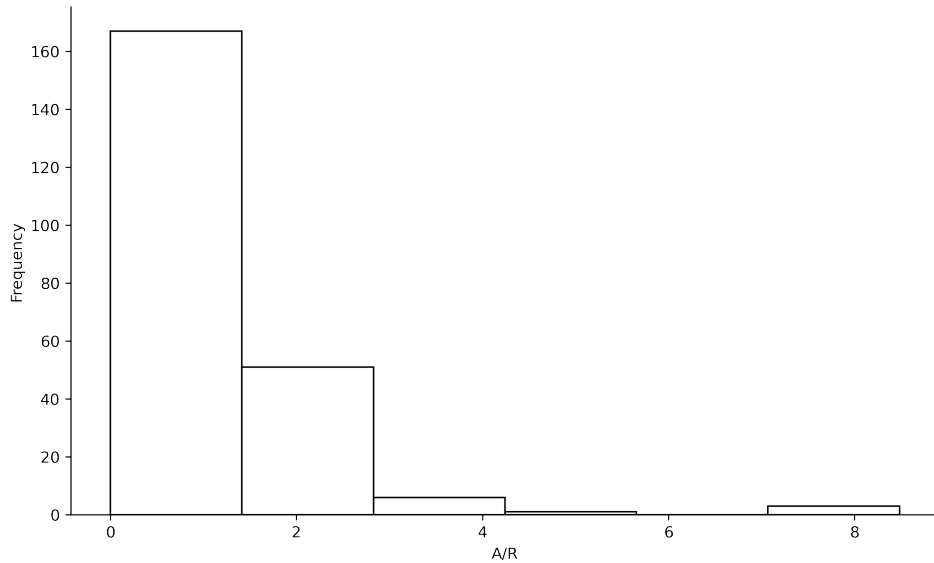
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

9. BEAN DRY

Table 9-1. Summary statistics for BEAN DRY fields in Coalition.

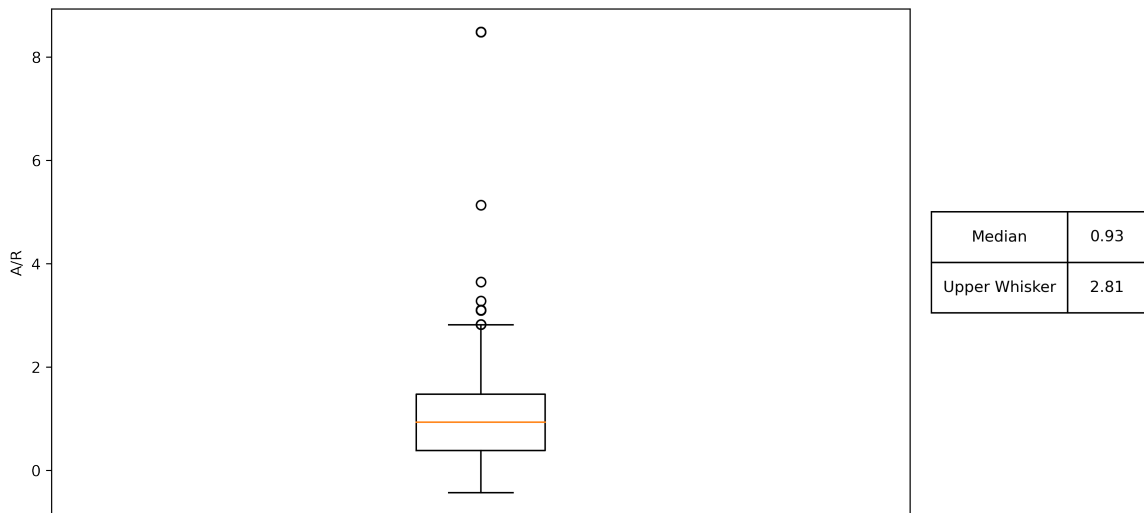
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	228	10192.39	1.15	1.22	0.0	8.48	2.81	12
A-R	228	10192.39	-2.97	52.24	-122.12	161.04	97.88	11

Figure 9-1. Histogram of A/R for BEAN DRY fields in the Coalition.



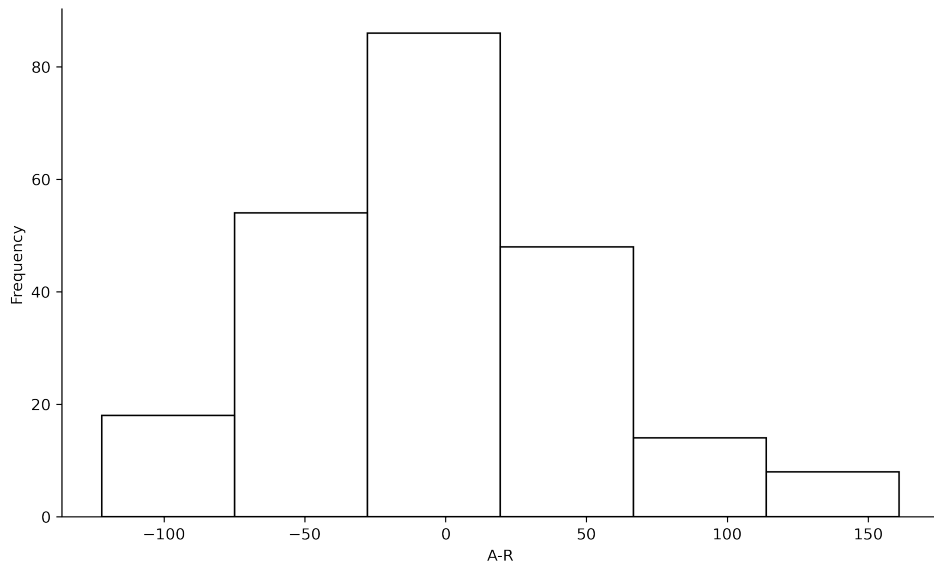
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 9-2. Box and whisker plot of A/R for BEAN DRY fields in the Coalition.



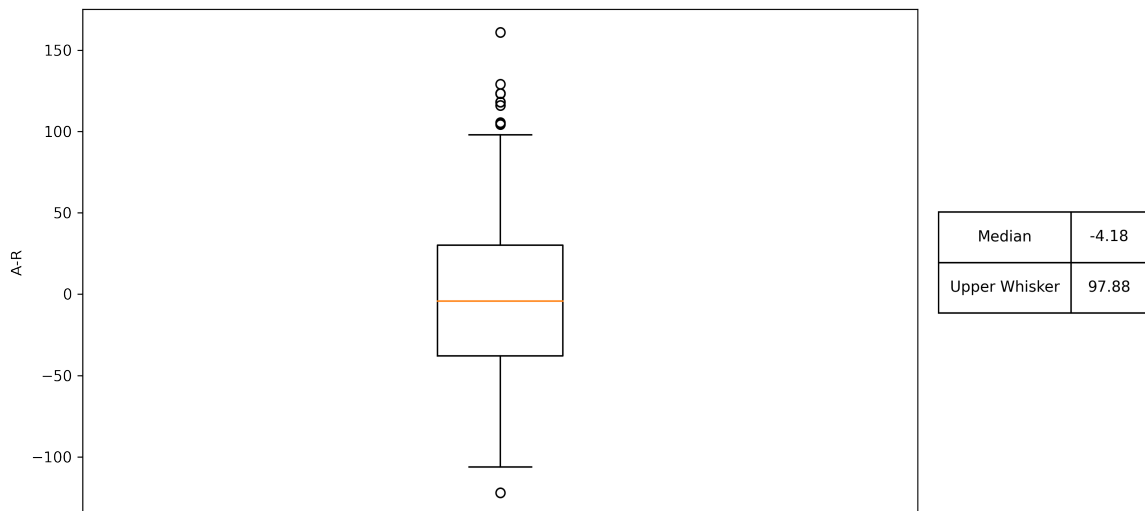
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 9-3. Histogram of A-R for BEAN DRY fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 9-4. Box and whisker plot of A-R for BEAN DRY fields in the Coalition.



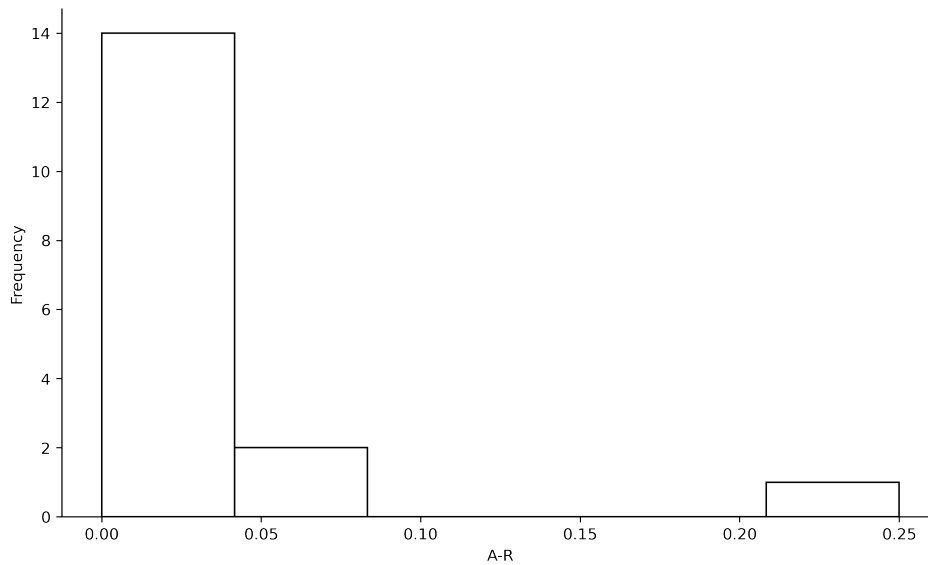
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

10. BERRY

Table 10-1. Summary statistics for BERRY fields in Coalition.

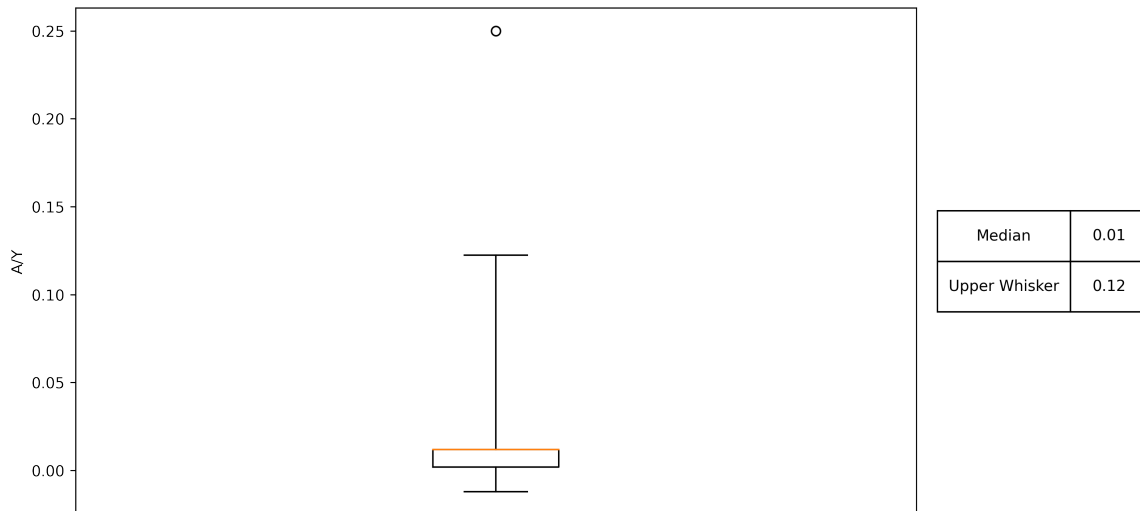
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/Y	19	84.64	2.6	10.81	0.0	47.22	0.12	3

Figure 10-1. Histogram of A/Y for BERRY fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot

Figure 10-2. Box and whisker plot of A/Y for BERRY fields in the Coalition.



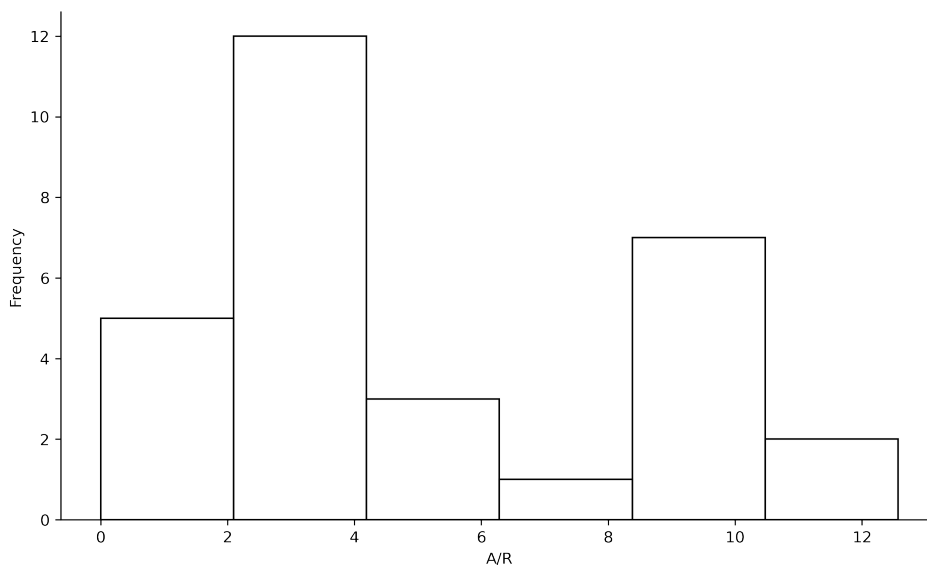
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot
The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

11. CHERRY

Table 11-1. Summary statistics for CHERRY fields in Coalition.

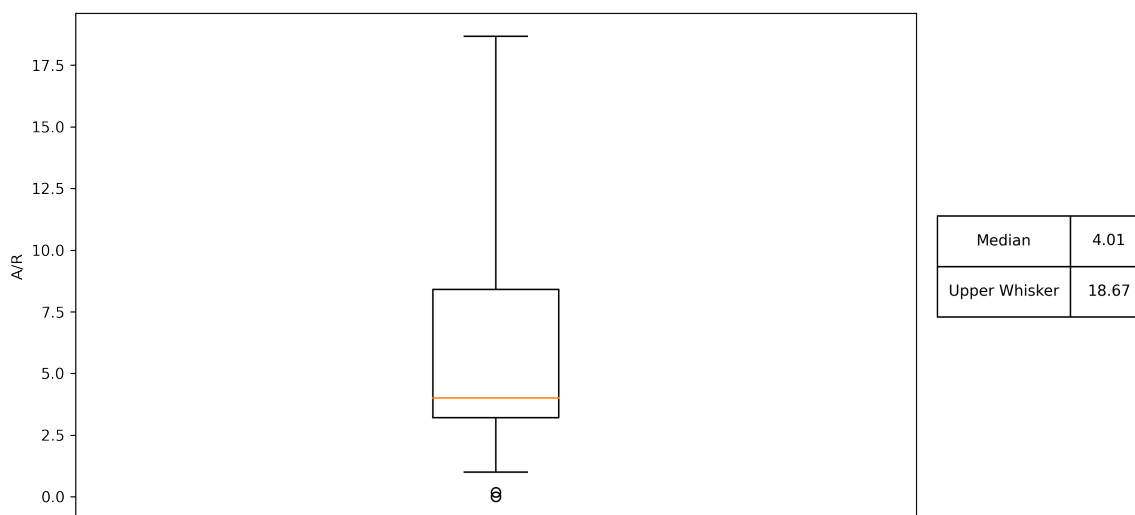
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	31	1271.4	7.3	10.99	0.0	63.63	18.67	1
A-R	31	1271.4	38.68	28.43	-4.42	136.74	50.97	3

Figure 11-1. Histogram of A/R for CHERRY fields in the Coalition.



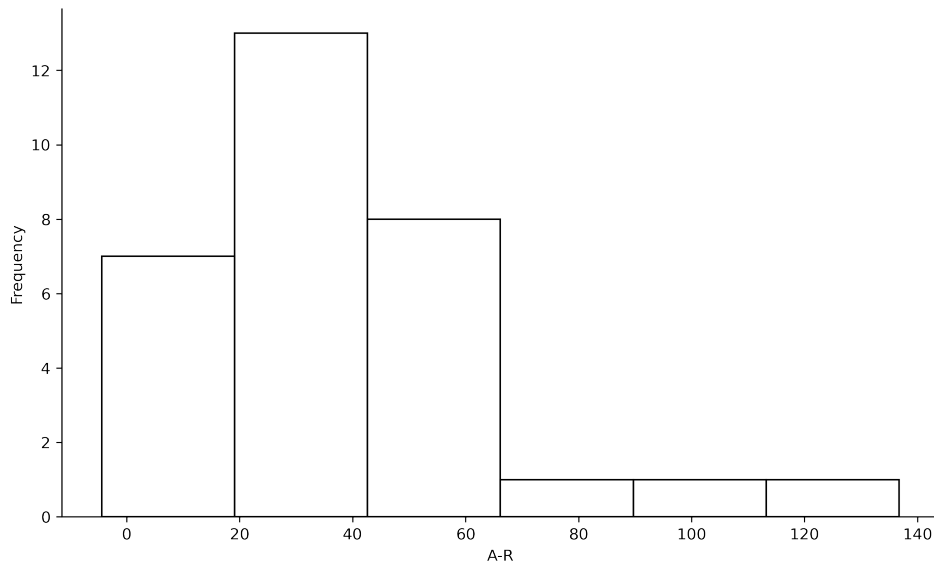
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 11-2. Box and whisker plot of A/R for CHERRY fields in the Coalition.



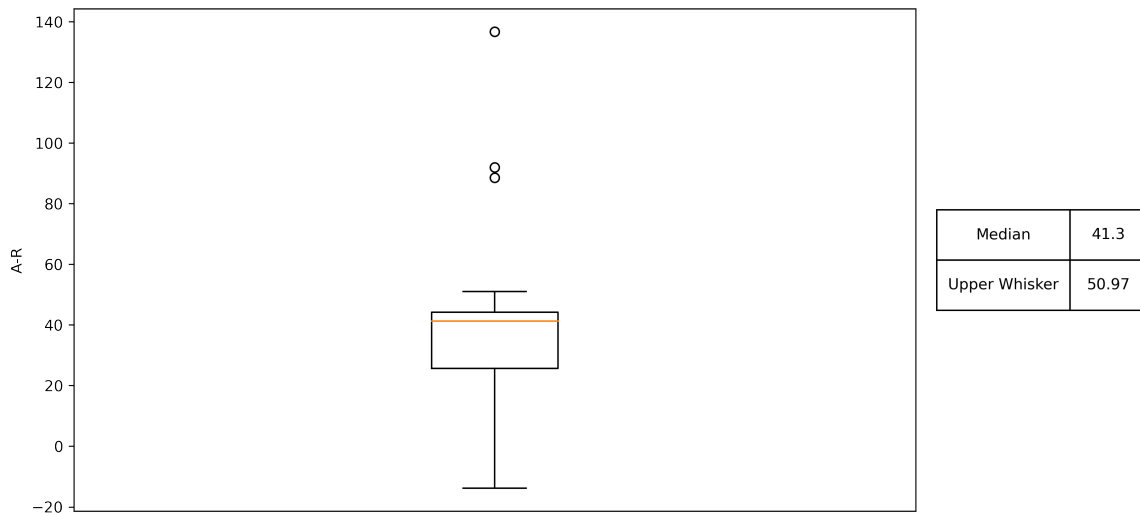
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 11-3. Histogram of A-R for CHERRY fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 11-4. Box and whisker plot of A-R for CHERRY fields in the Coalition.



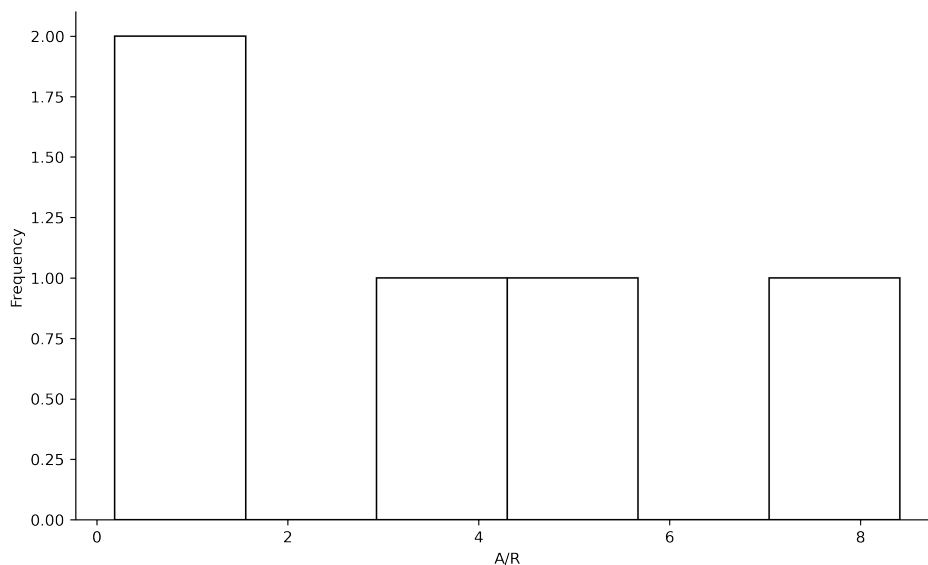
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

12. CHERRY-YOUNG

Table 12-1. Summary statistics for CHERRY-YOUNG fields in Coalition.

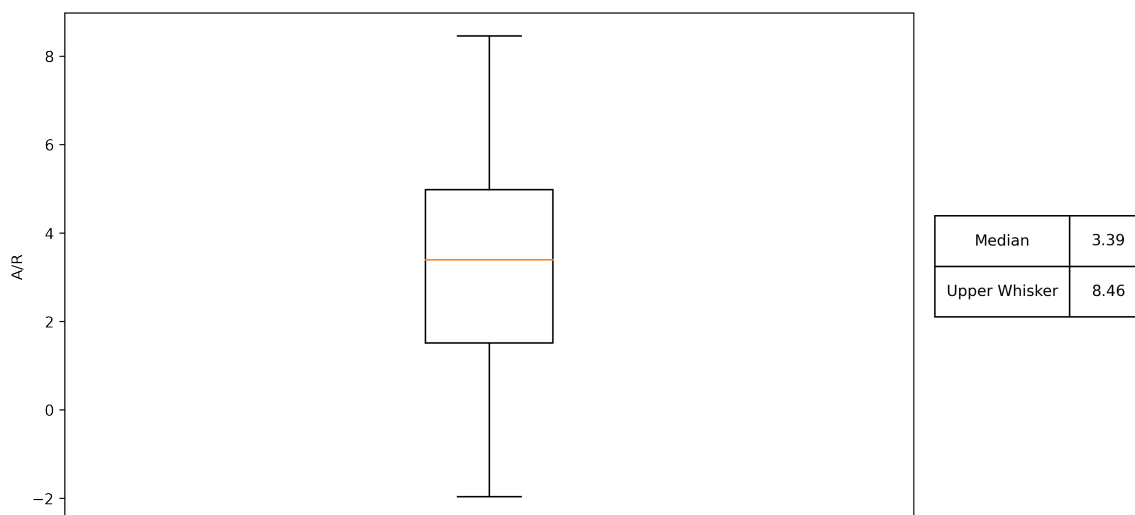
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	5	138.0	3.7	3.2	0.19	8.41	8.46	--
A-R	5	138.0	19.46	17.66	-4.3	44.23	38.42	--

Figure 12-1. Histogram of A/R for CHERRY-YOUNG fields in the Coalition.



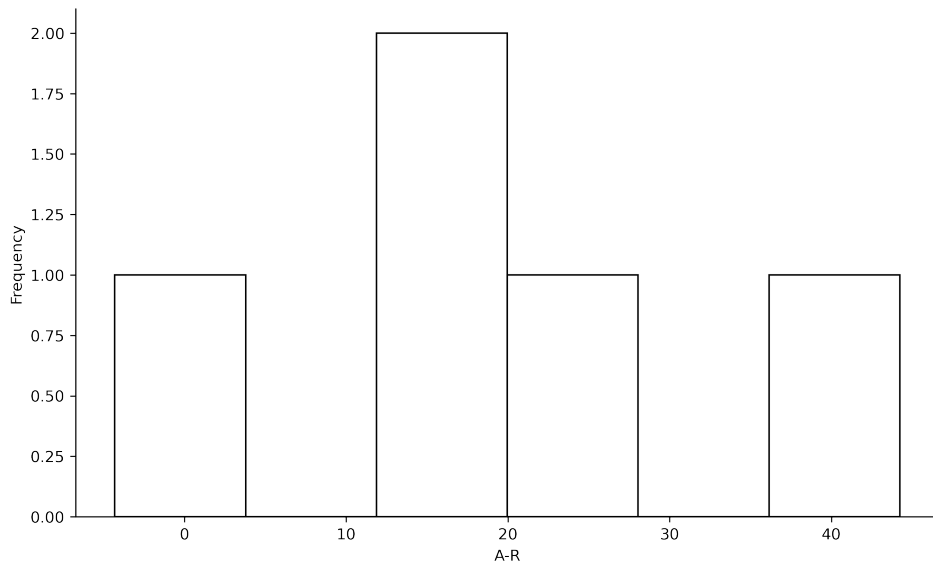
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 12-2. Box and whisker plot of A/R for CHERRY-YOUNG fields in the Coalition.



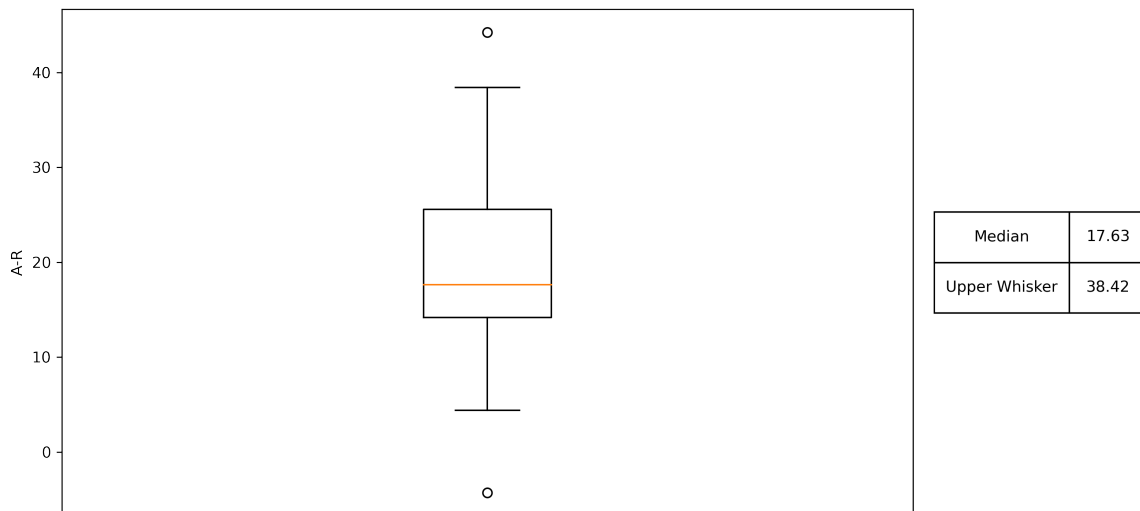
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 12-3. Histogram of A-R for CHERRY-YOUNG fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 12-4. Box and whisker plot of A-R for CHERRY-YOUNG fields in the Coalition.



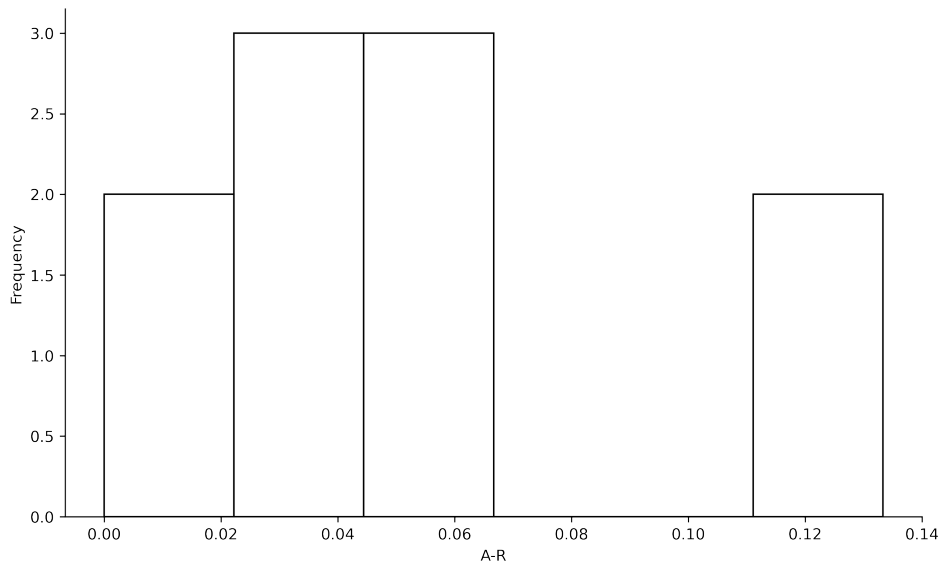
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

13. CHESTNUT

Table 13-1. Summary statistics for CHESTNUT fields in Coalition.

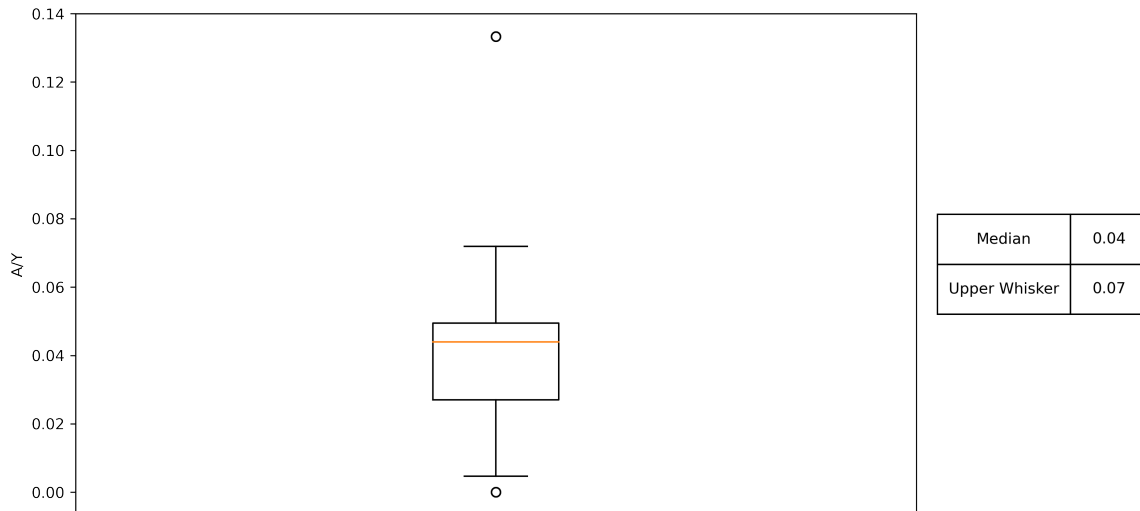
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/Y	10	78.48	0.05	0.05	0.0	0.13	0.07	2

Figure 13-1. Histogram of A/Y for CHESTNUT fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot

Figure 13-2. Box and whisker plot of A/Y for CHESTNUT fields in the Coalition.



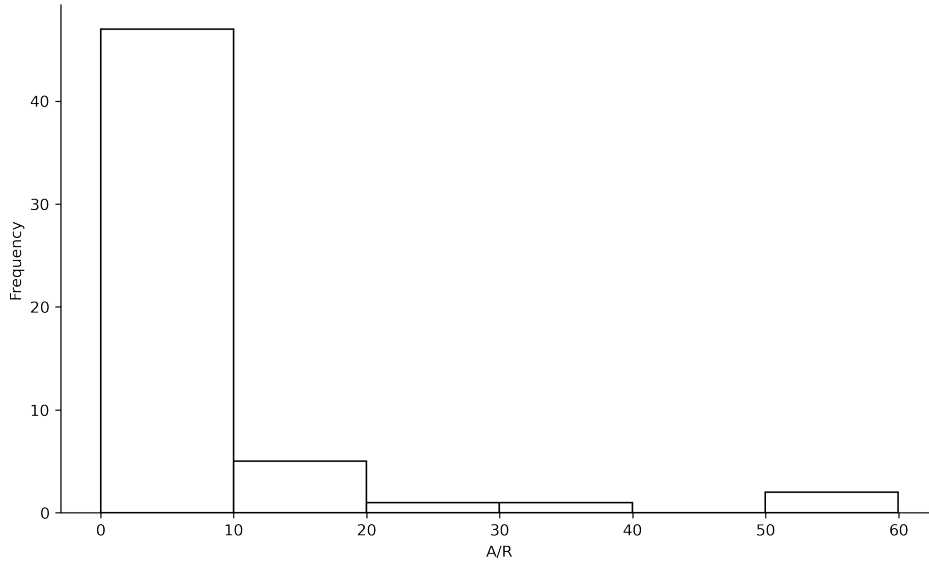
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot
The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

14. CITRUS

Table 14-1. Summary statistics for CITRUS fields in Coalition.

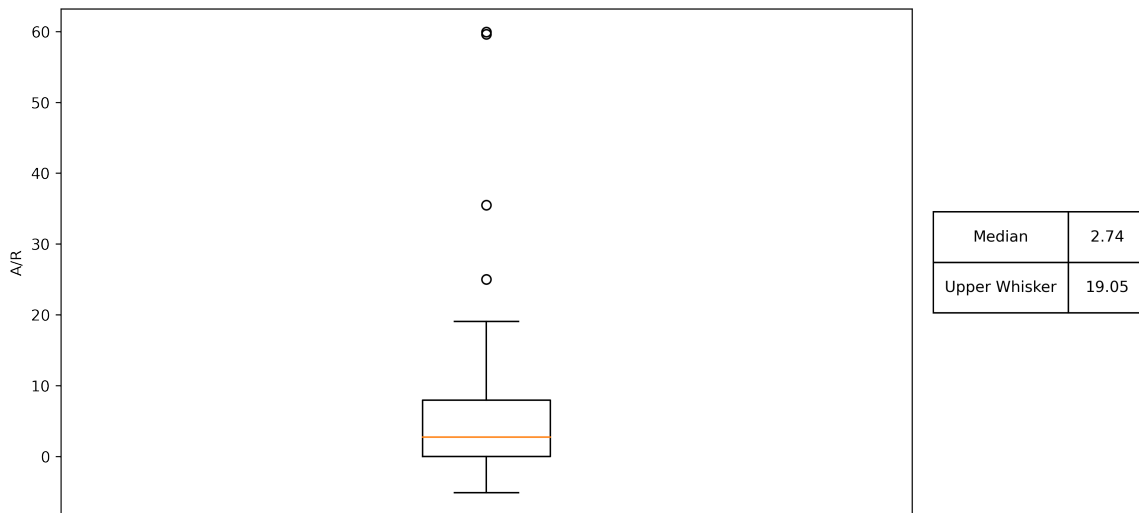
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	58	444.36	10.26	23.36	0.0	127.84	19.05	6
A-R	58	444.36	47.28	69.7	-45.29	294.97	240.01	1

Figure 14-1. Histogram of A/R for CITRUS fields in the Coalition.



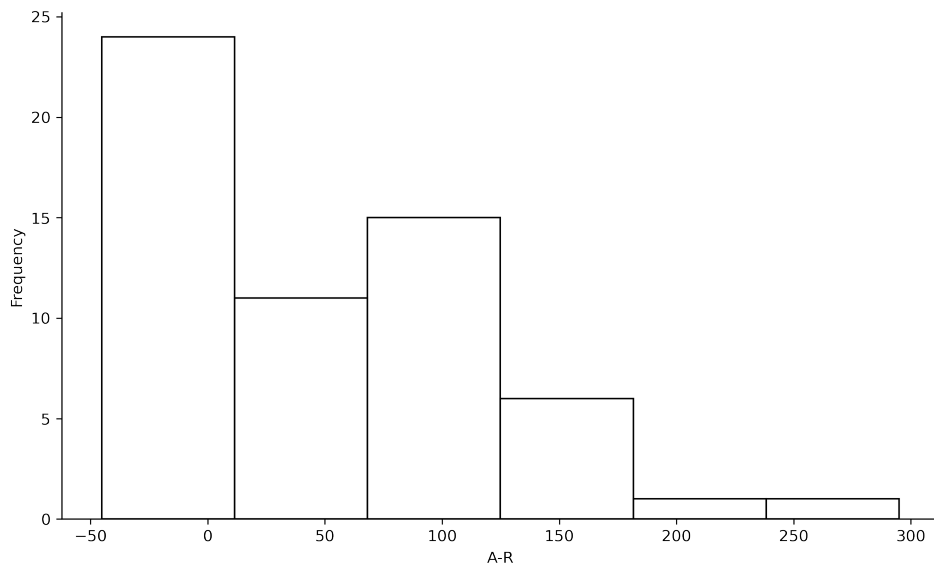
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 14-2. Box and whisker plot of A/R for CITRUS fields in the Coalition.



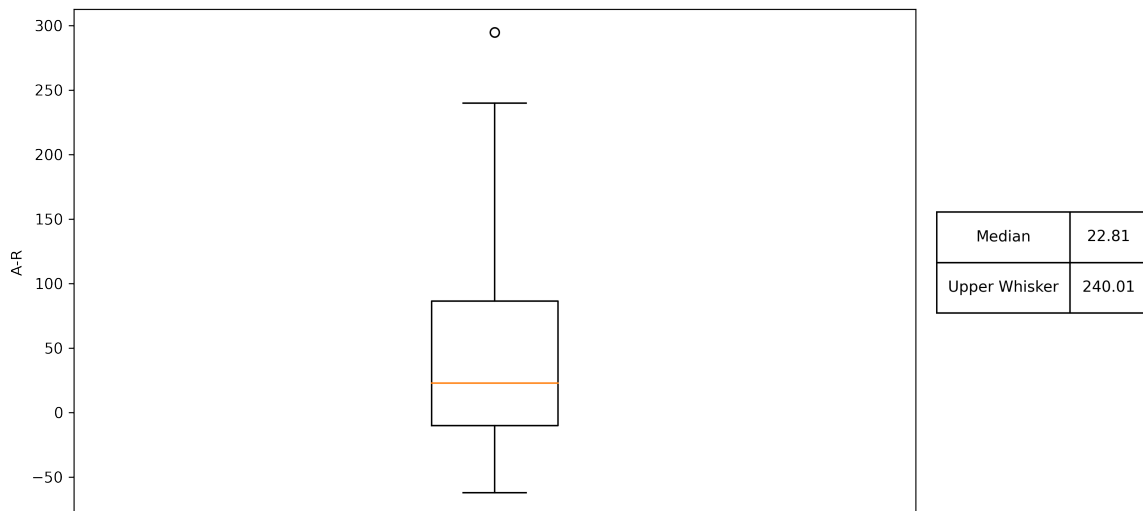
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 14-3. Histogram of A-R for CITRUS fields in the Coalition.



Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 14-4. Box and whisker plot of A-R for CITRUS fields in the Coalition.



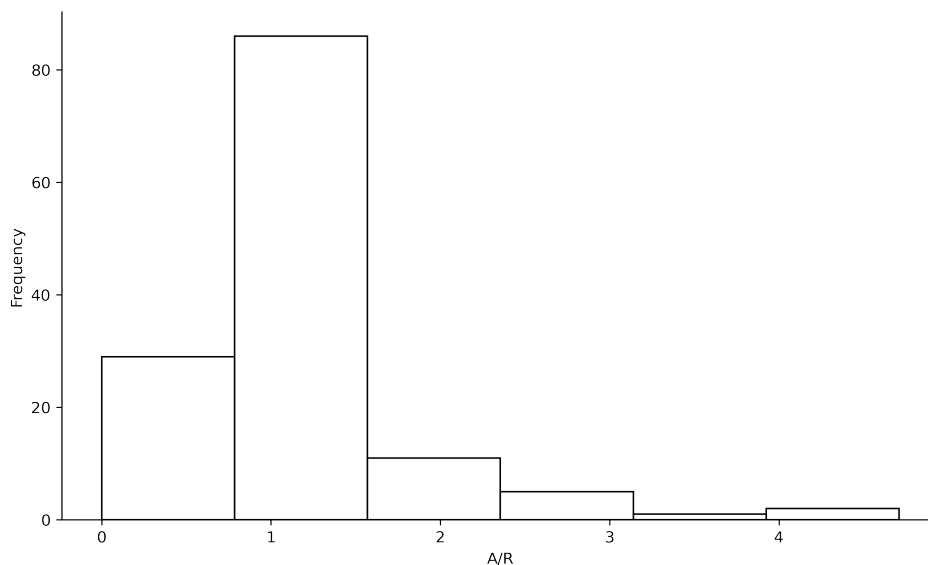
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

15. CORN - FODDER/SILAGE

Table 15-1. Summary statistics for CORN - FODDER/SILAGE fields in Coalition.

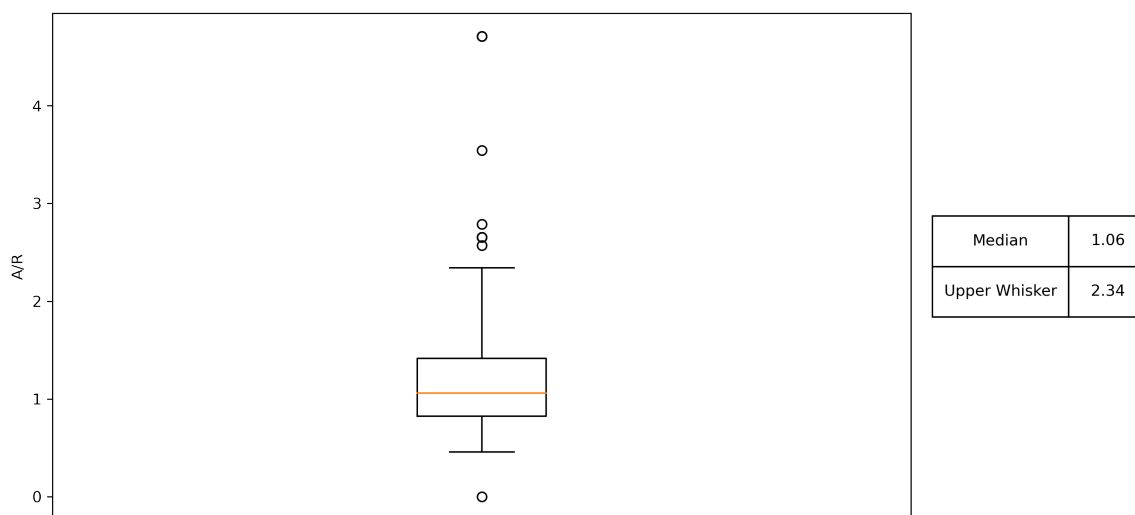
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	140	7401.74	1.44	1.29	0.0	6.64	2.34	14
A-R	140	7401.74	29.48	95.05	-154.36	287.05	219.18	6

Figure 15-1. Histogram of A/R for CORN - FODDER/SILAGE fields in the Coalition.



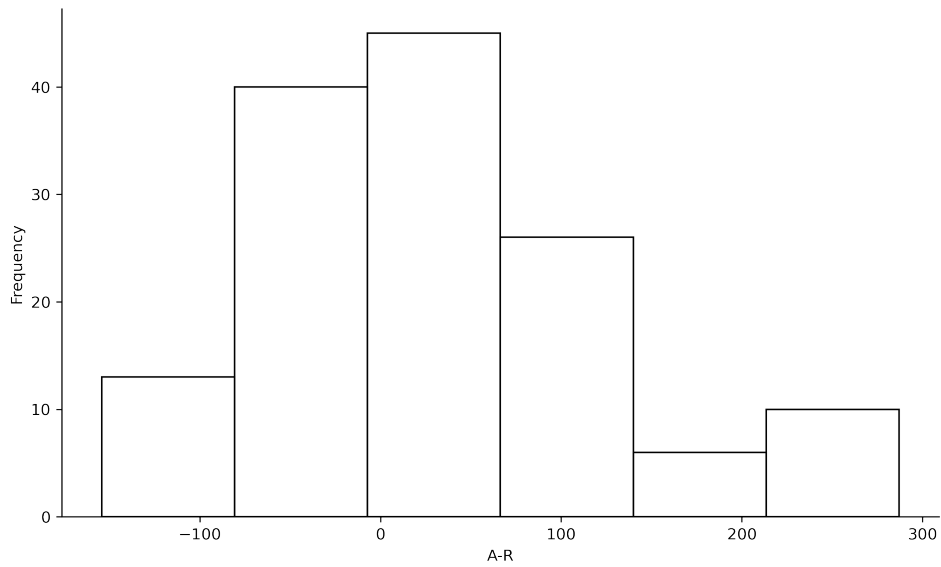
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 15-2. Box and whisker plot of A/R for CORN - FODDER/SILAGE fields in the Coalition.



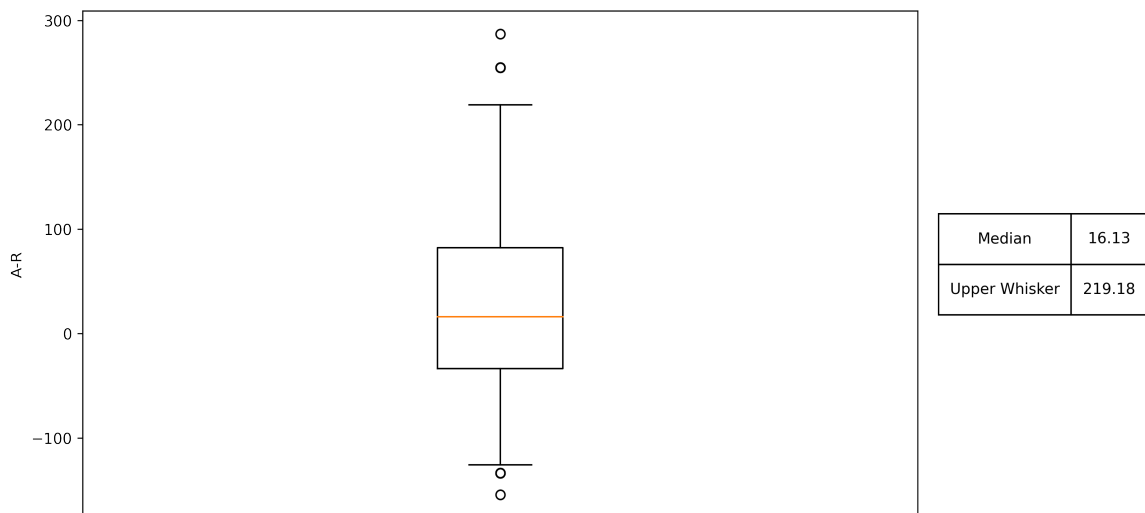
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 15-3. Histogram of A-R for CORN - FODDER/SILAGE fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 15-4. Box and whisker plot of A-R for CORN - FODDER/SILAGE fields in the Coalition.



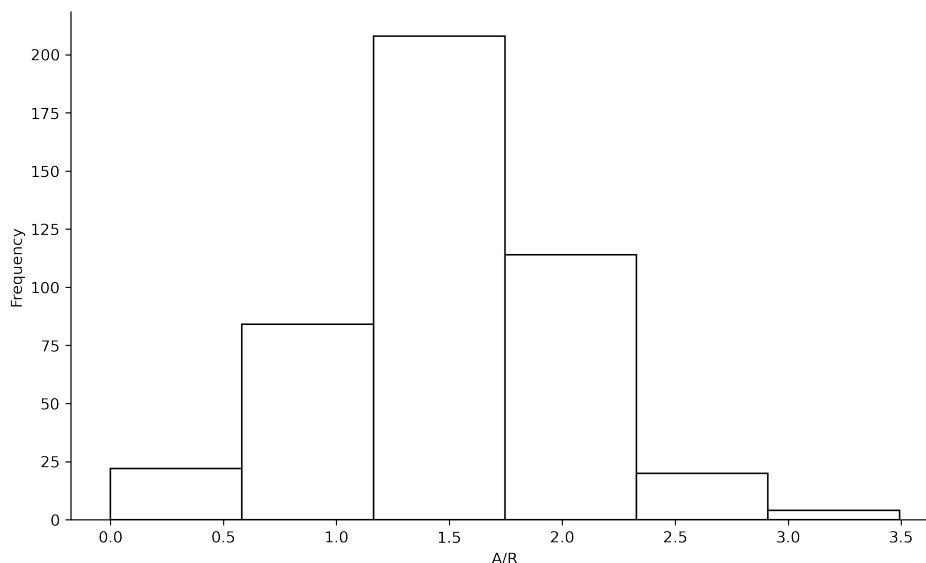
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

16. CORN - GRAIN

Table 16-1. Summary statistics for CORN - GRAIN fields in Coalition.

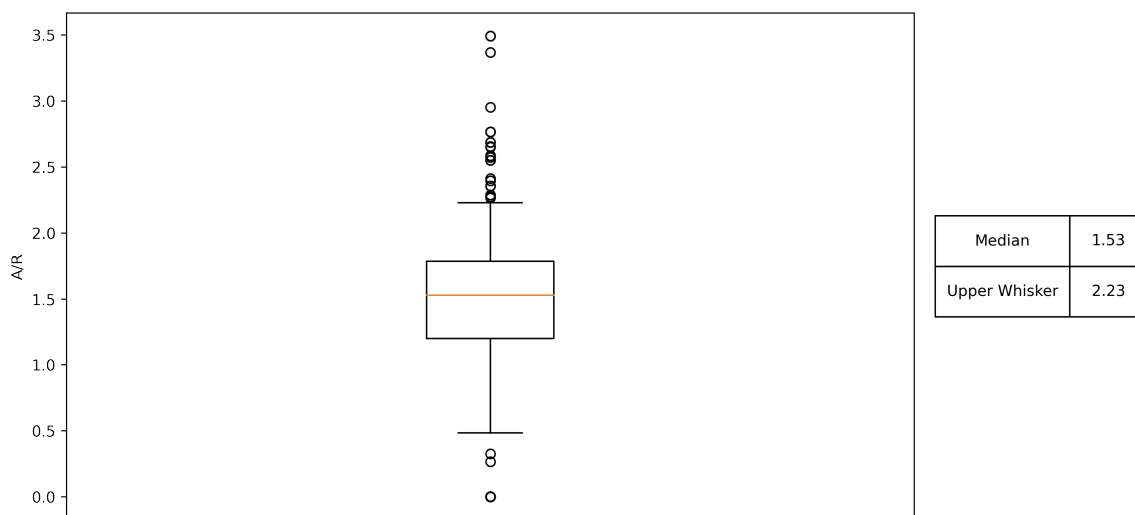
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	454	27974.07	1.53	1.19	0.0	22.66	2.23	29
A-R	454	27974.07	70.27	66.06	-139.9	269.56	179.48	22

Figure 16-1. Histogram of A/R for CORN - GRAIN fields in the Coalition.



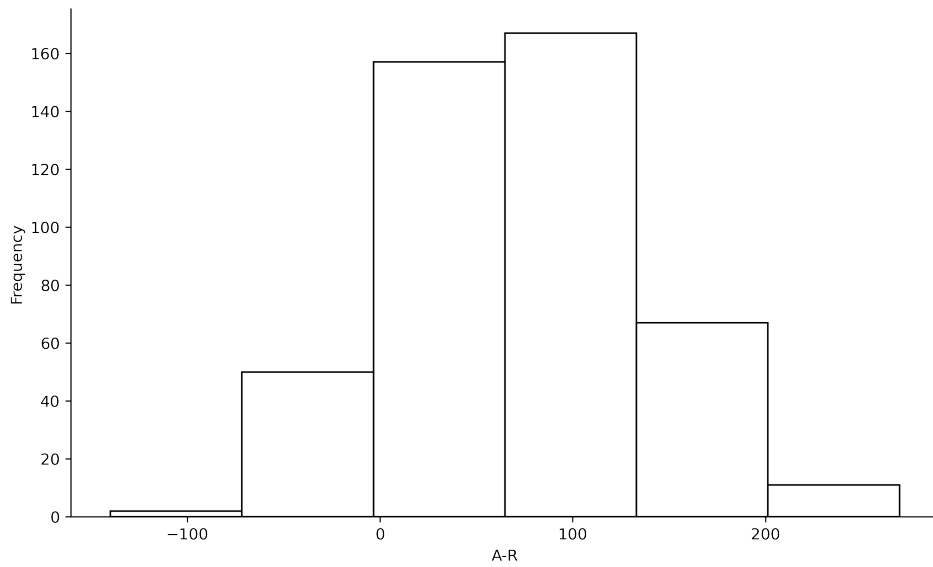
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 16-2. Box and whisker plot of A/R for CORN - GRAIN fields in the Coalition.



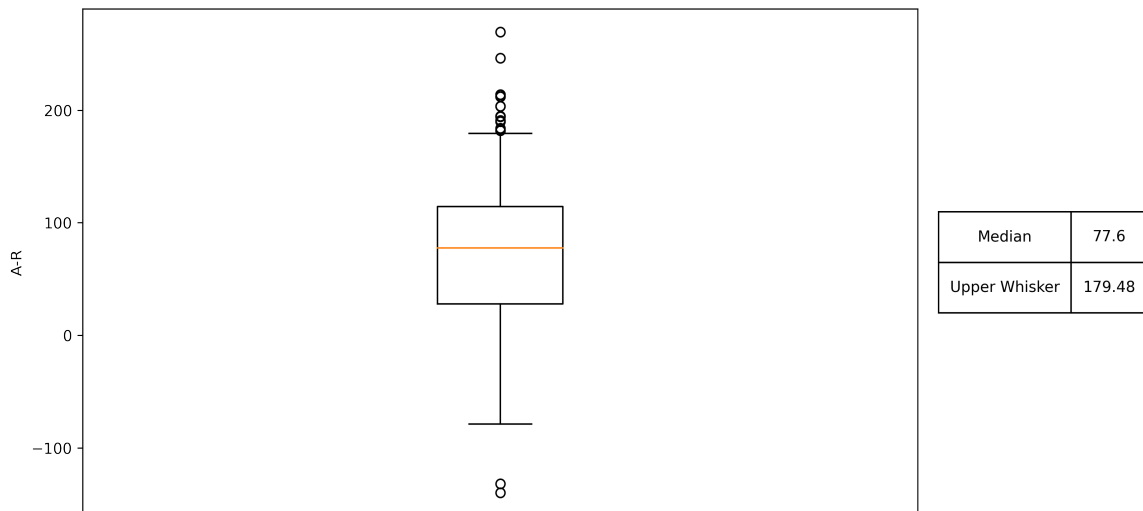
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 16-3. Histogram of A-R for CORN - GRAIN fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 16-4. Box and whisker plot of A-R for CORN - GRAIN fields in the Coalition.



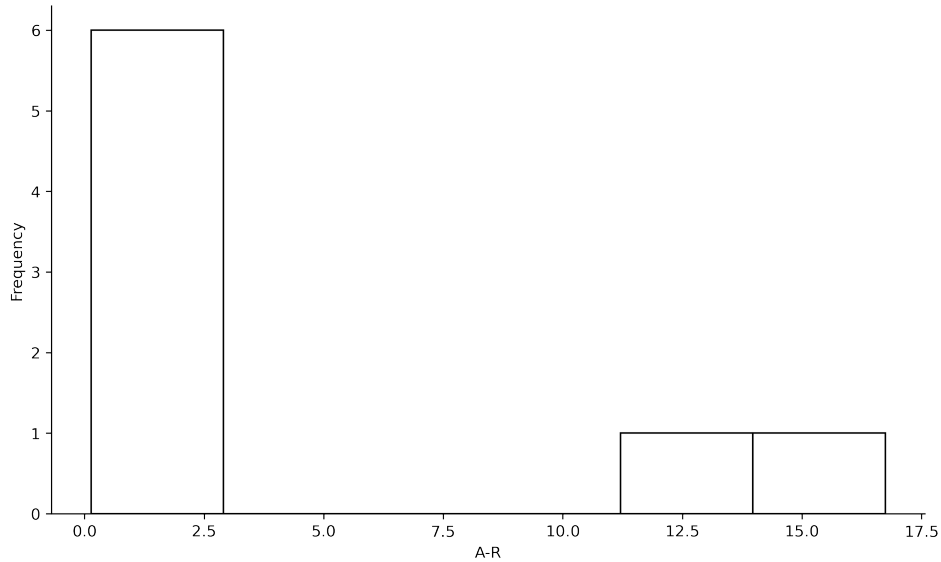
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

17. CORN - NR

Table 17-1. Summary statistics for CORN - NR fields in Coalition.

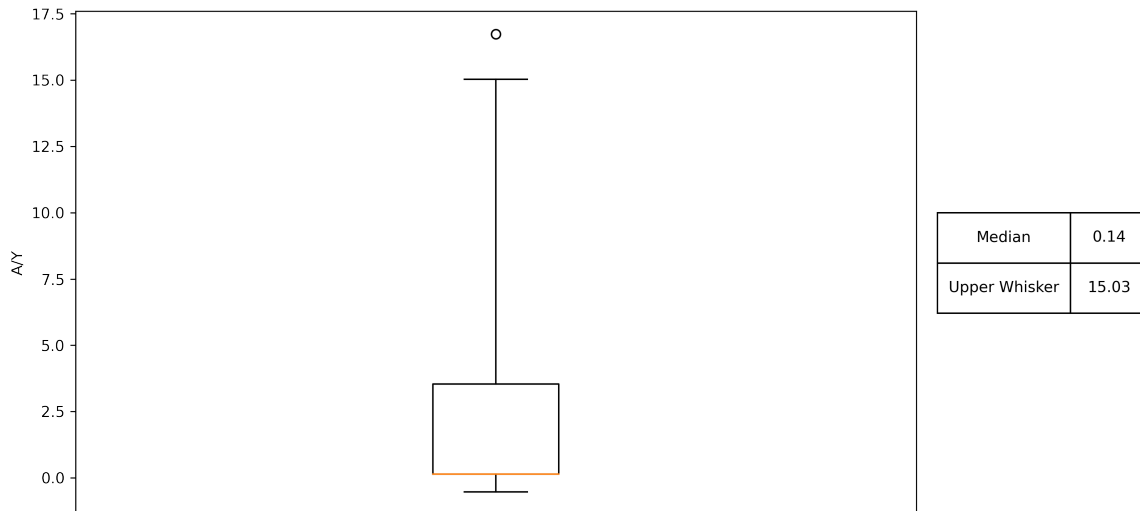
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/Y	8	233.04	3.89	6.97	0.14	16.74	15.03	1

Figure 17-1. Histogram of A/Y for CORN - NR fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot

Figure 17-2. Box and whisker plot of A/Y for CORN - NR fields in the Coalition.



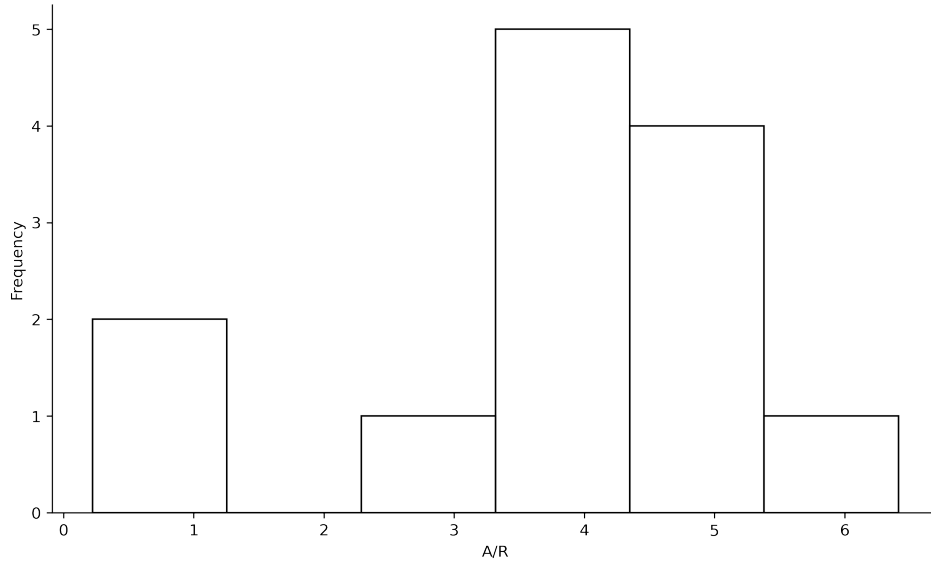
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot
The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

18. CORN - SWEET

Table 18-1. Summary statistics for CORN - SWEET fields in Coalition.

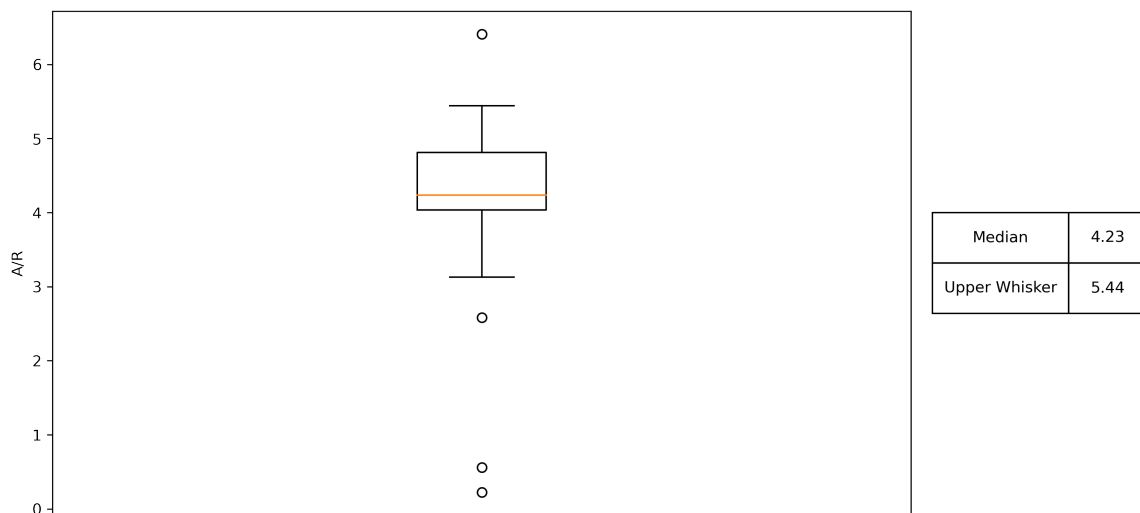
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	13	412.8	3.85	1.74	0.22	6.41	5.44	1
A-R	13	412.8	114.89	107.66	-139.25	218.64	336.62	0

Figure 18-1. Histogram of A/R for CORN - SWEET fields in the Coalition.



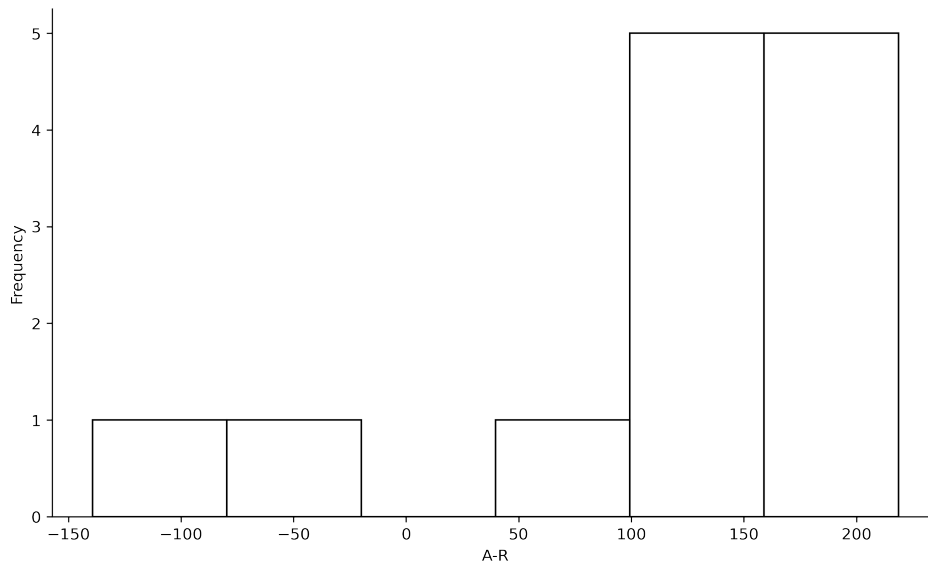
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 18-2. Box and whisker plot of A/R for CORN - SWEET fields in the Coalition.



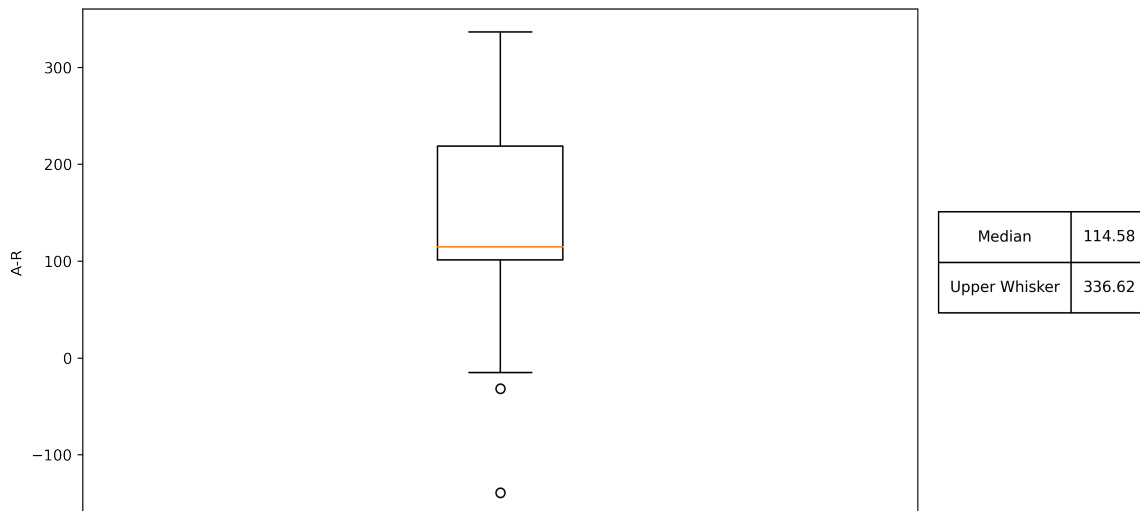
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 18-3. Histogram of A-R for CORN - SWEET fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 18-4. Box and whisker plot of A-R for CORN - SWEET fields in the Coalition.



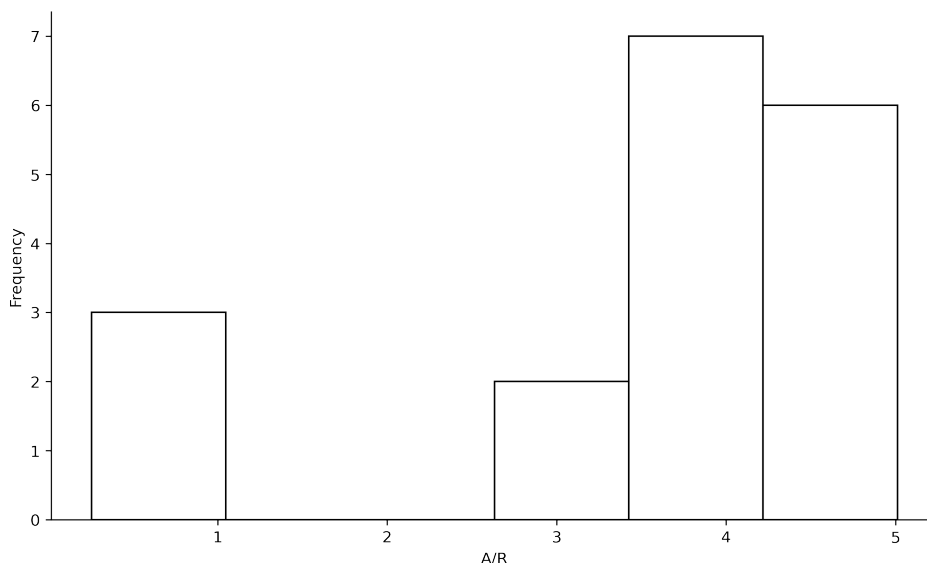
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

19. COTTON

Table 19-1. Summary statistics for COTTON fields in Coalition.

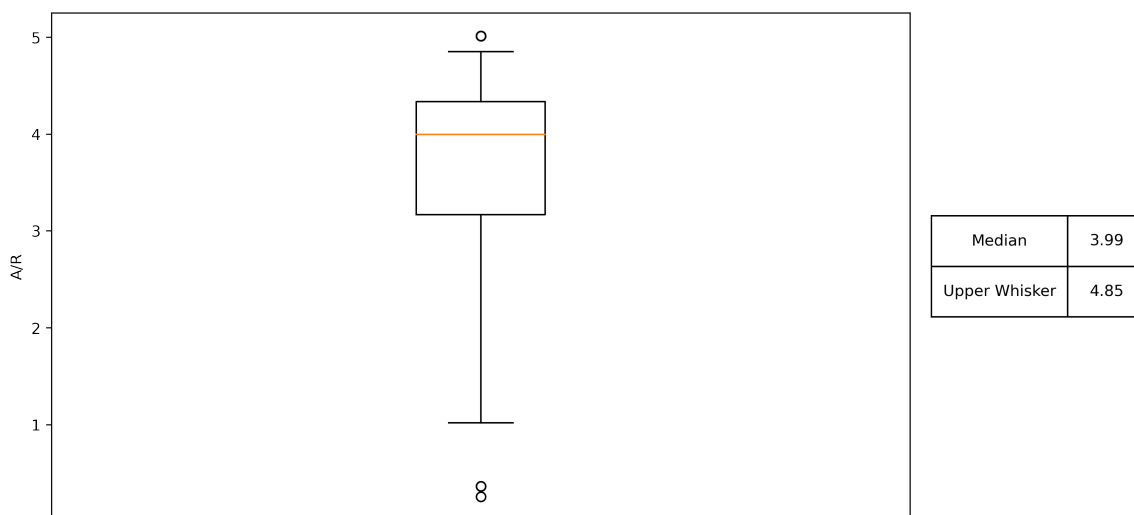
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	22	1881.19	3.44	1.55	0.26	5.01	4.85	3
A-R	22	1881.19	77.82	86.31	-145.3	139.28	150.1	0

Figure 19-1. Histogram of A/R for COTTON fields in the Coalition.



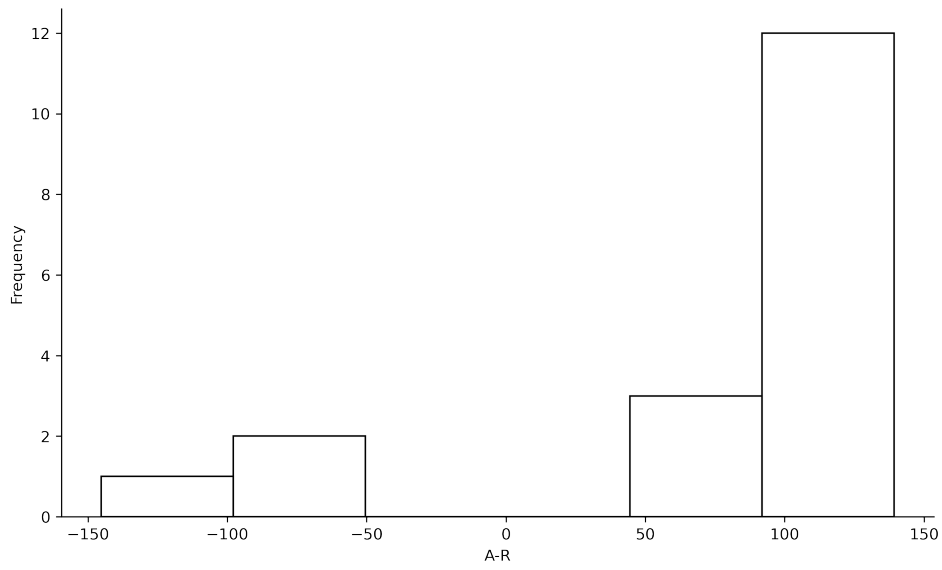
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 19-2. Box and whisker plot of A/R for COTTON fields in the Coalition.



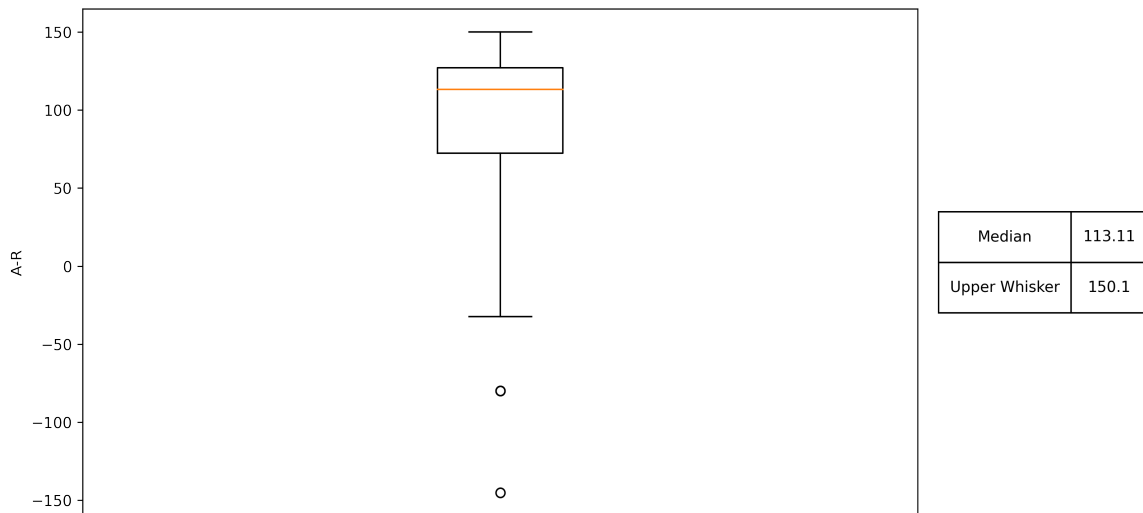
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 19-3. Histogram of A-R for COTTON fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 19-4. Box and whisker plot of A-R for COTTON fields in the Coalition.



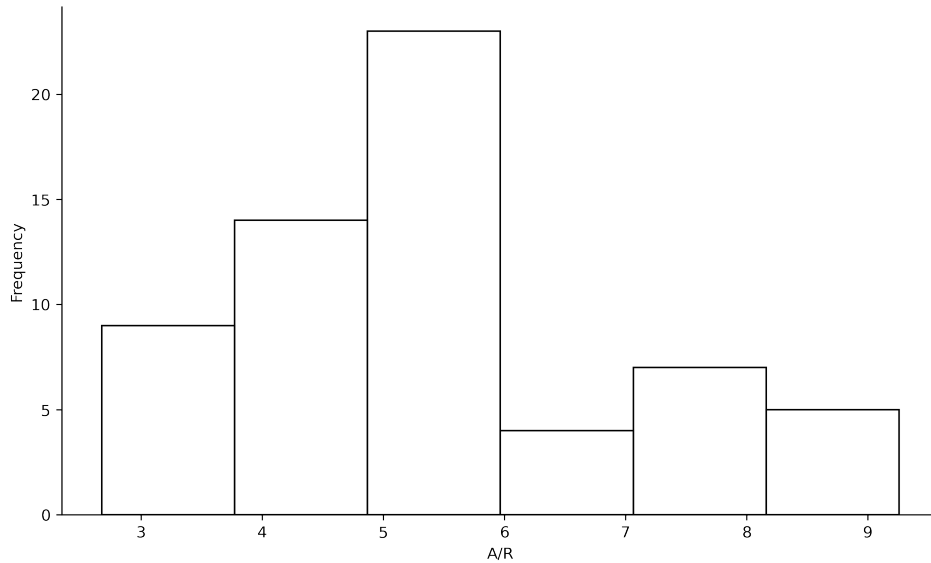
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

20. CUCUMBER

Table 20-1. Summary statistics for CUCUMBER fields in Coalition.

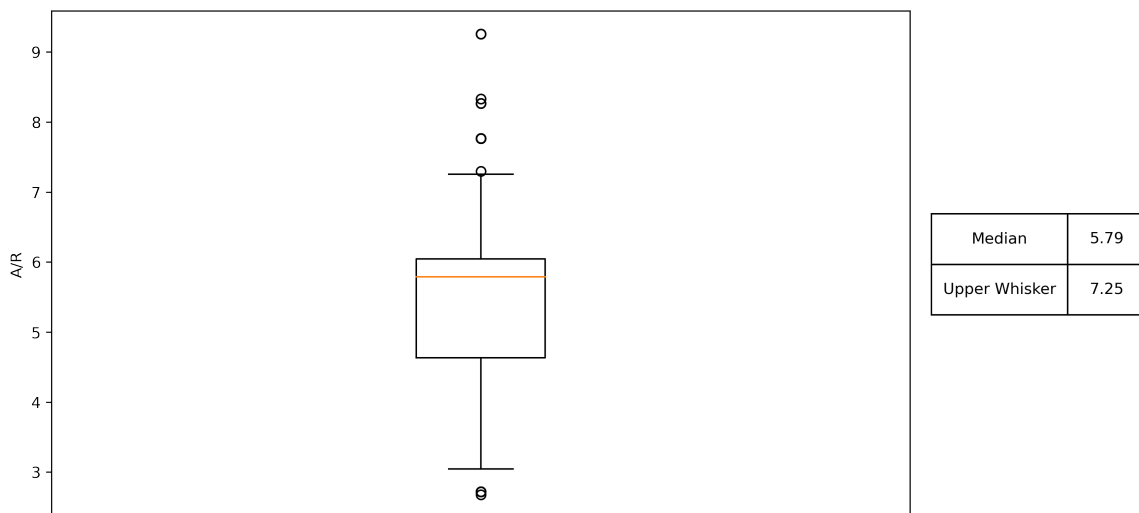
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	62	2353.4	5.61	1.61	2.67	9.26	7.25	12
A-R	62	2353.4	80.17	23.71	29.72	133.8	109.9	9

Figure 20-1. Histogram of A/R for CUCUMBER fields in the Coalition.



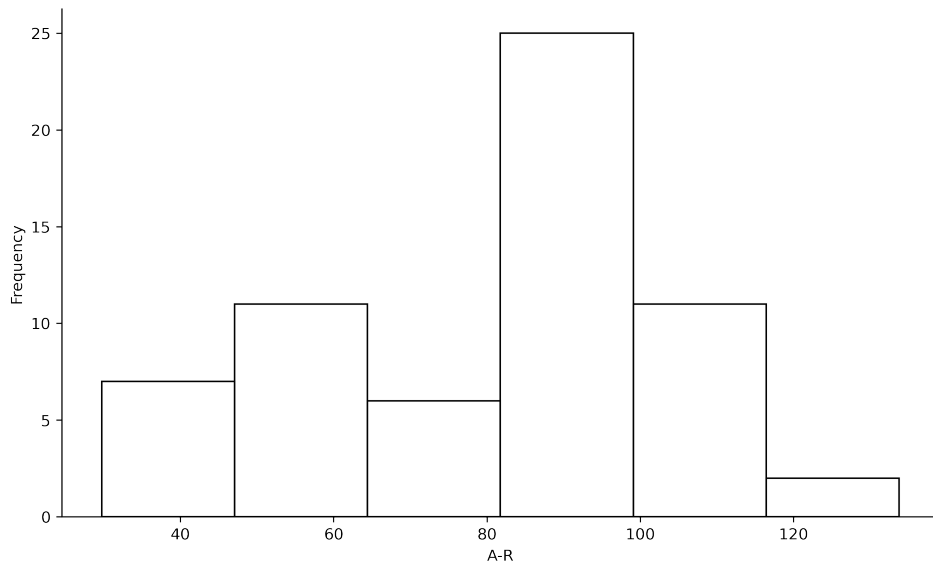
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 20-2. Box and whisker plot of A/R for CUCUMBER fields in the Coalition.



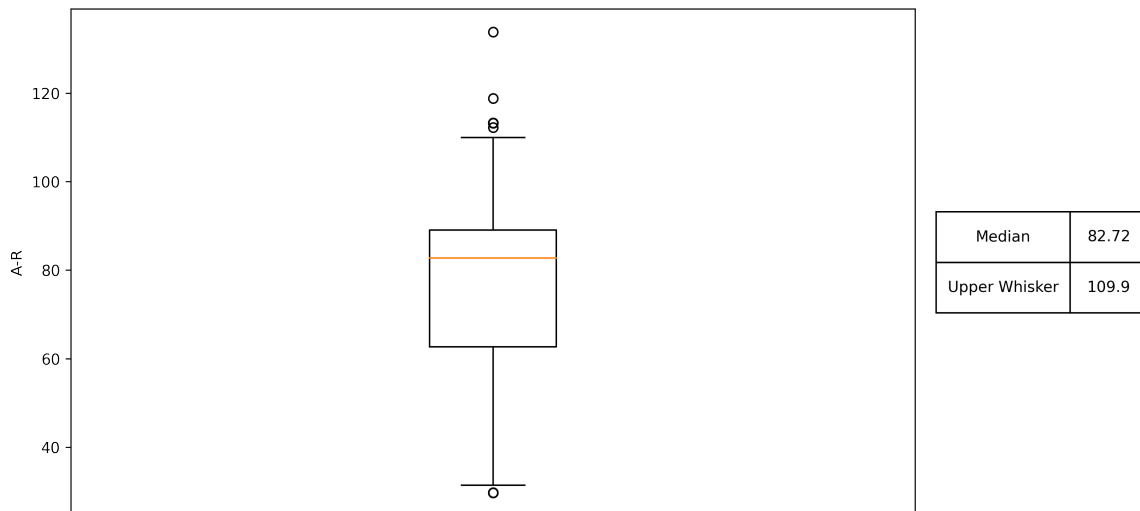
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 20-3. Histogram of A-R for CUCUMBER fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 20-4. Box and whisker plot of A-R for CUCUMBER fields in the Coalition.



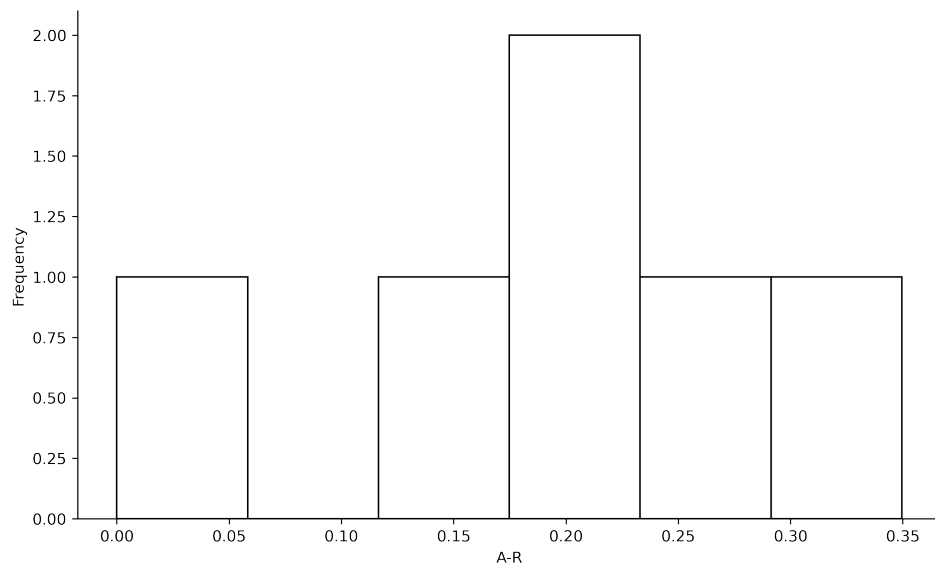
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

21. DICHONDRA

Table 21-1. Summary statistics for DICHONDRA fields in Coalition.

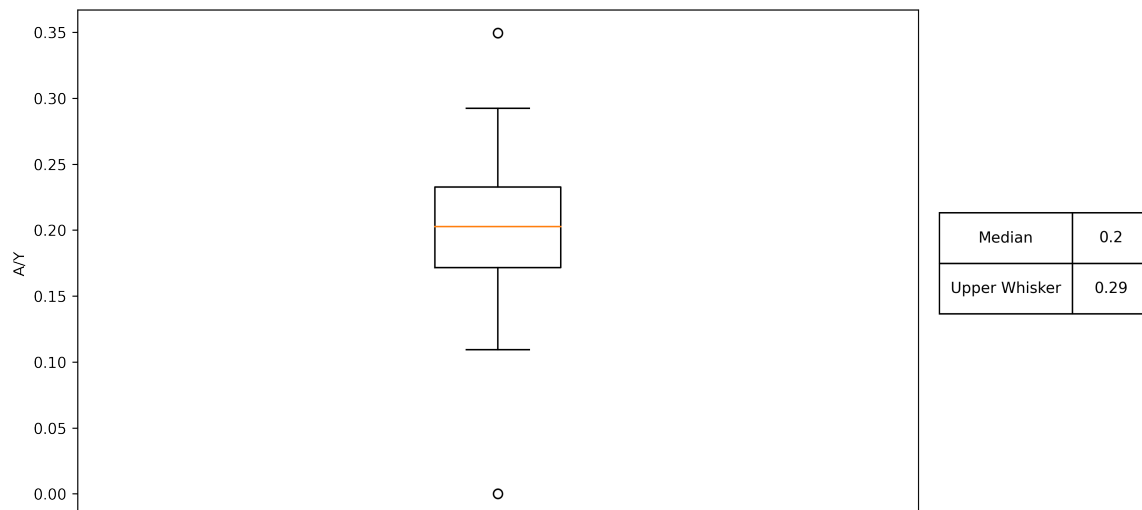
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/Y	6	264.0	0.19	0.11	0.0	0.35	0.29	1

Figure 21-1. Histogram of A/Y for DICHONDRA fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot

Figure 21-2. Box and whisker plot of A/Y for DICHONDRA fields in the Coalition.



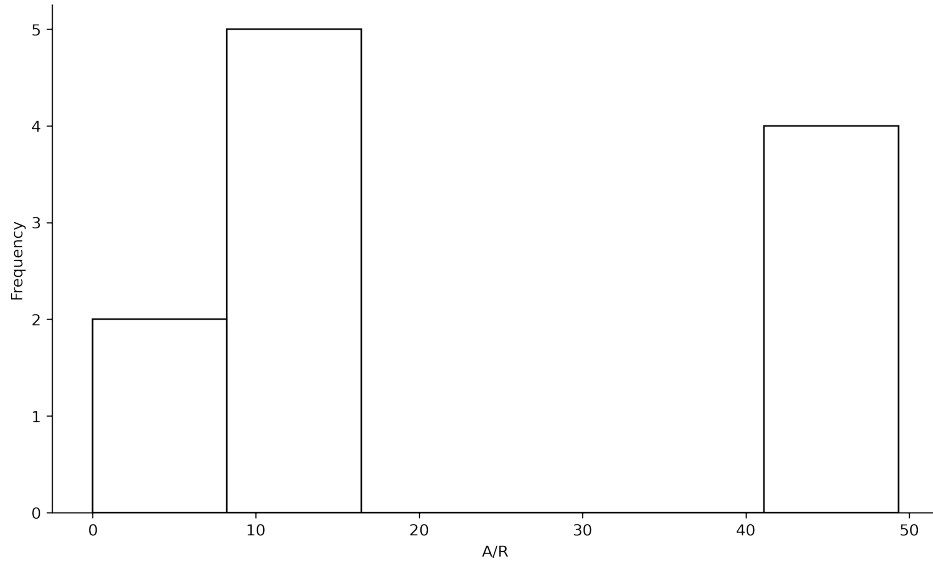
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot
The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

22. FIG

Table 22-1. Summary statistics for FIG fields in Coalition.

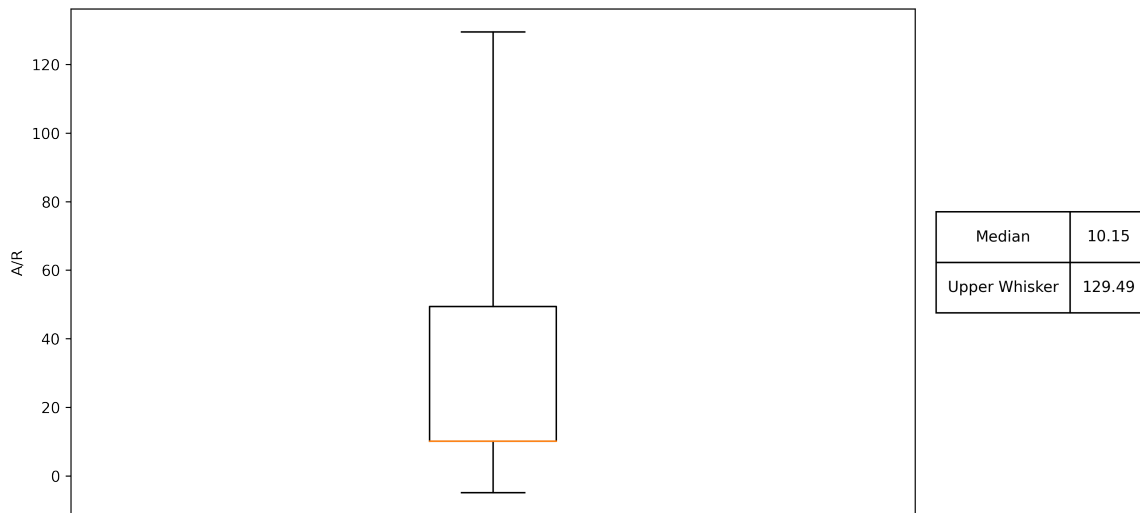
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	12	187.12	22.63	21.53	0.0	49.34	129.49	0
A-R	12	187.12	66.31	42.77	-10.97	109.99	161.51	0

Figure 22-1. Histogram of A/R for FIG fields in the Coalition.



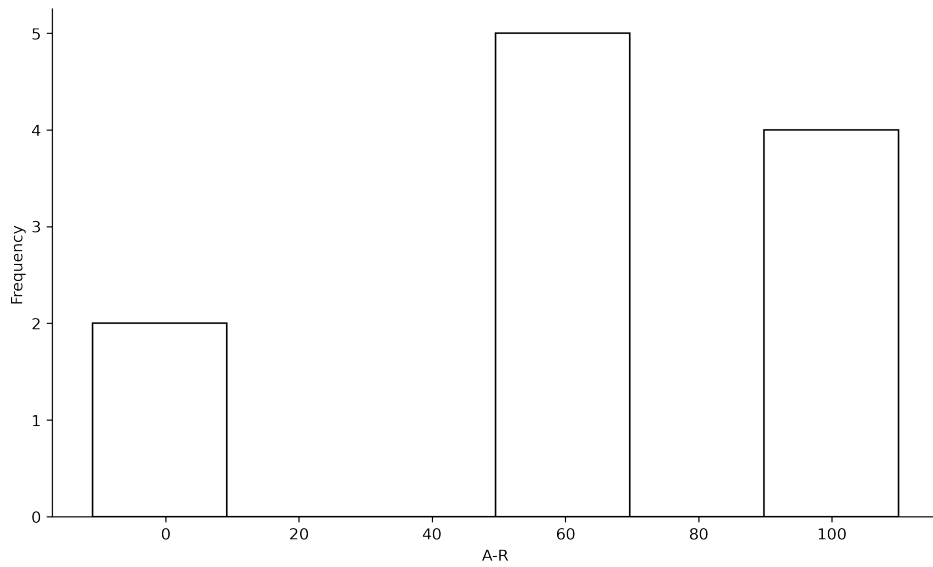
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 22-2. Box and whisker plot of A/R for FIG fields in the Coalition.



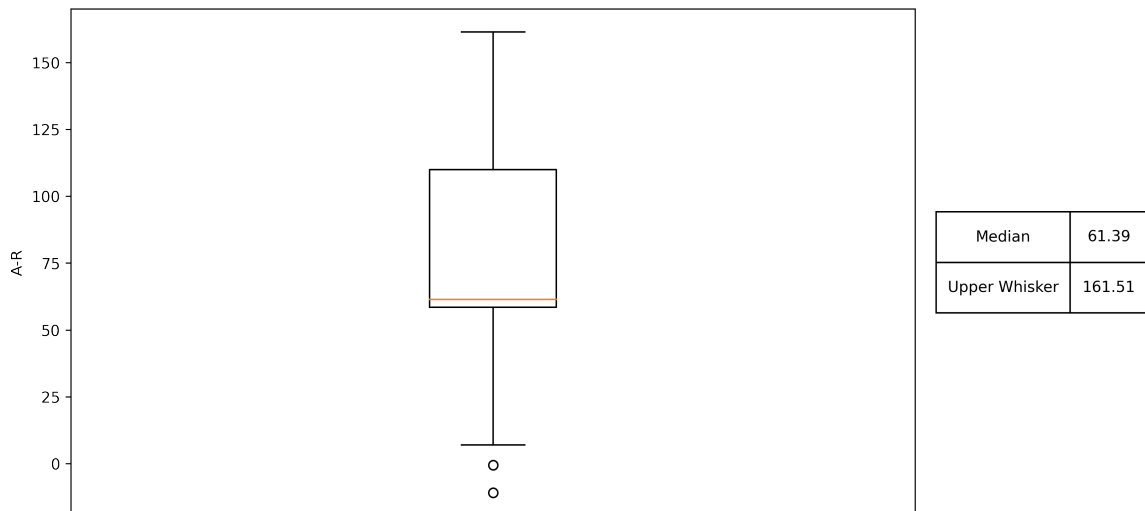
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 22-3. Histogram of A-R for FIG fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 22-4. Box and whisker plot of A-R for FIG fields in the Coalition.



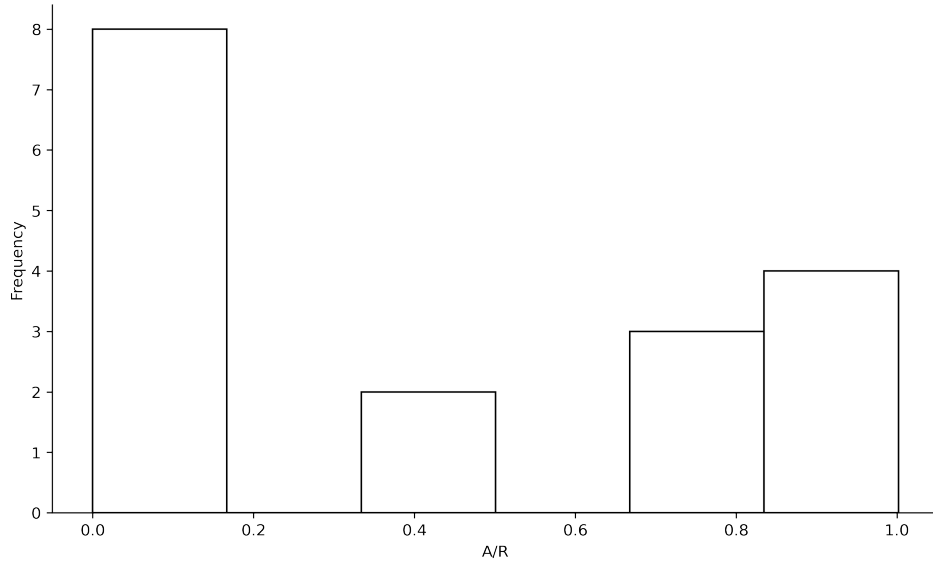
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

23. GRAIN HAY

Table 23-1. Summary statistics for GRAIN HAY fields in Coalition.

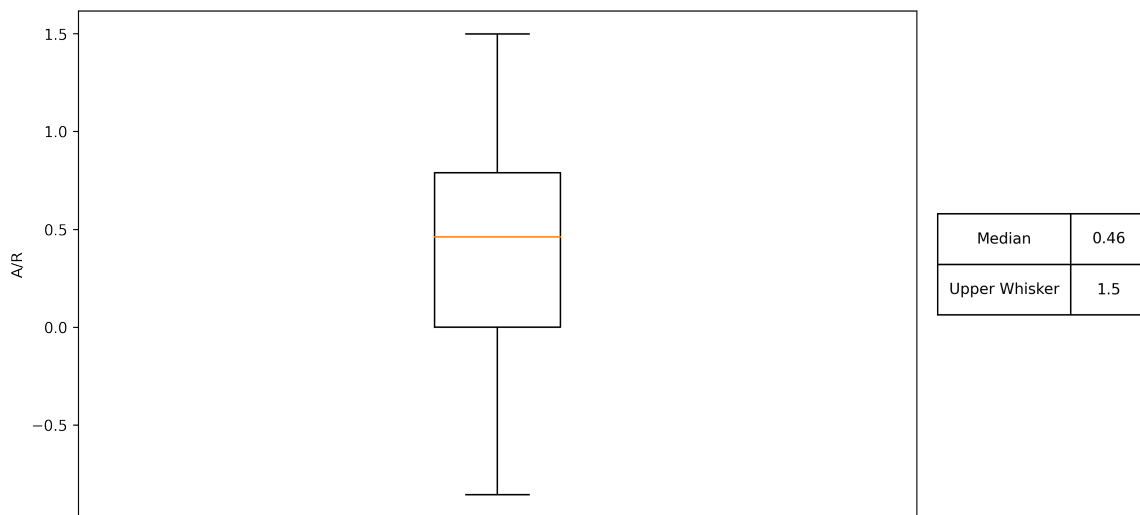
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	17	678.39	0.43	0.41	0.0	1.0	1.5	0
A-R	17	678.39	-41.35	38.28	-130.2	0.18	21.77	0

Figure 23-1. Histogram of A/R for GRAIN HAY fields in the Coalition.



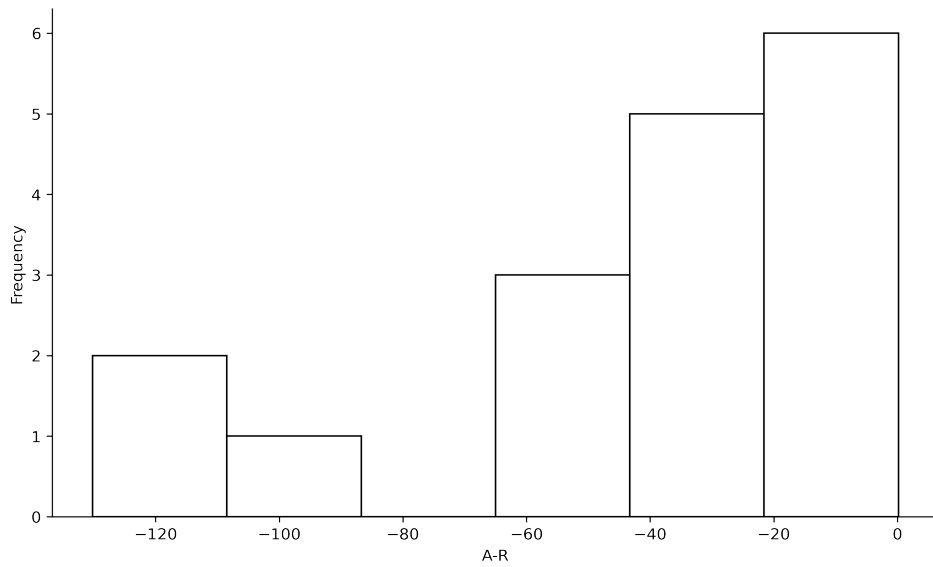
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 23-2. Box and whisker plot of A/R for GRAIN HAY fields in the Coalition.



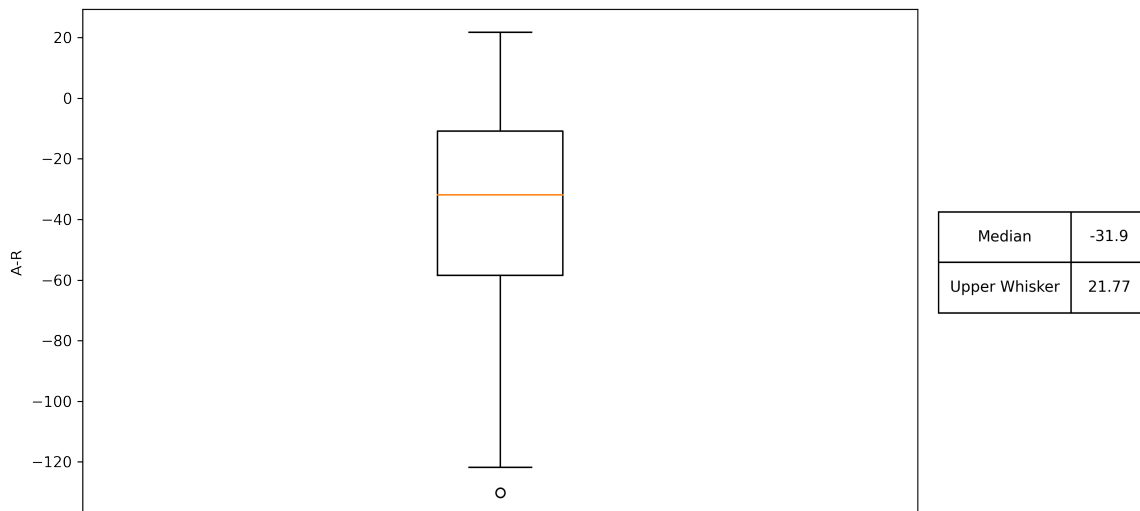
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 23-3. Histogram of A-R for GRAIN HAY fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 23-4. Box and whisker plot of A-R for GRAIN HAY fields in the Coalition.



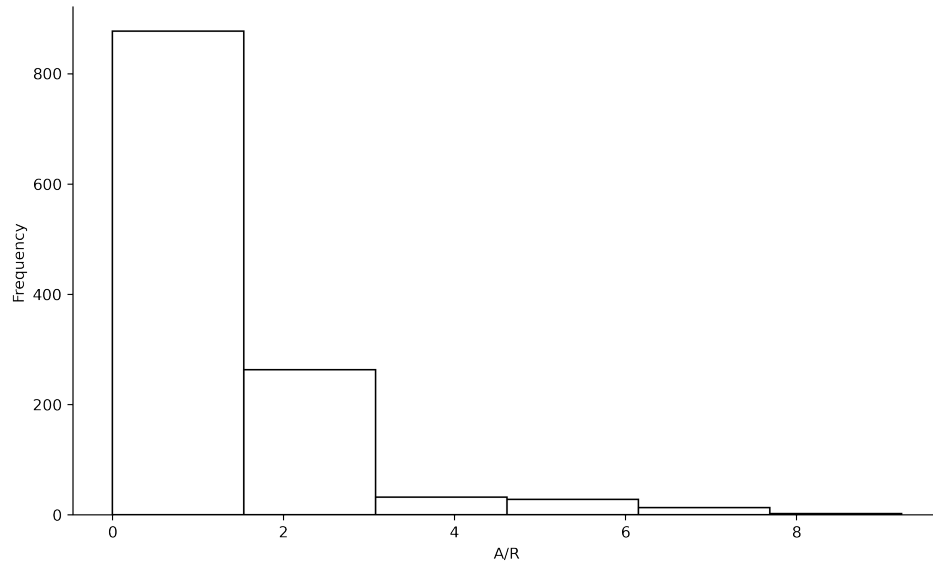
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

24. GRAPE - WINE

Table 24-1. Summary statistics for GRAPE - WINE fields in Coalition.

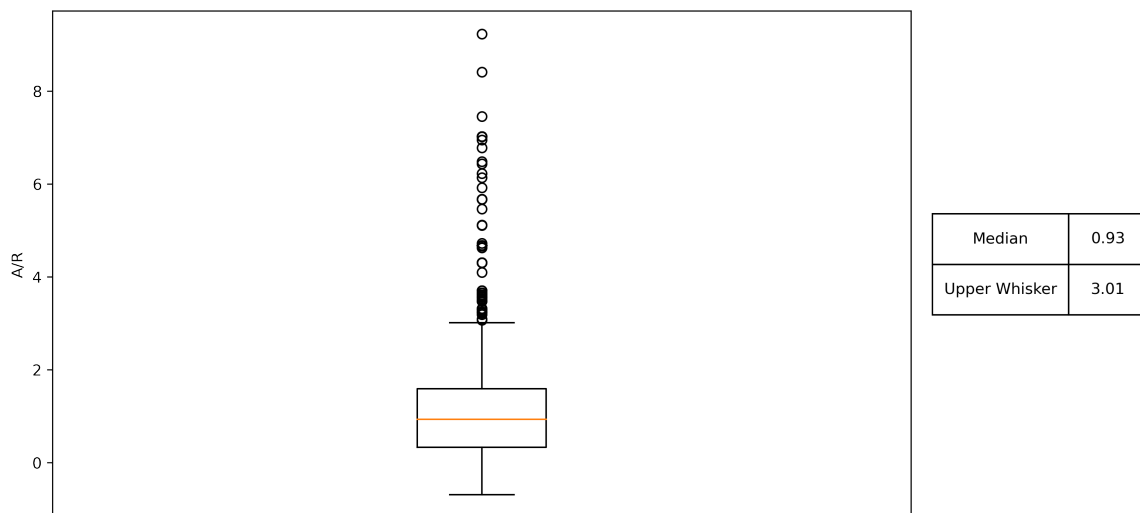
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	1229	62229.21	1.48	3.91	0.0	89.73	3.01	90
A-R	1229	62229.21	2.15	21.68	-72.0	272.75	43.51	29

Figure 24-1. Histogram of A/R for GRAPE - WINE fields in the Coalition.



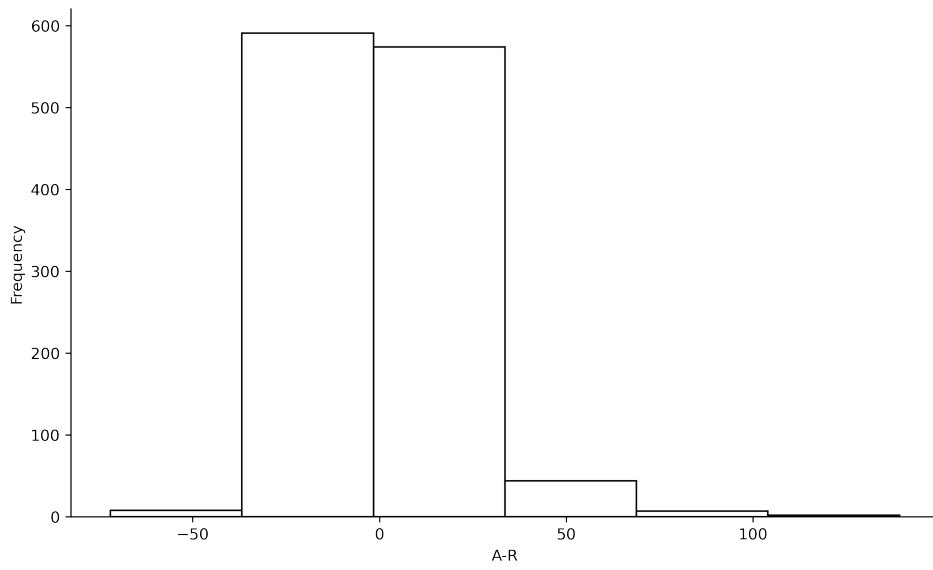
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 24-2. Box and whisker plot of A/R for GRAPE - WINE fields in the Coalition.



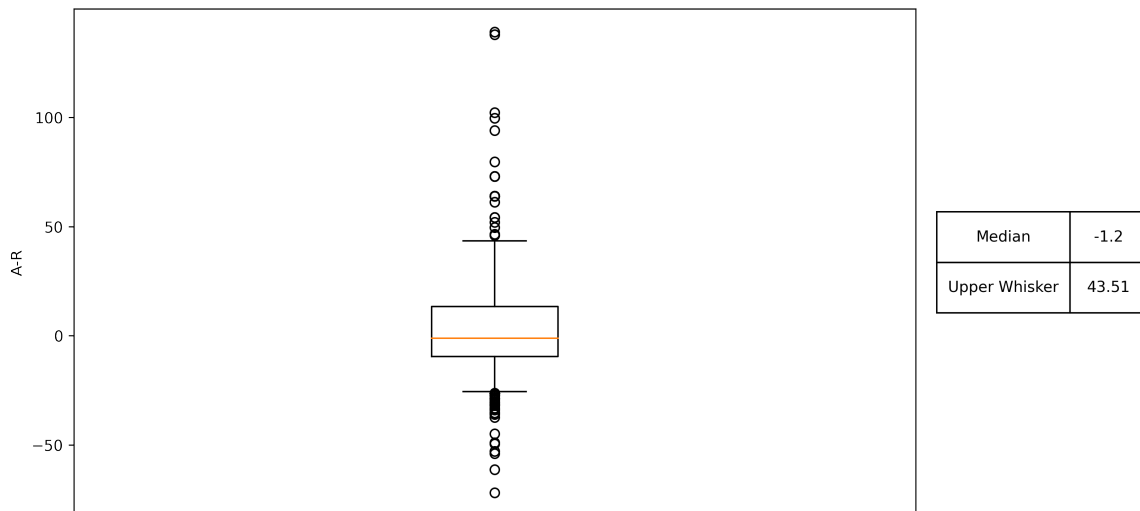
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 24-3. Histogram of A-R for GRAPE - WINE fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 24-4. Box and whisker plot of A-R for GRAPE - WINE fields in the Coalition.



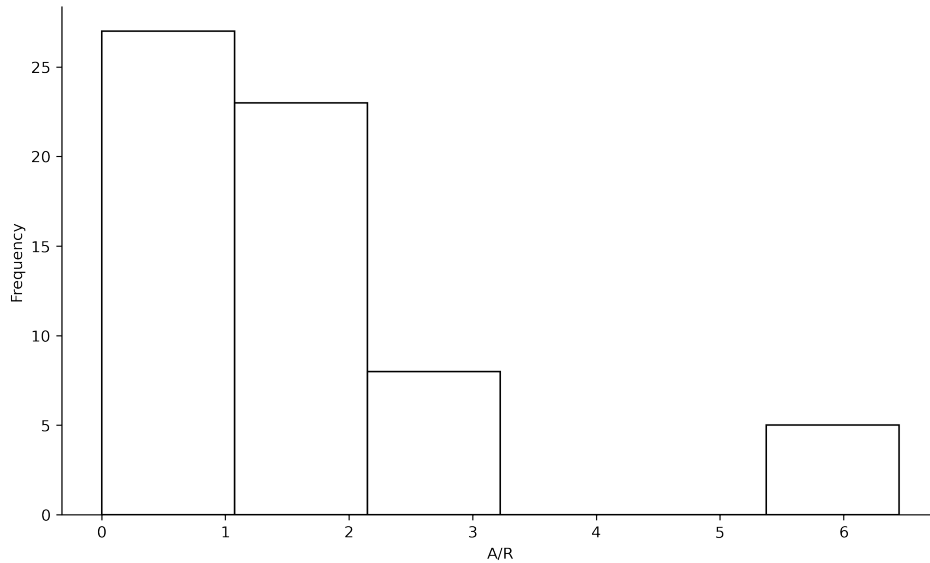
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

25. GRAPE - WINE-YOUNG

Table 25-1. Summary statistics for GRAPE - WINE-YOUNG fields in Coalition.

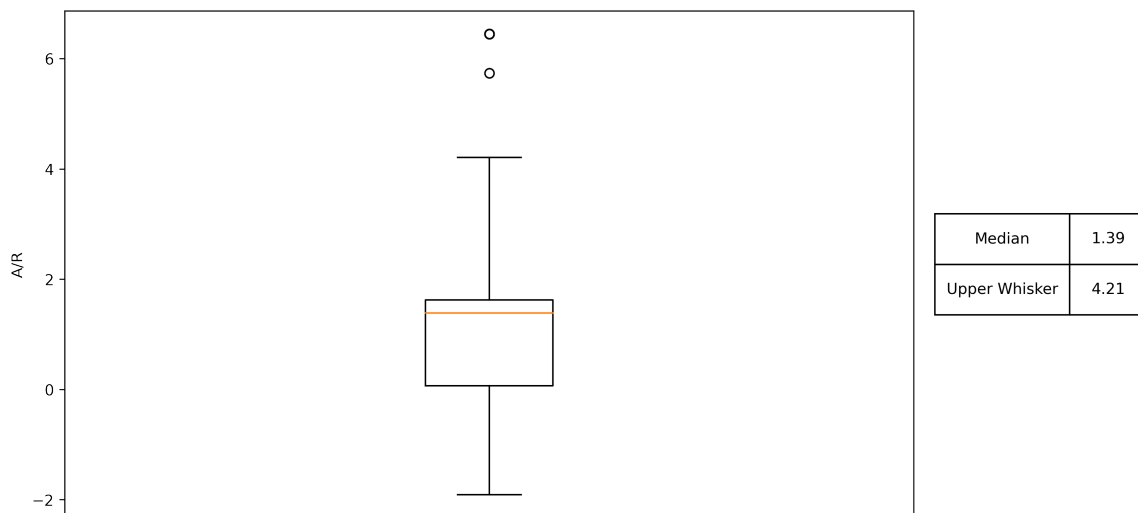
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	68	2689.52	5.17	13.21	0.0	51.39	4.21	--
A-R	68	2689.52	5.14	17.74	-53.7	50.47	32.61	--

Figure 25-1. Histogram of A/R for GRAPE - WINE-YOUNG fields in the Coalition.



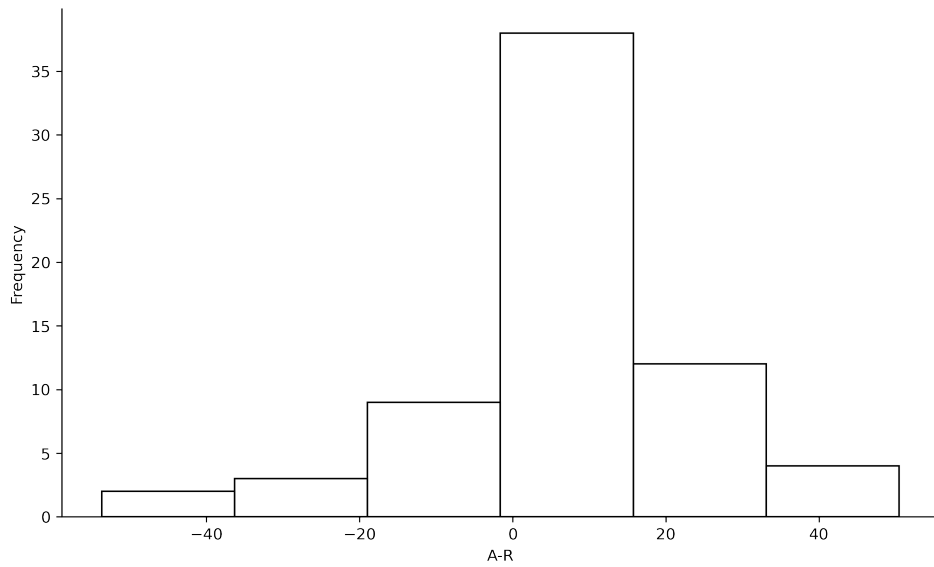
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 25-2. Box and whisker plot of A/R for GRAPE - WINE-YOUNG fields in the Coalition.



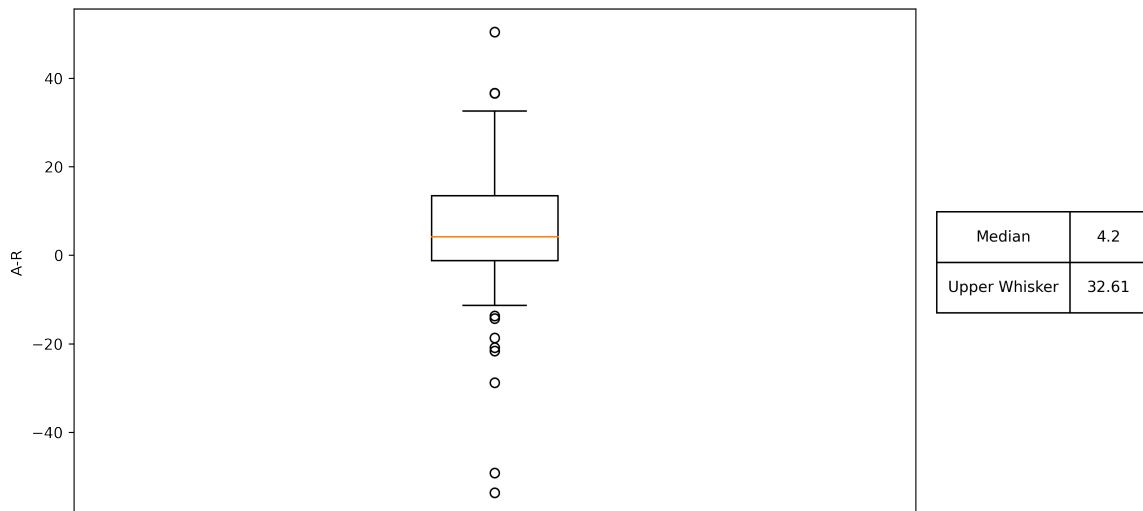
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 25-3. Histogram of A-R for GRAPE - WINE-YOUNG fields in the Coalition.



Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 25-4. Box and whisker plot of A-R for GRAPE - WINE-YOUNG fields in the Coalition.



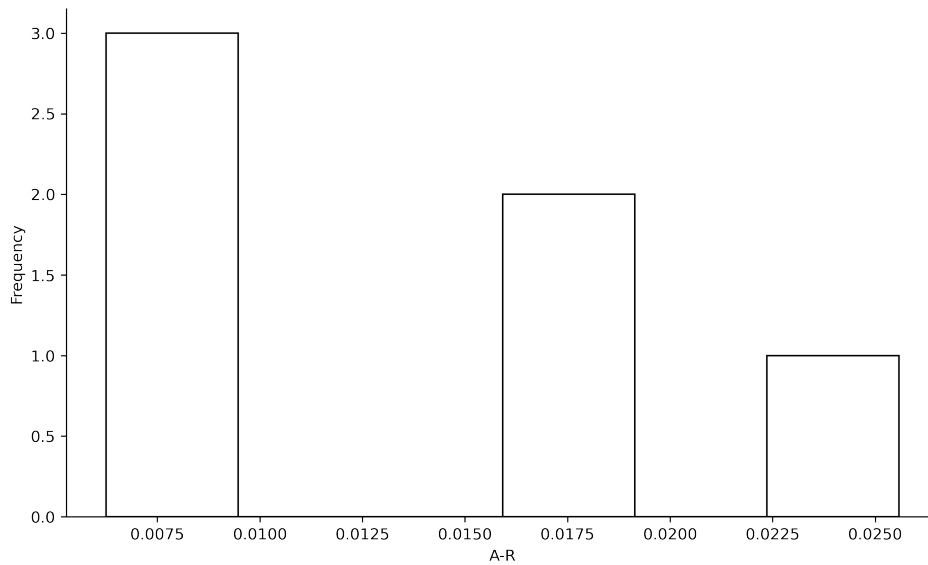
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

26. GRAPE ROOTSTOCK

Table 26-1. Summary statistics for GRAPE ROOTSTOCK fields in Coalition.

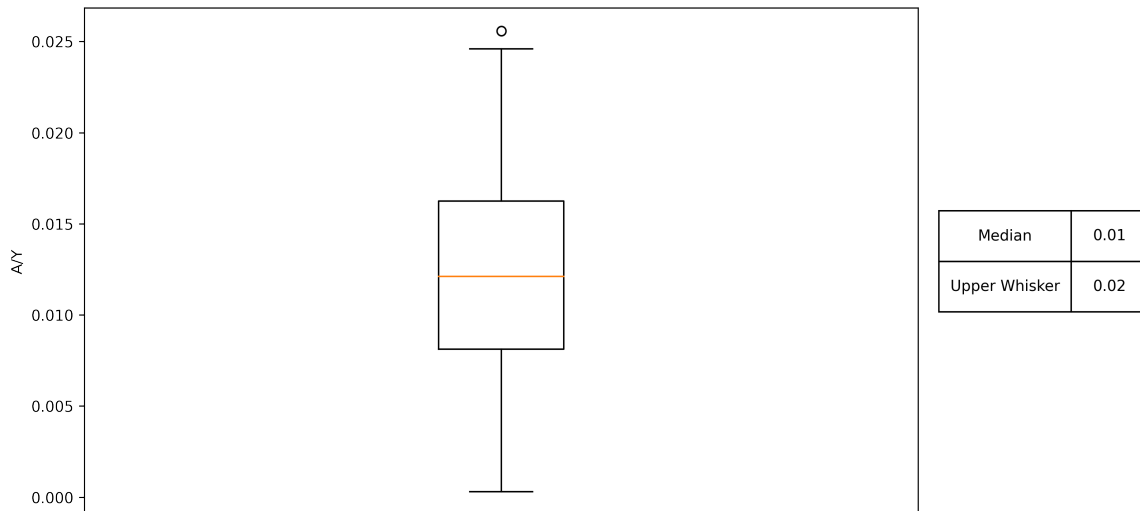
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/Y	7	224.0	0.01	0.01	0.01	0.03	0.02	1

Figure 26-1. Histogram of A/Y for GRAPE ROOTSTOCK fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot

Figure 26-2. Box and whisker plot of A/Y for GRAPE ROOTSTOCK fields in the Coalition.



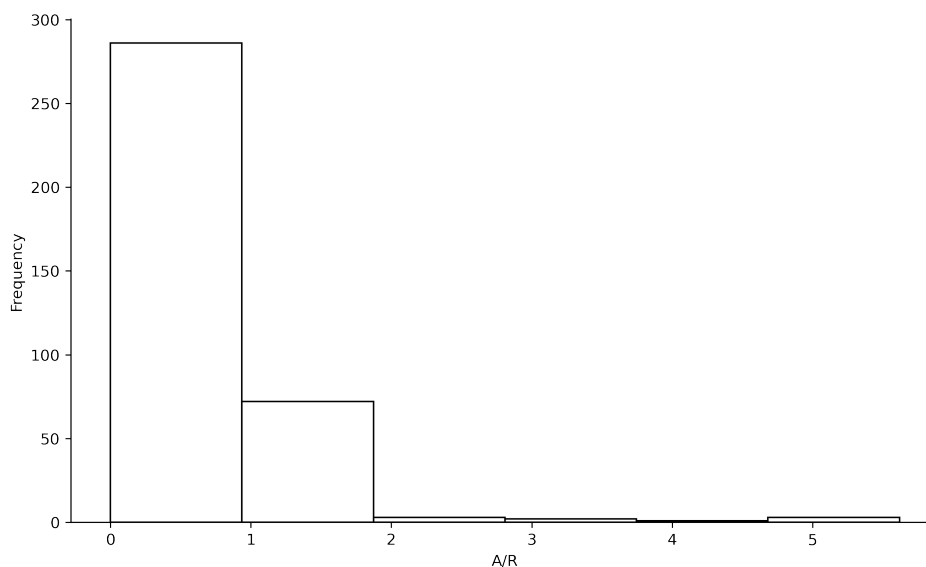
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot
The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

27. HAY/FORAGE

Table 27-1. Summary statistics for HAY/FORAGE fields in Coalition.

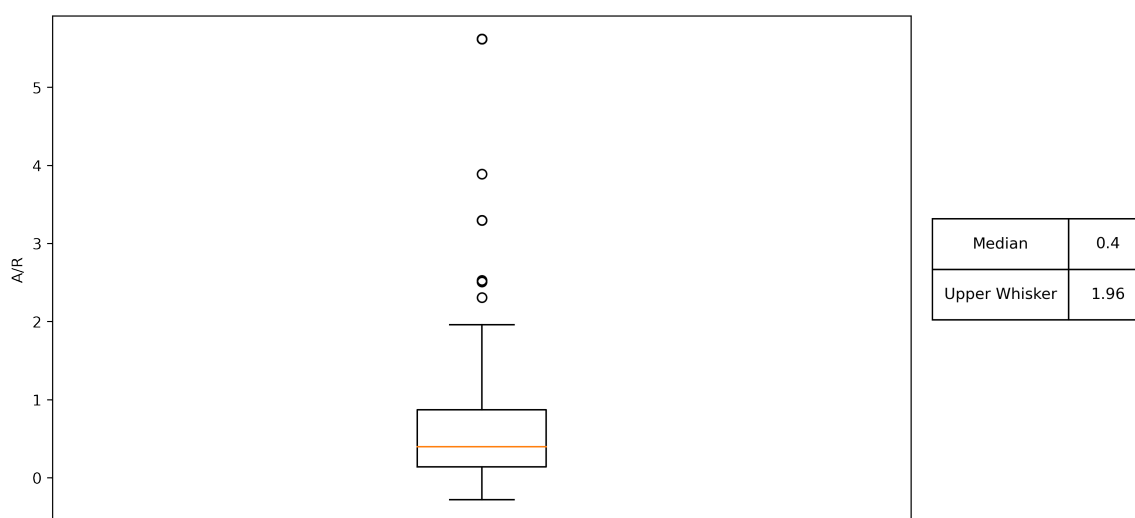
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	367	18011.41	0.58	0.7	0.0	5.62	1.96	9
A-R	367	18011.41	-109.93	155.36	-1323.5	493.2	163.44	3

Figure 27-1. Histogram of A/R for HAY/FORAGE fields in the Coalition.



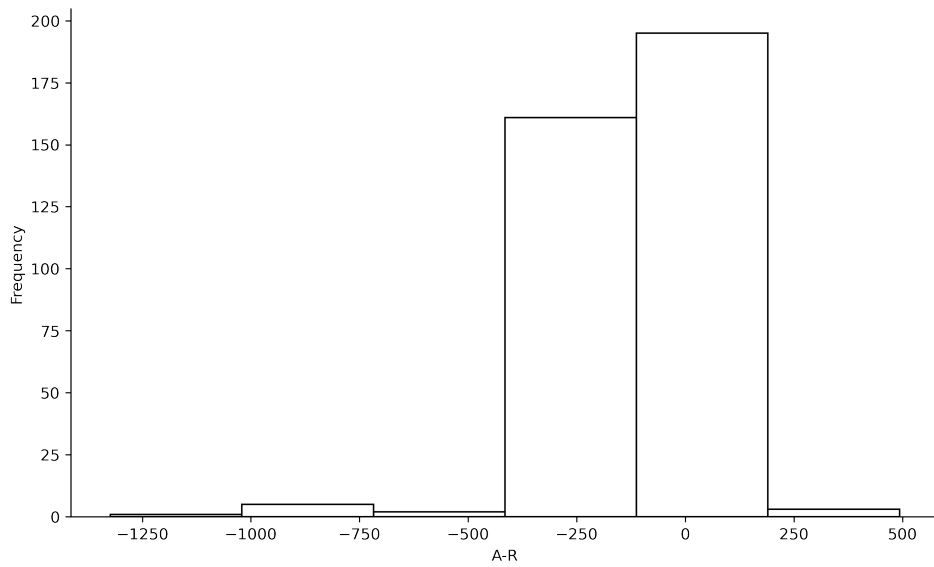
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 27-2. Box and whisker plot of A/R for HAY/FORAGE fields in the Coalition.



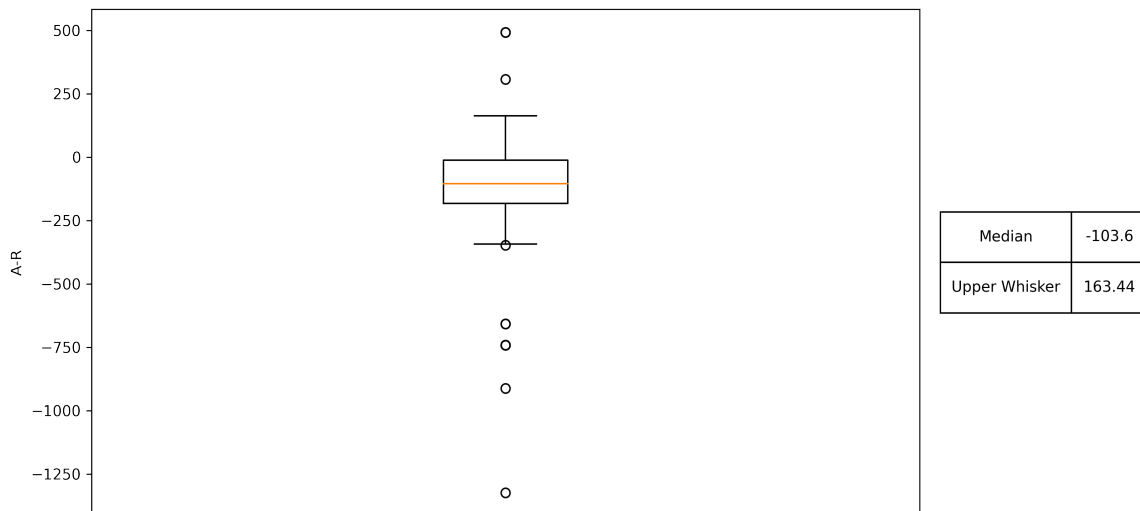
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 27-3. Histogram of A-R for HAY/FORAGE fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 27-4. Box and whisker plot of A-R for HAY/FORAGE fields in the Coalition.



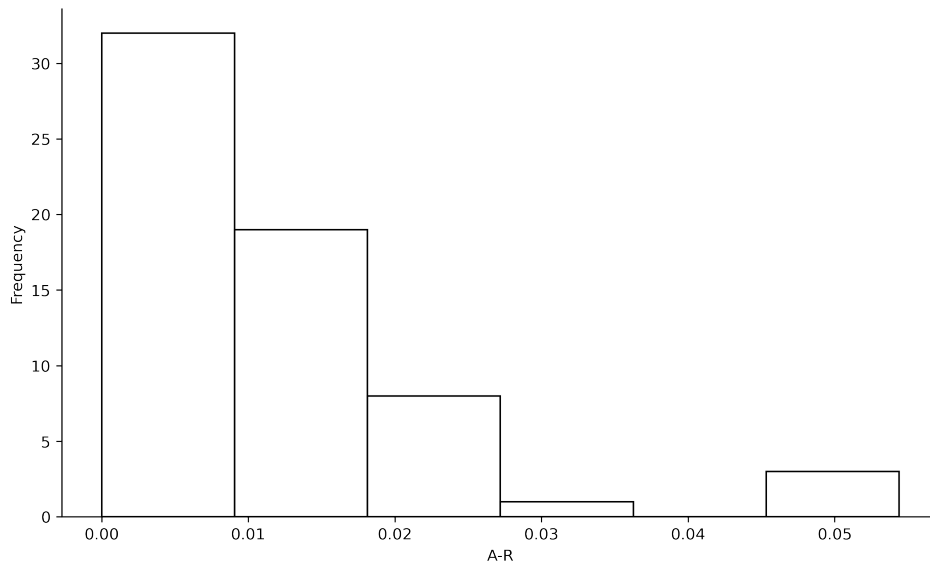
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

28. KIWI

Table 28-1. Summary statistics for KIWI fields in Coalition.

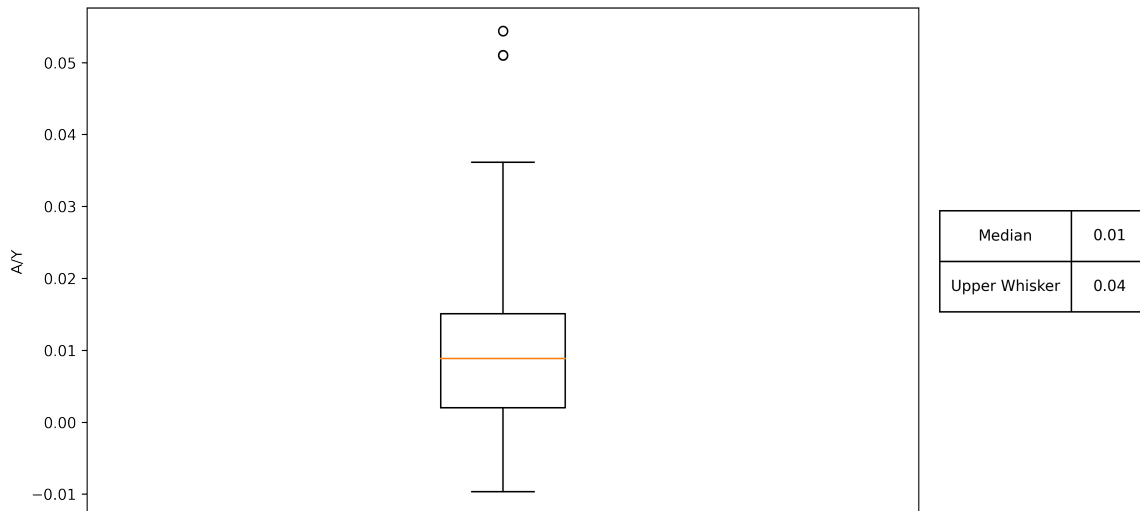
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/Y	65	802.36	0.02	0.04	0.0	0.25	0.04	5

Figure 28-1. Histogram of A/Y for KIWI fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot

Figure 28-2. Box and whisker plot of A/Y for KIWI fields in the Coalition.



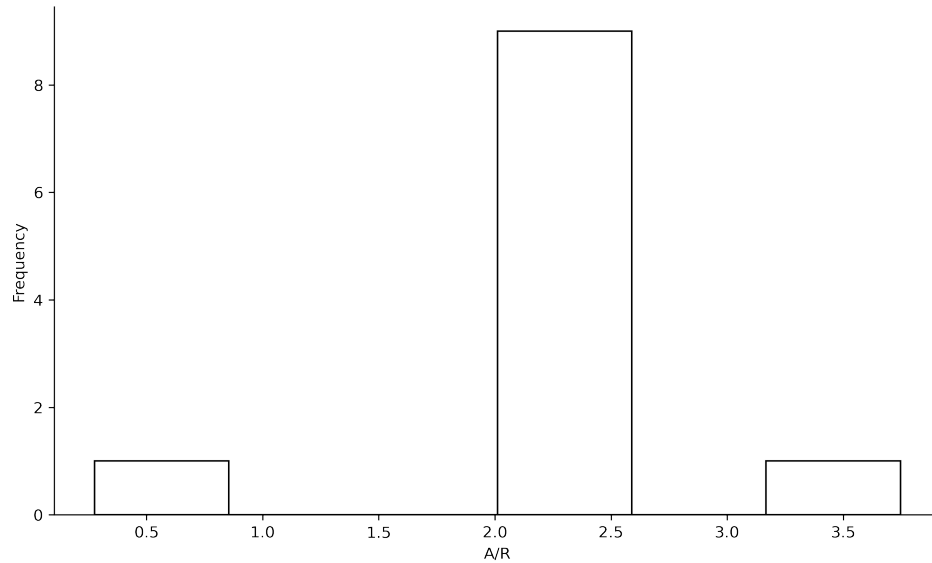
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot
The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

29. MELON

Table 29-1. Summary statistics for MELON fields in Coalition.

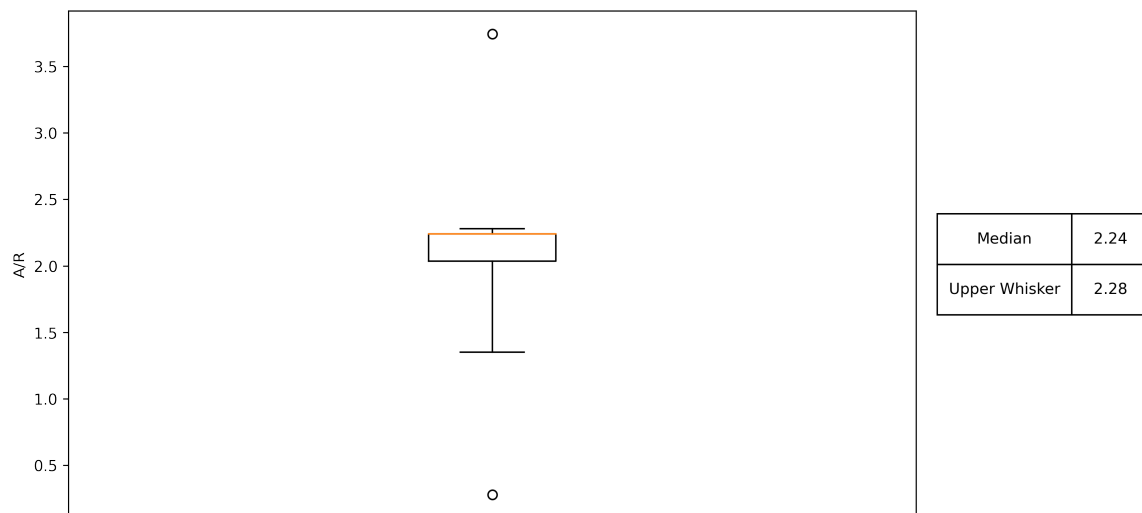
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	11	922.0	2.12	0.78	0.28	3.75	2.28	1
A-R	11	922.0	52.83	23.27	-11.1	84.3	62.86	1

Figure 29-1. Histogram of A/R for MELON fields in the Coalition.



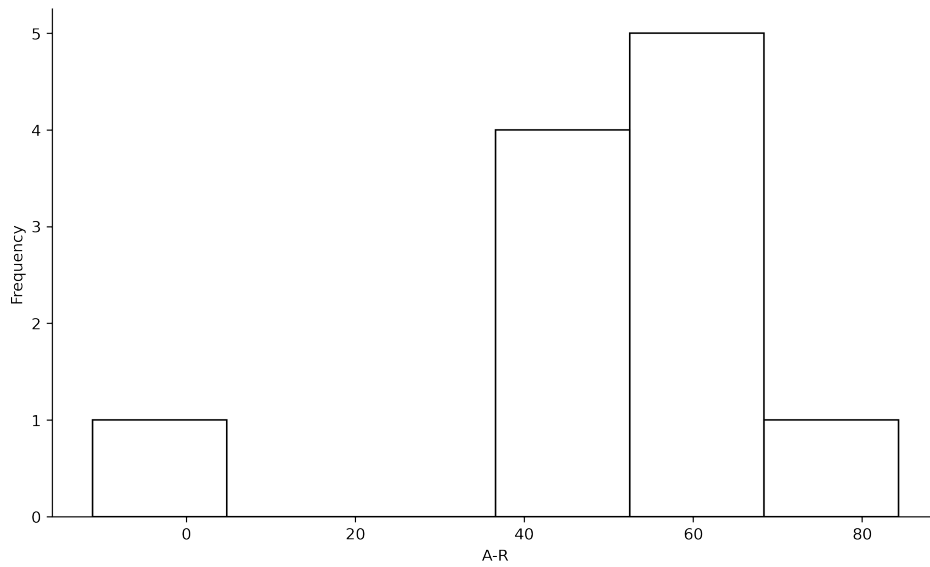
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 29-2. Box and whisker plot of A/R for MELON fields in the Coalition.



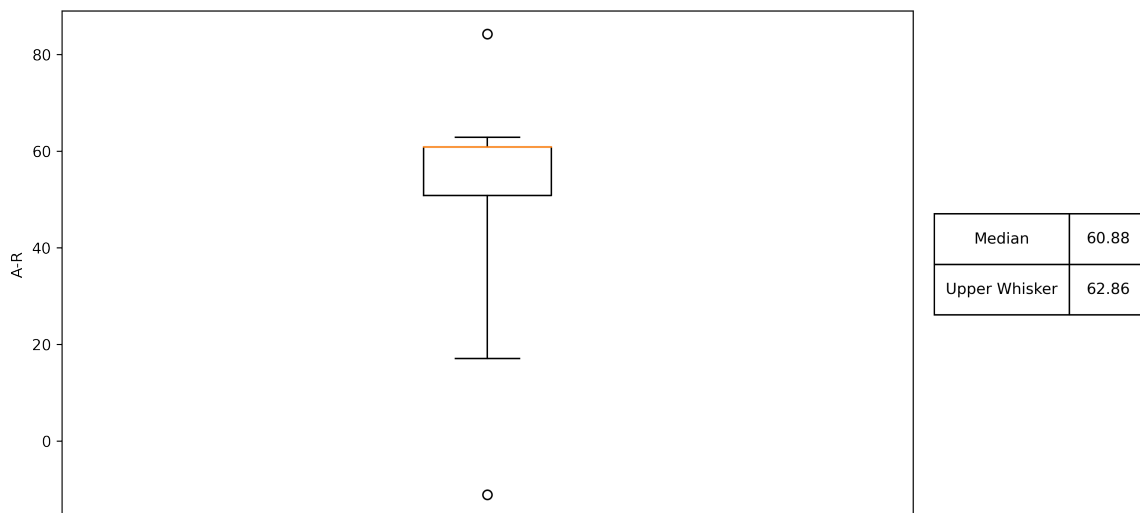
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 29-3. Histogram of A-R for MELON fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 29-4. Box and whisker plot of A-R for MELON fields in the Coalition.



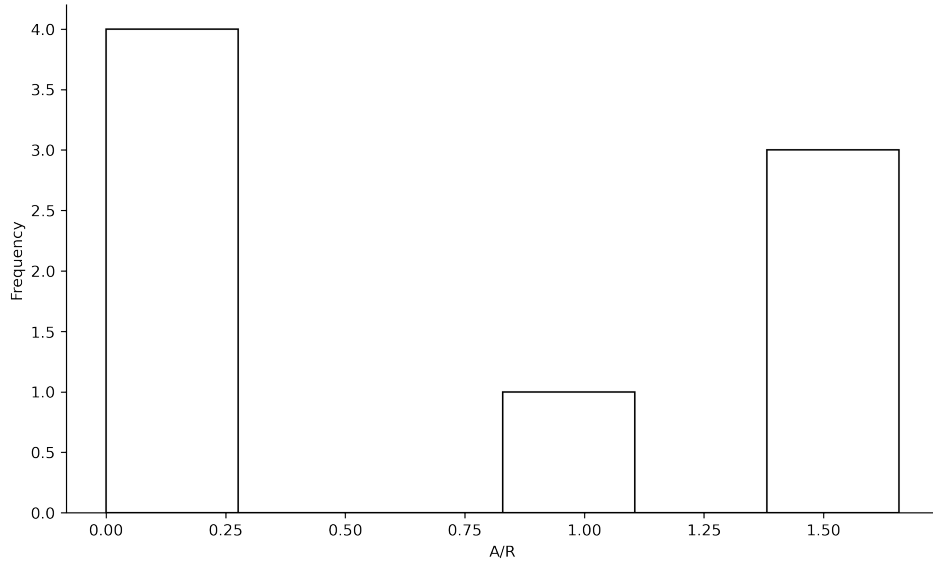
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

30. OAT - GRAIN

Table 30-1. Summary statistics for OAT - GRAIN fields in Coalition.

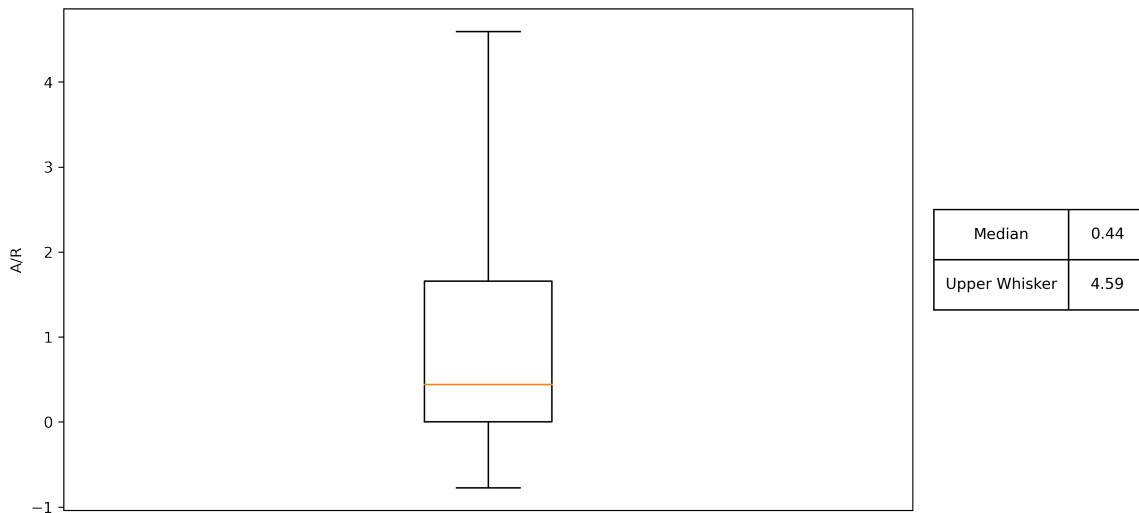
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	8	360.7	0.73	0.82	0.0	1.66	4.59	0
A-R	8	360.7	-40.73	91.88	-183.5	49.6	170.71	0

Figure 30-1. Histogram of A/R for OAT - GRAIN fields in the Coalition.



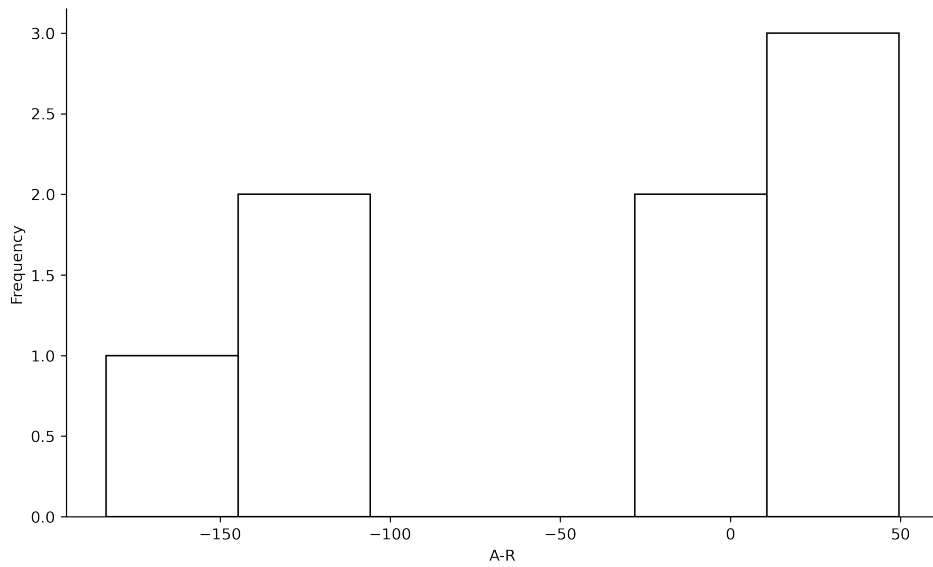
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 30-2. Box and whisker plot of A/R for OAT - GRAIN fields in the Coalition.



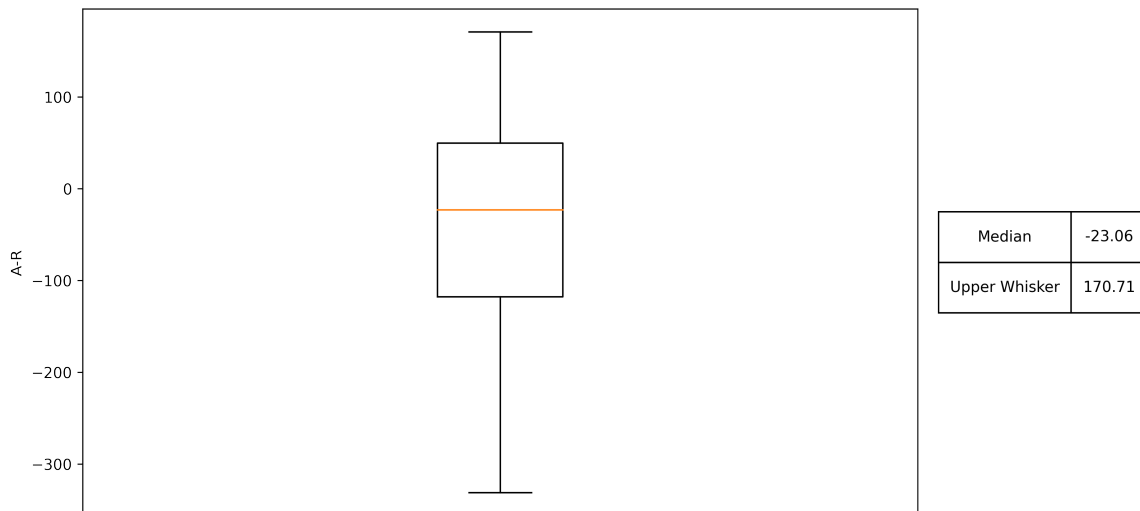
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 30-3. Histogram of A-R for OAT - GRAIN fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 30-4. Box and whisker plot of A-R for OAT - GRAIN fields in the Coalition.



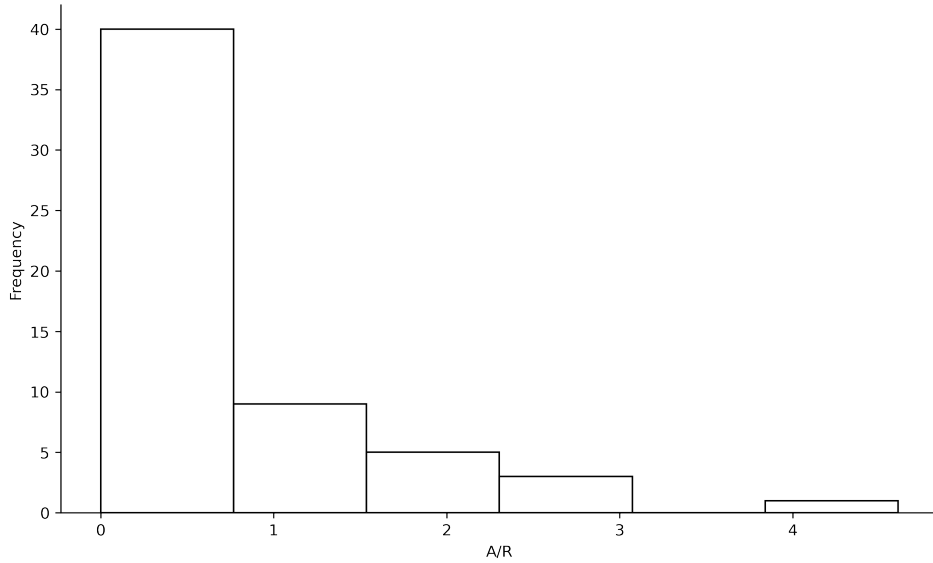
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

31. OAT - HAY

Table 31-1. Summary statistics for OAT - HAY fields in Coalition.

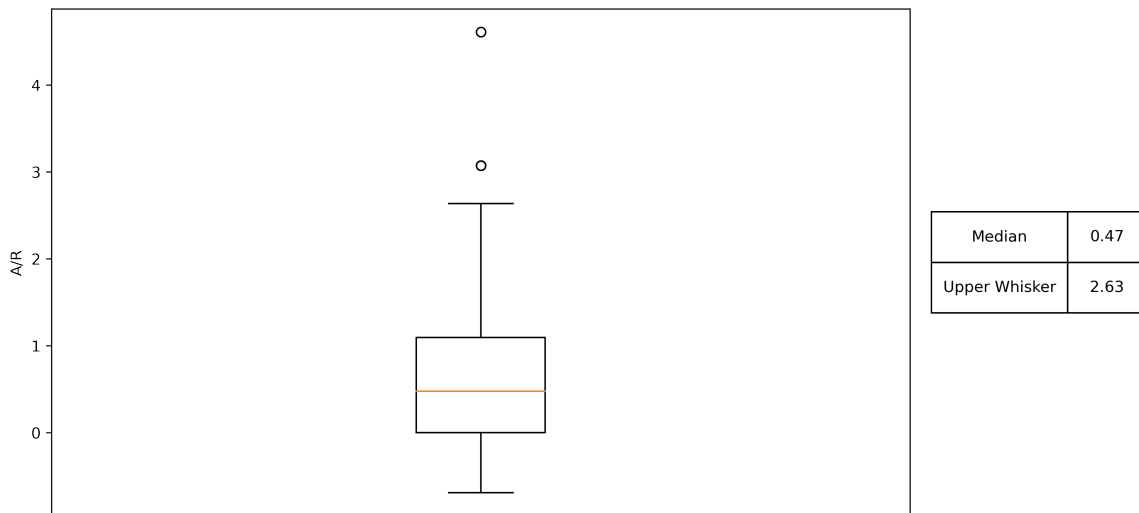
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	58	2285.2	0.69	0.96	0.0	4.61	2.63	3
A-R	58	2285.2	-23.74	94.05	-542.5	234.9	90.1	3

Figure 31-1. Histogram of A/R for OAT - HAY fields in the Coalition.



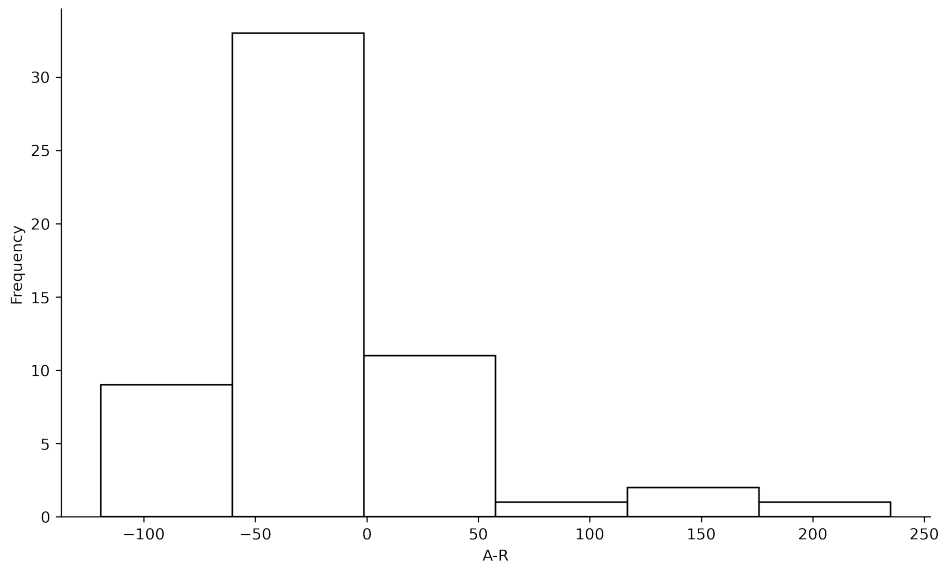
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 31-2. Box and whisker plot of A/R for OAT - HAY fields in the Coalition.



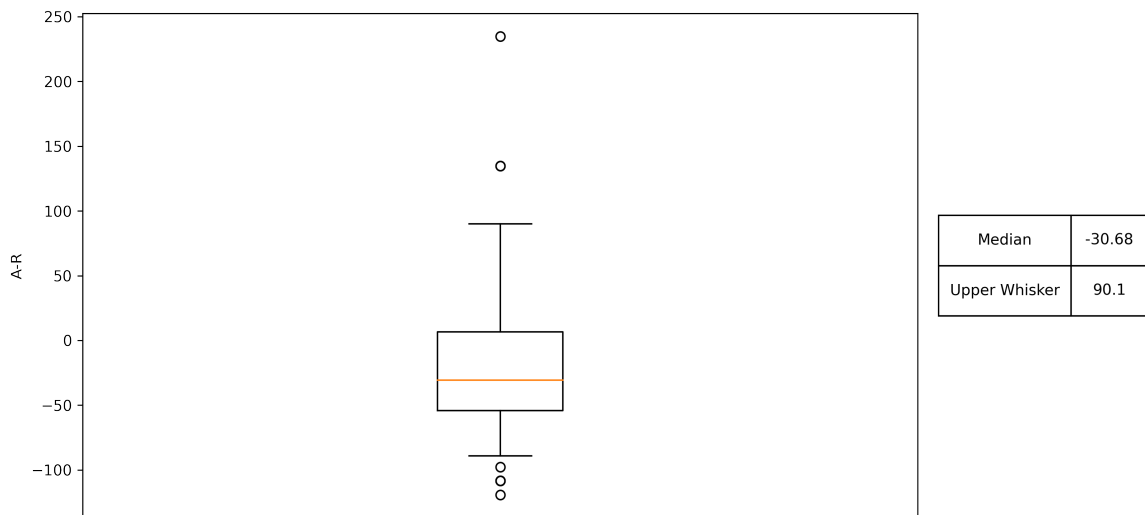
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 31-3. Histogram of A-R for OAT - HAY fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 31-4. Box and whisker plot of A-R for OAT - HAY fields in the Coalition.



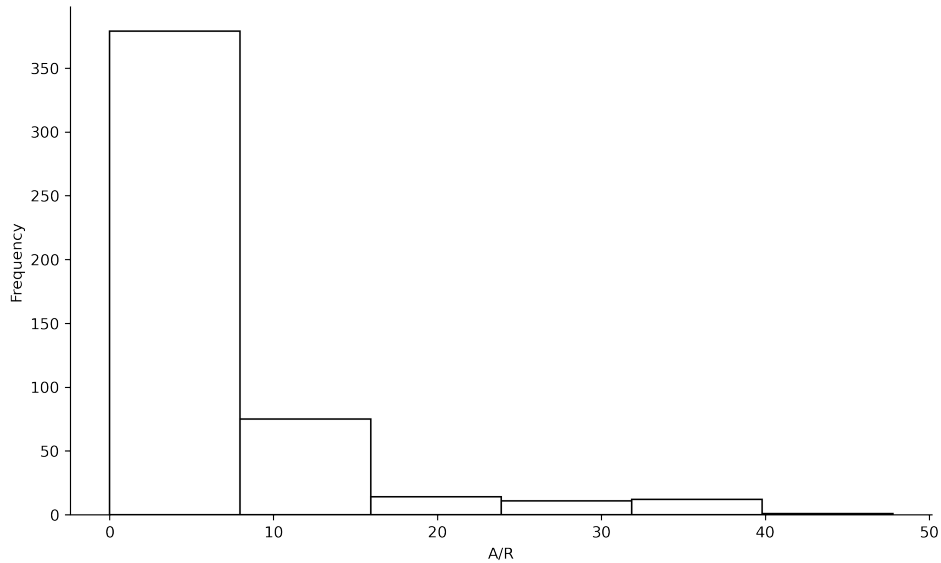
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

32. OLIVE

Table 32-1. Summary statistics for OLIVE fields in Coalition.

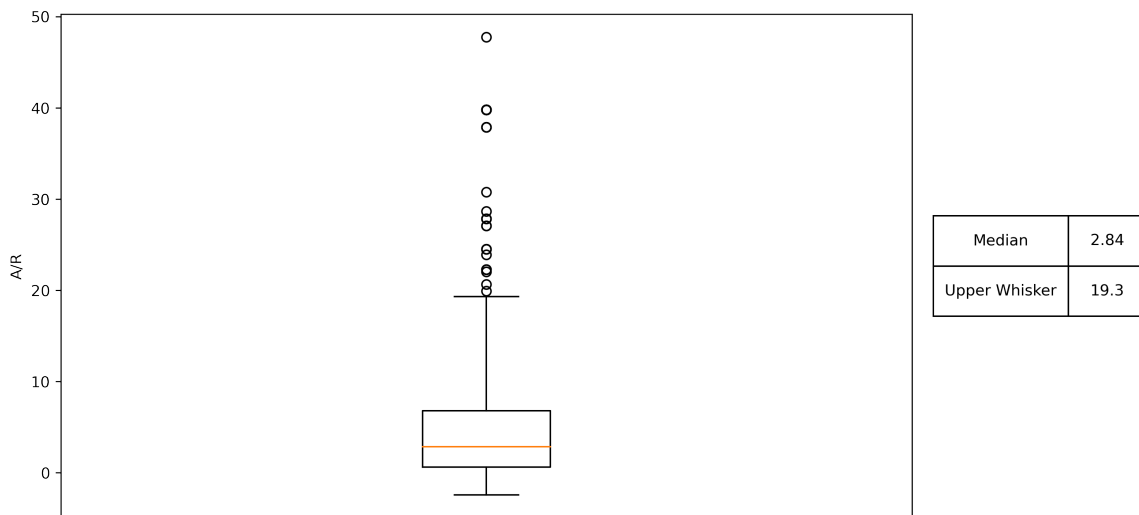
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	502	17241.18	7.85	22.6	0.0	308.2	19.3	38
A-R	502	17241.18	51.15	67.32	-144.44	299.03	158.28	38

Figure 32-1. Histogram of A/R for OLIVE fields in the Coalition.



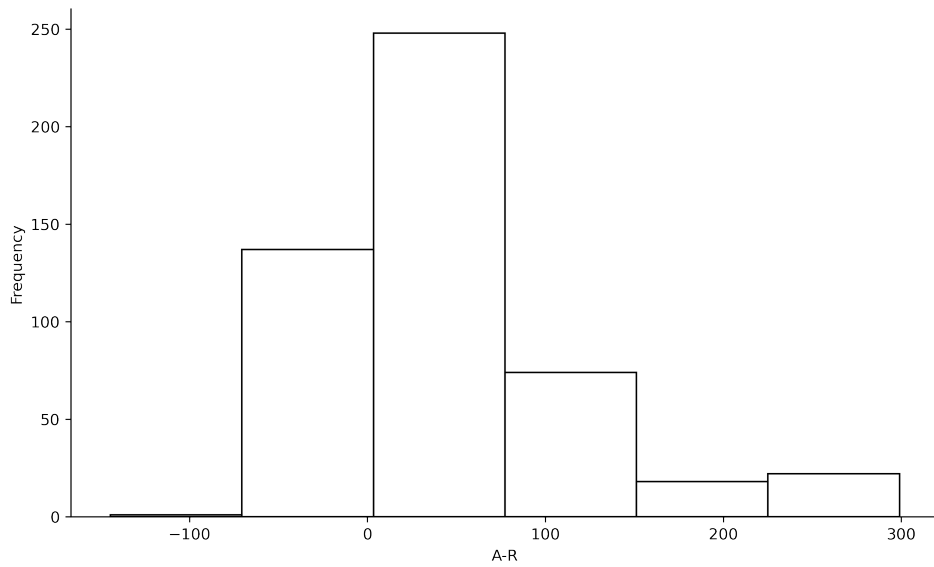
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 32-2. Box and whisker plot of A/R for OLIVE fields in the Coalition.



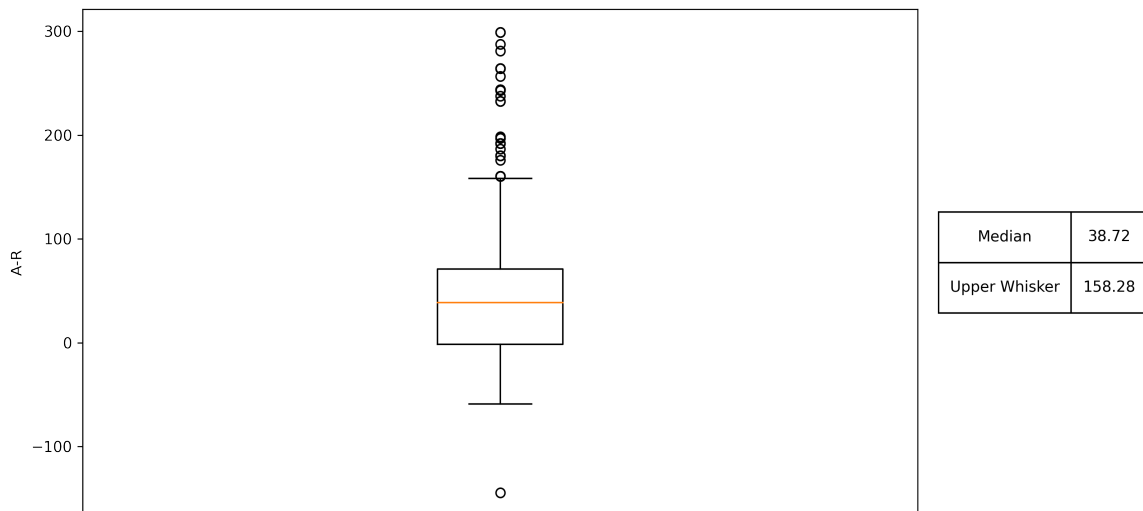
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 32-3. Histogram of A-R for OLIVE fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 32-4. Box and whisker plot of A-R for OLIVE fields in the Coalition.



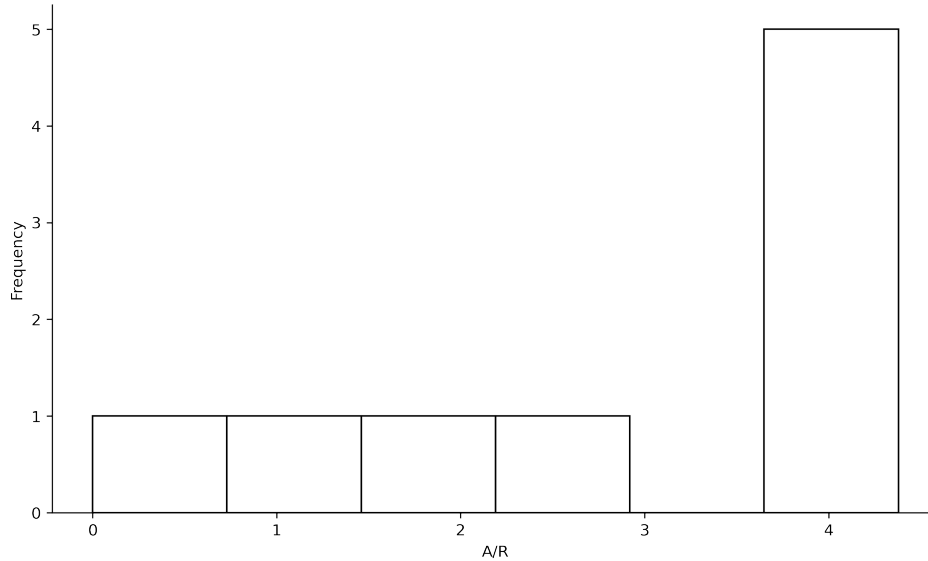
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

33. OLIVE-YOUNG

Table 33-1. Summary statistics for OLIVE-YOUNG fields in Coalition.

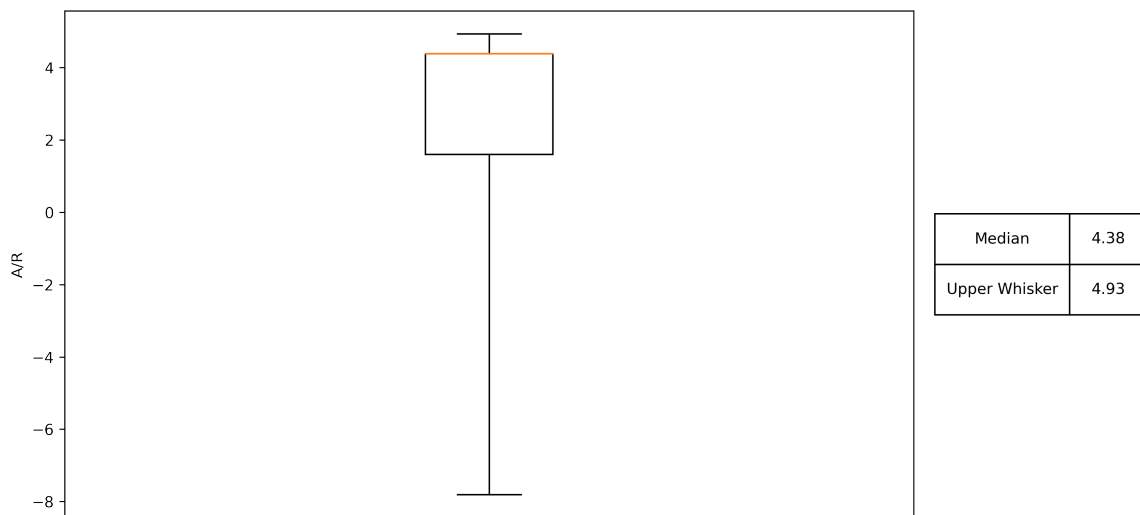
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	9	905.9	2.99	1.75	0.0	4.38	4.93	--
A-R	9	905.9	29.82	19.82	-4.14	43.6	47.88	--

Figure 33-1. Histogram of A/R for OLIVE-YOUNG fields in the Coalition.



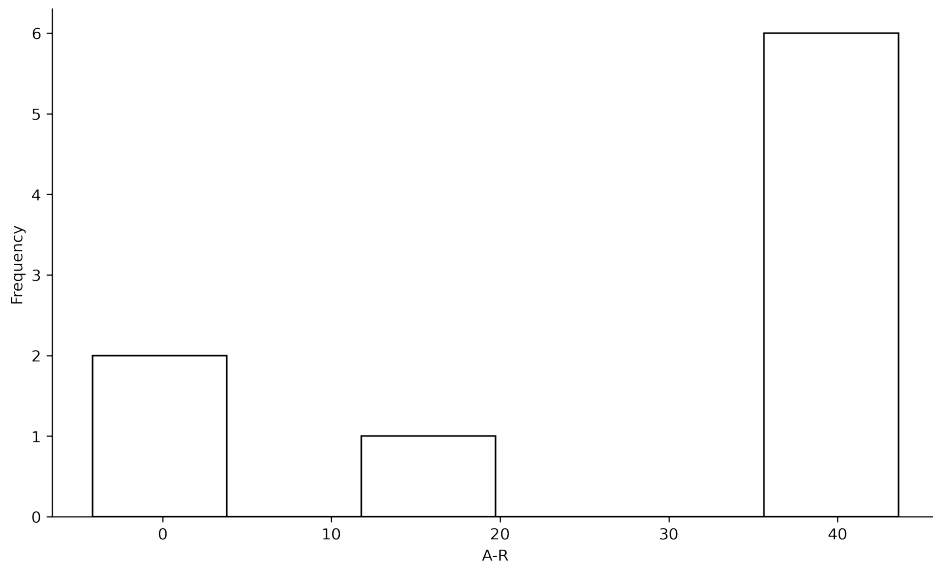
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 33-2. Box and whisker plot of A/R for OLIVE-YOUNG fields in the Coalition.



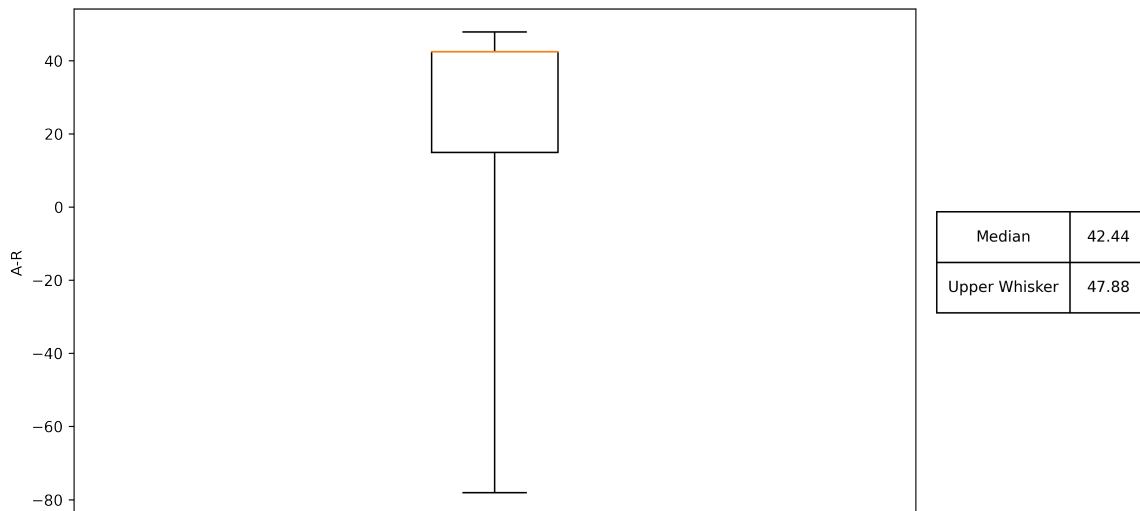
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 33-3. Histogram of A-R for OLIVE-YOUNG fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 33-4. Box and whisker plot of A-R for OLIVE-YOUNG fields in the Coalition.



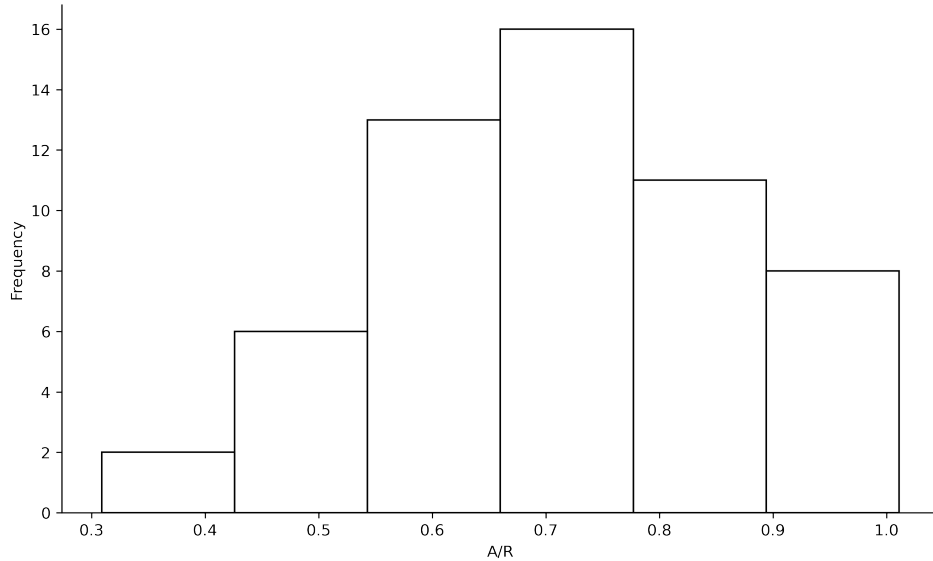
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

34. ORCHARD GRASS - HAY

Table 34-1. Summary statistics for ORCHARD GRASS - HAY fields in Coalition.

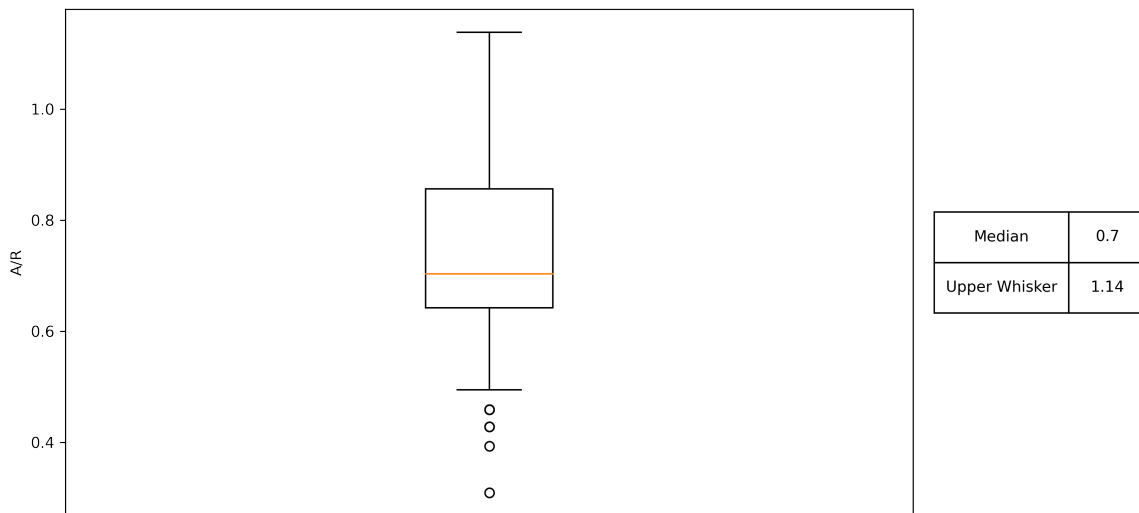
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	56	3442.1	0.71	0.16	0.31	1.01	1.14	0
A-R	56	3442.1	-84.46	45.2	-181.5	2.95	23.0	0

Figure 34-1. Histogram of A/R for ORCHARD GRASS - HAY fields in the Coalition.



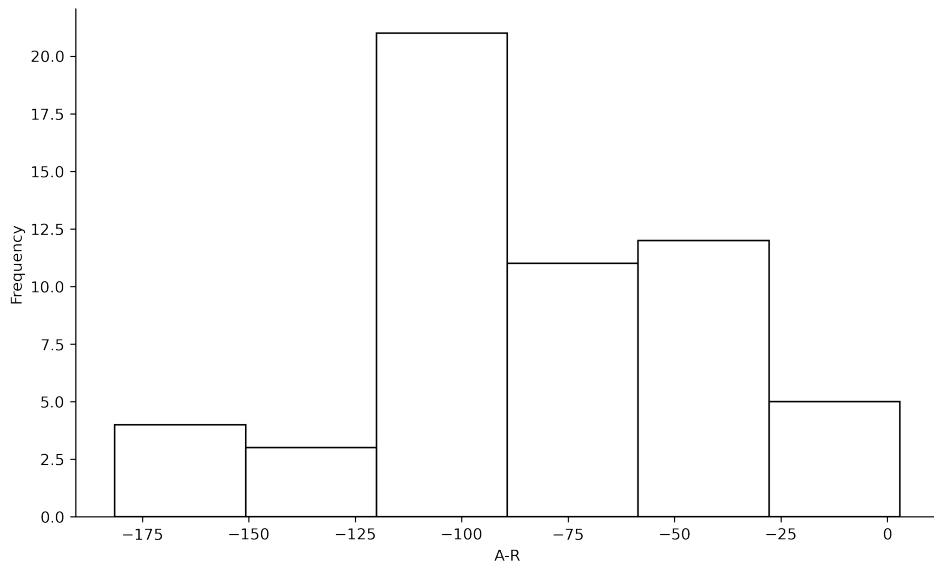
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 34-2. Box and whisker plot of A/R for ORCHARD GRASS - HAY fields in the Coalition.



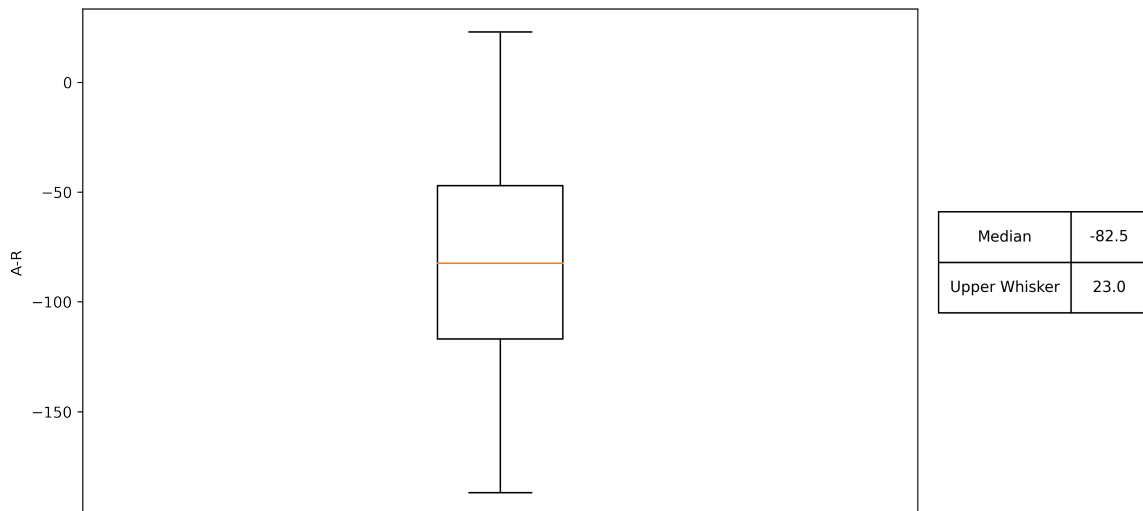
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 34-3. Histogram of A-R for ORCHARD GRASS - HAY fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 34-4. Box and whisker plot of A-R for ORCHARD GRASS - HAY fields in the Coalition.



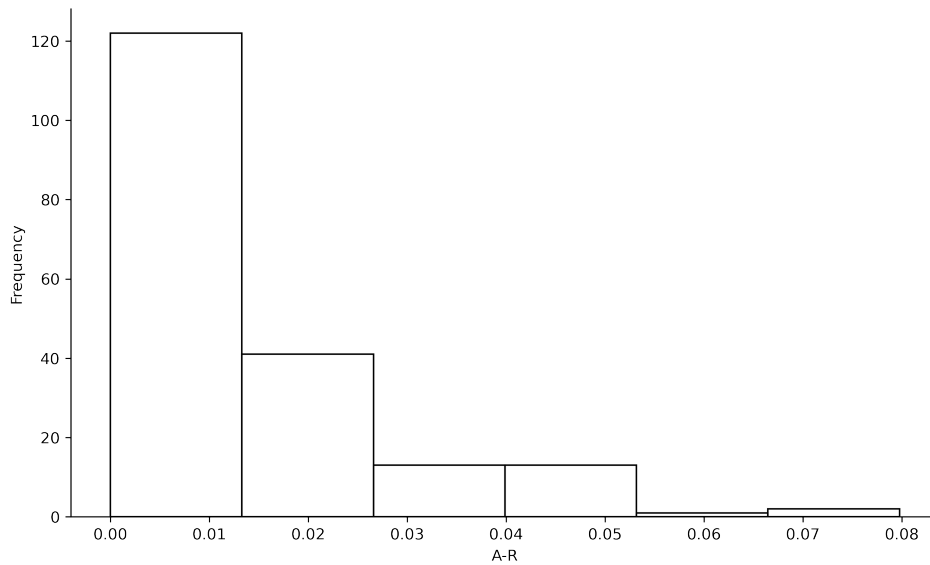
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

35. PASTURE

Table 35-1. Summary statistics for PASTURE fields in Coalition.

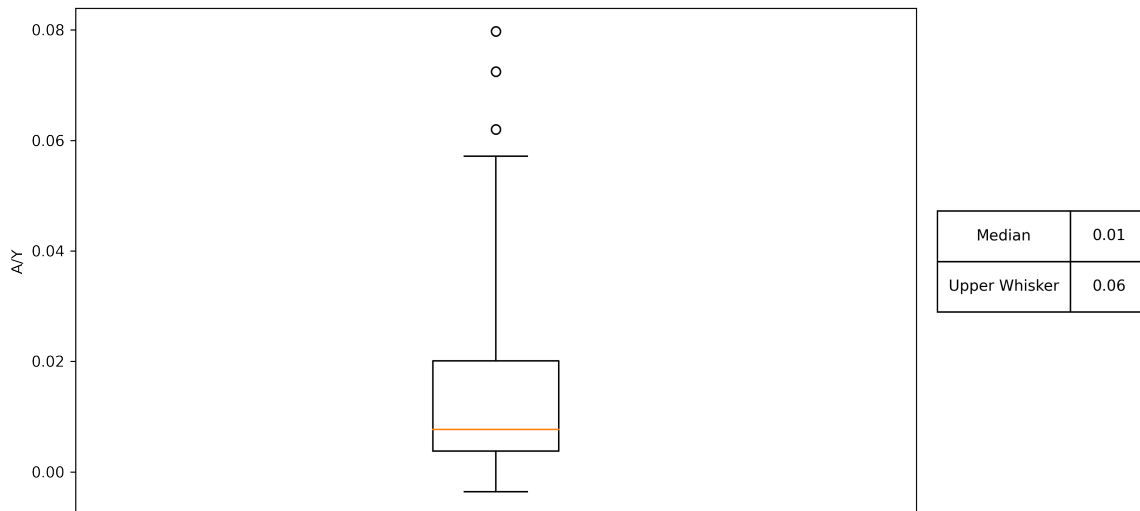
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/Y	196	16218.07	0.08	0.58	0.0	7.5	0.06	7

Figure 35-1. Histogram of A/Y for PASTURE fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot

Figure 35-2. Box and whisker plot of A/Y for PASTURE fields in the Coalition.



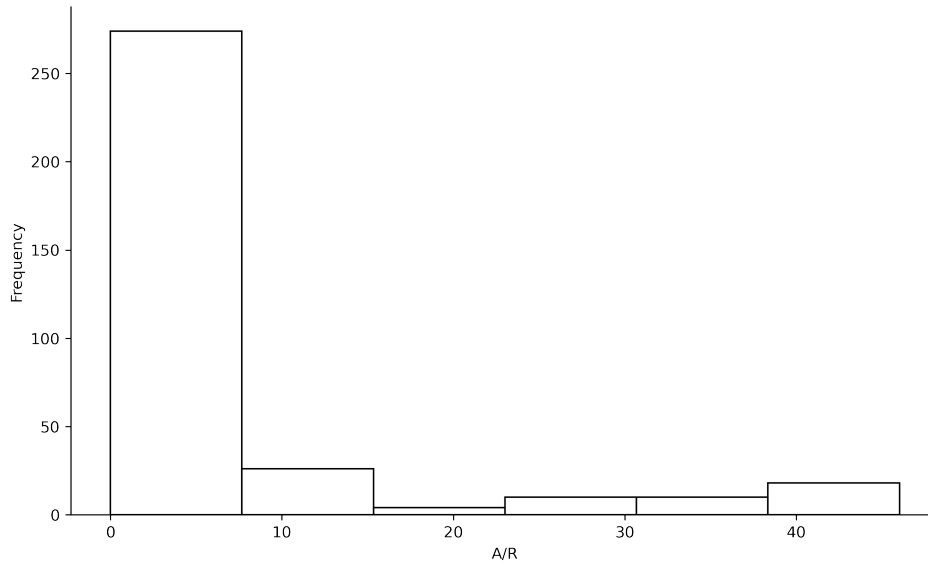
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot
The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

36. PEACH/NECTARINE

Table 36-1. Summary statistics for PEACH/NECTARINE fields in Coalition.

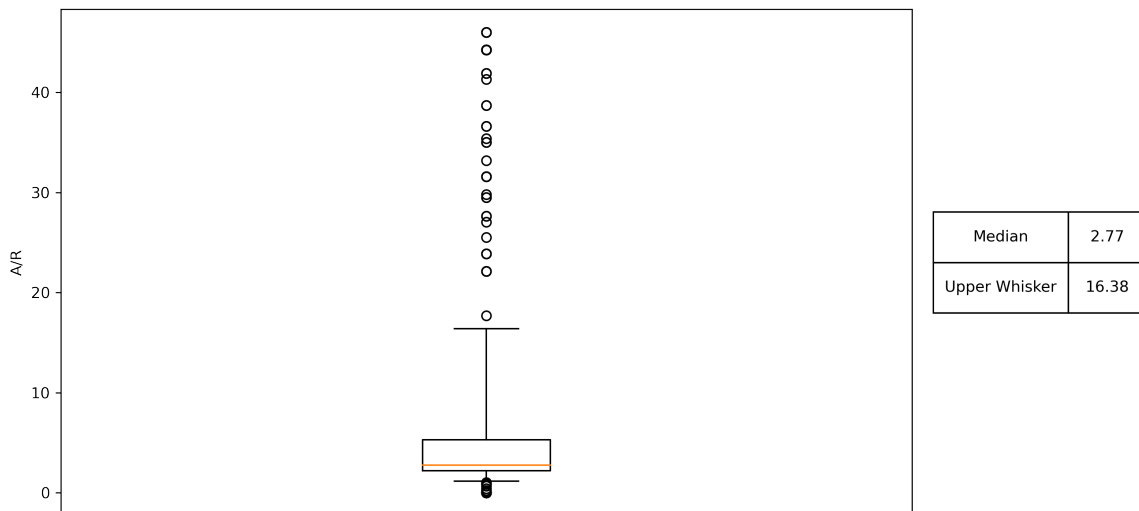
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	356	8106.58	9.56	15.61	0.0	66.37	16.38	56
A-R	356	8106.58	83.31	67.92	-36.68	329.8	167.3	22

Figure 36-1. Histogram of A/R for PEACH/NECTARINE fields in the Coalition.



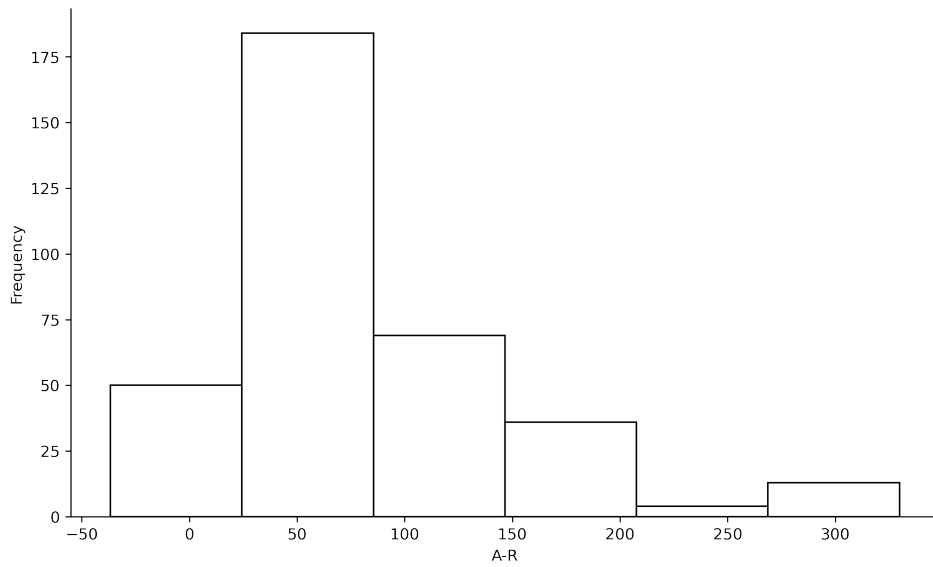
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 36-2. Box and whisker plot of A/R for PEACH/NECTARINE fields in the Coalition.



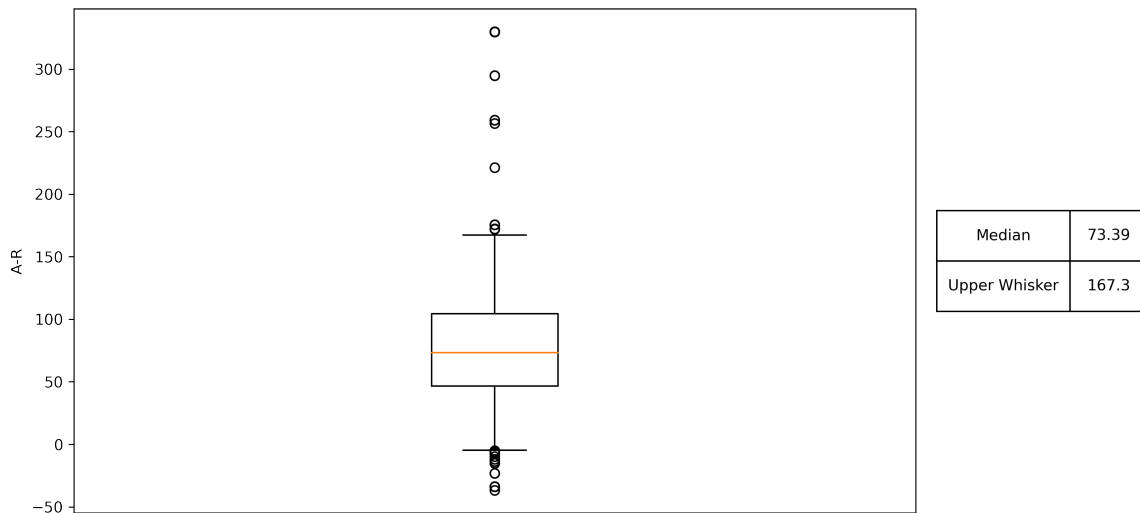
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 36-3. Histogram of A-R for PEACH/NECTARINE fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 36-4. Box and whisker plot of A-R for PEACH/NECTARINE fields in the Coalition.



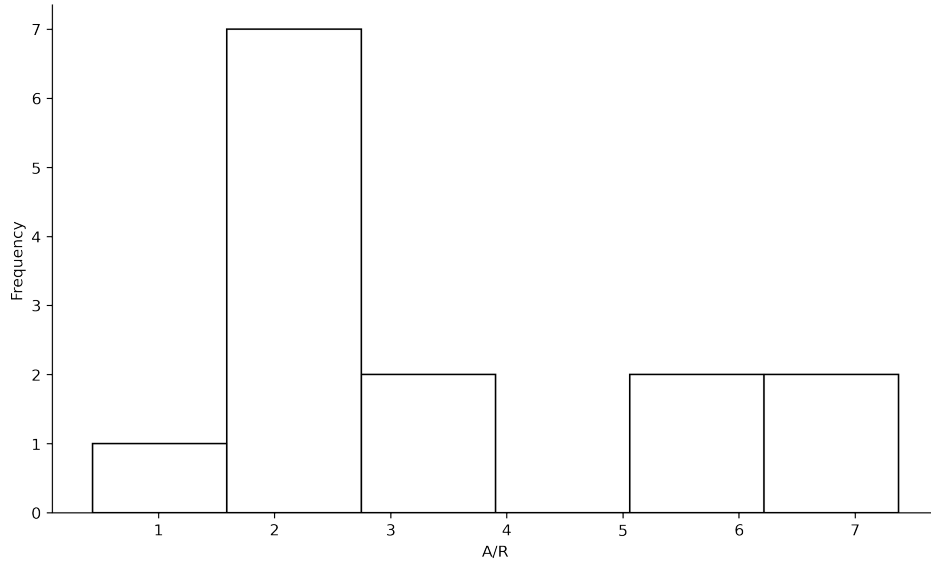
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

37. PEACH/NECTARINE-YOUNG

Table 37-1. Summary statistics for PEACH/NECTARINE-YOUNG fields in Coalition.

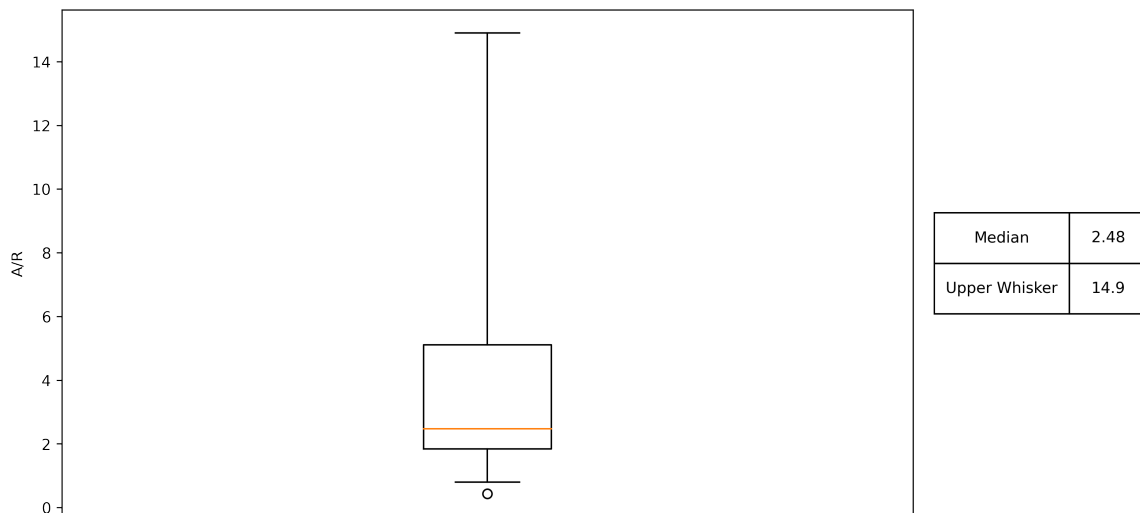
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	15	254.51	9.19	22.53	0.43	90.27	14.9	--
A-R	15	254.51	52.64	65.24	-22.07	259.32	104.23	--

Figure 37-1. Histogram of A/R for PEACH/NECTARINE-YOUNG fields in the Coalition.



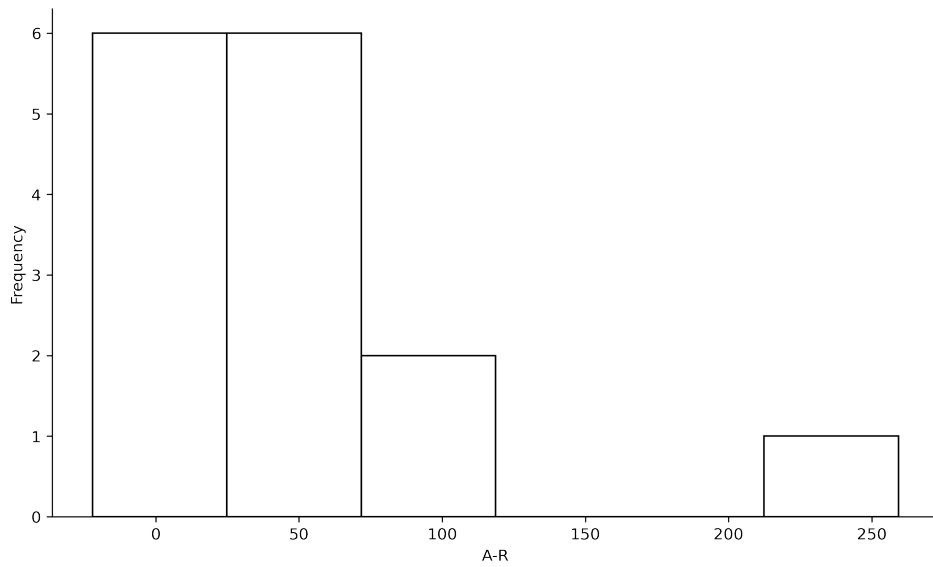
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 37-2. Box and whisker plot of A/R for PEACH/NECTARINE-YOUNG fields in the Coalition.



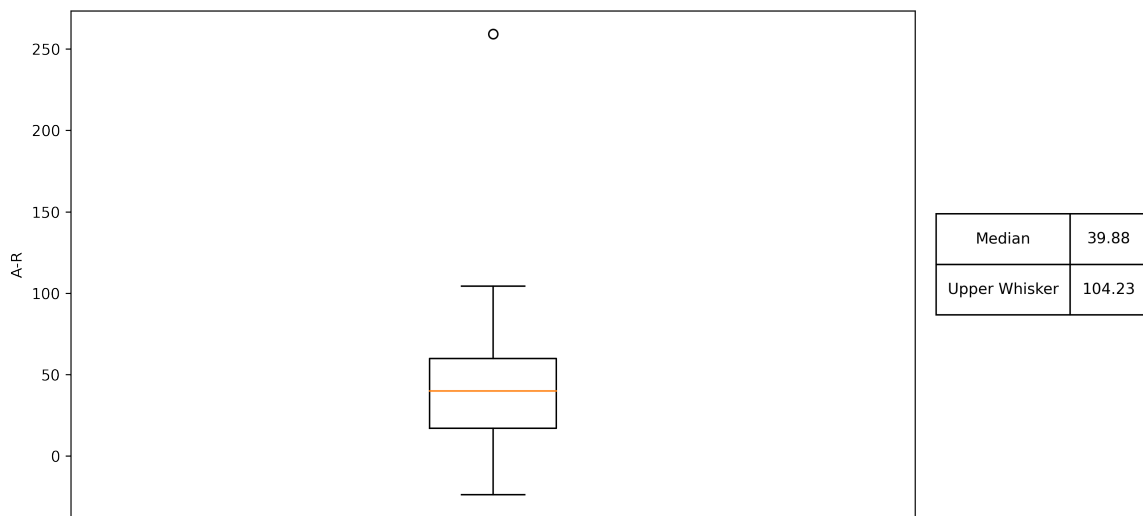
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 37-3. Histogram of A-R for PEACH/NECTARINE-YOUNG fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 37-4. Box and whisker plot of A-R for PEACH/NECTARINE-YOUNG fields in the Coalition.



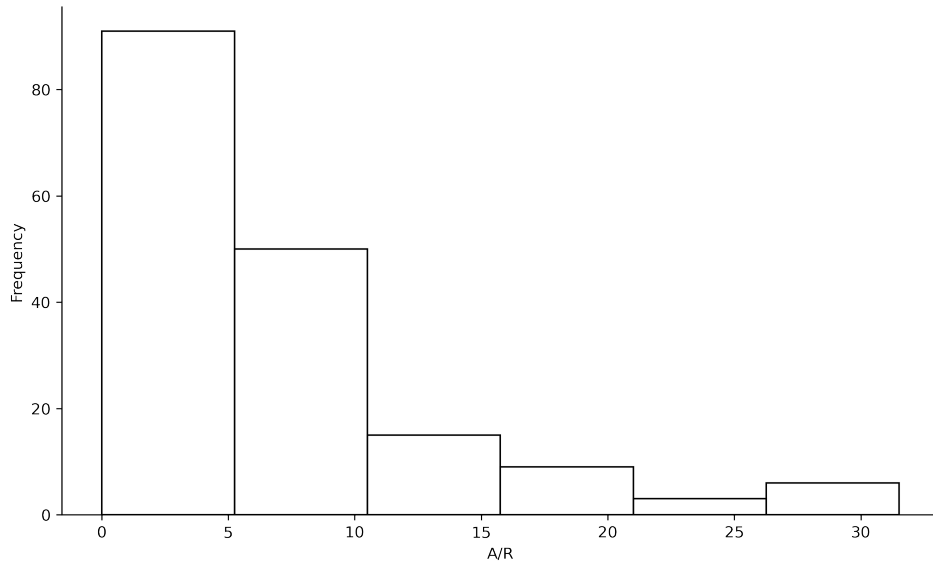
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

38. PEAR

Table 38-1. Summary statistics for PEAR fields in Coalition.

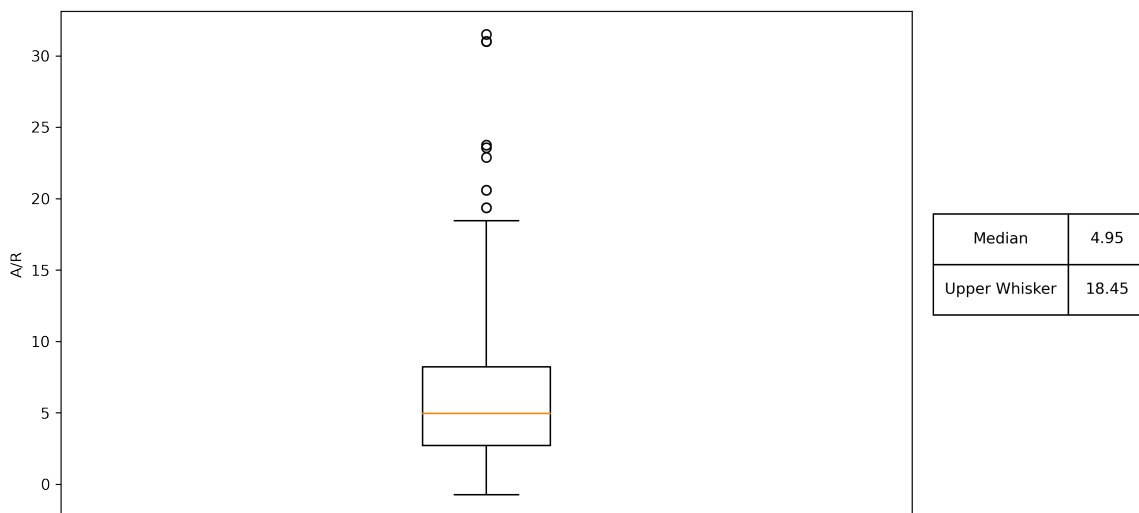
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	180	5996.76	12.32	29.48	0.0	217.05	18.45	19
A-R	180	5996.76	87.34	73.05	-13.54	381.9	231.1	6

Figure 38-1. Histogram of A/R for PEAR fields in the Coalition.



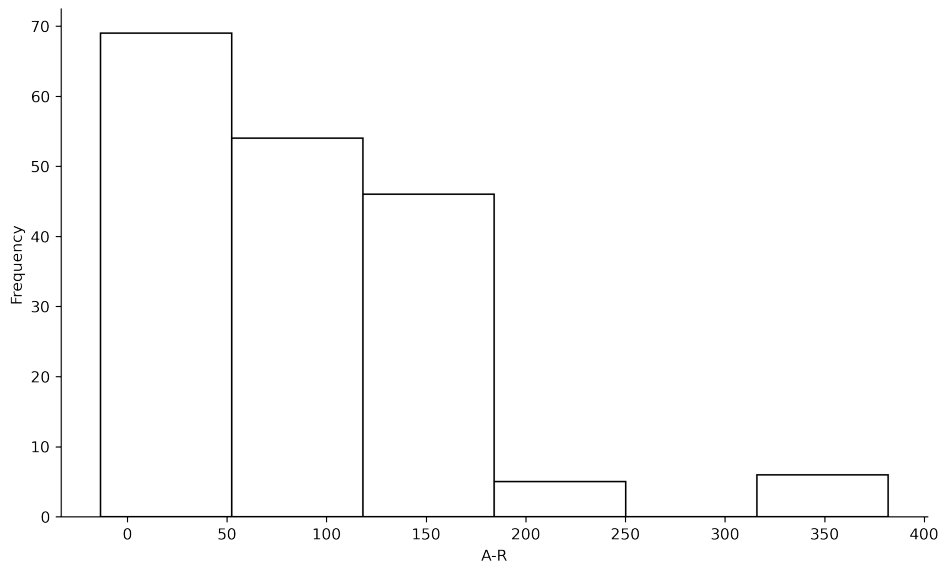
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 38-2. Box and whisker plot of A/R for PEAR fields in the Coalition.



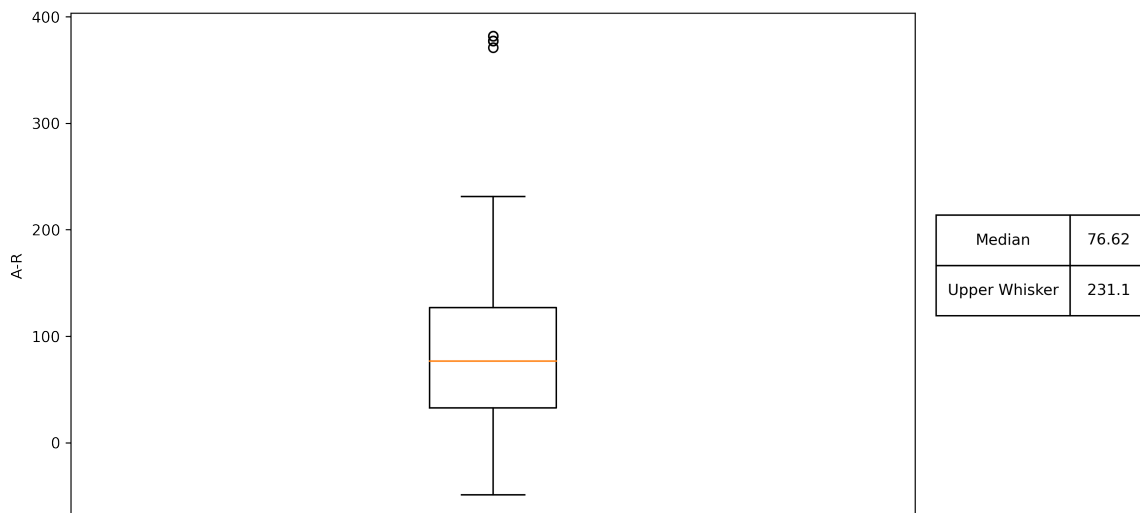
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 38-3. Histogram of A-R for PEAR fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 38-4. Box and whisker plot of A-R for PEAR fields in the Coalition.



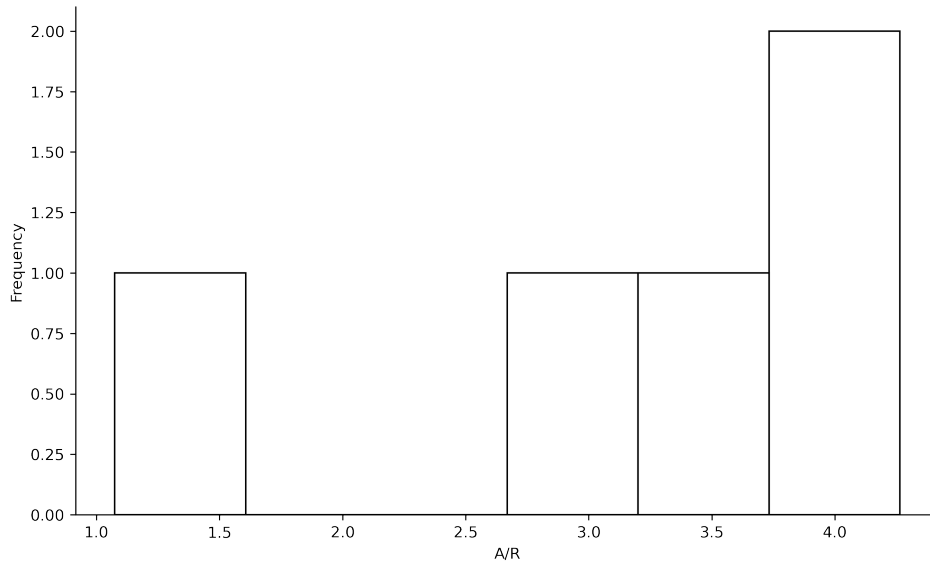
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

39. PEAR-YOUNG

Table 39-1. Summary statistics for PEAR-YOUNG fields in Coalition.

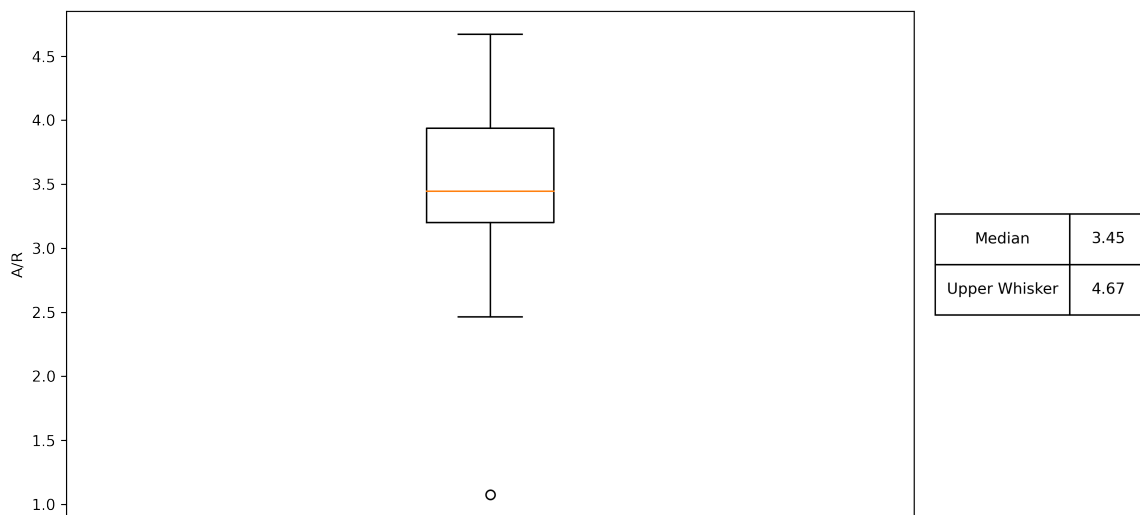
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	5	205.0	3.18	1.25	1.07	4.26	4.67	--
A-R	5	205.0	37.08	22.82	1.39	56.78	57.6	--

Figure 39-1. Histogram of A/R for PEAR-YOUNG fields in the Coalition.



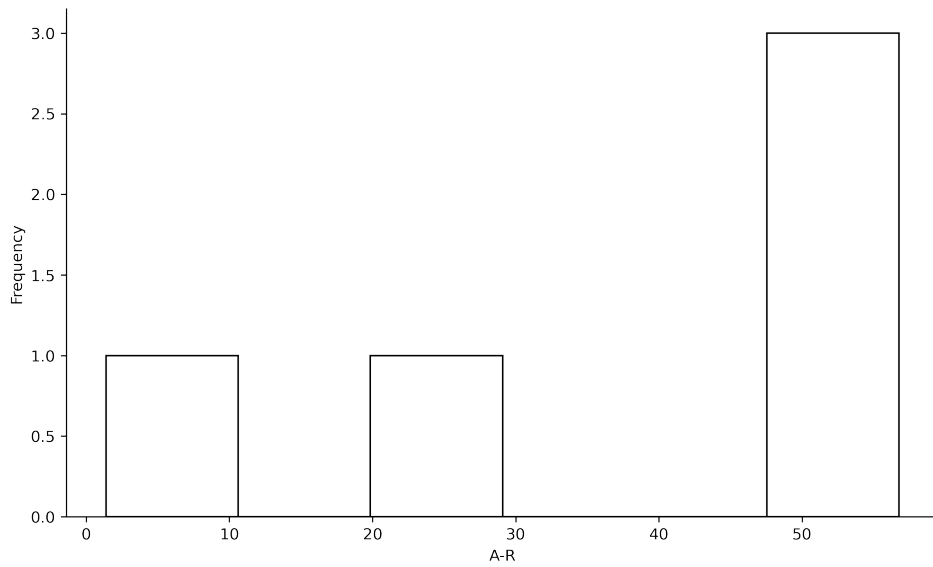
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 39-2. Box and whisker plot of A/R for PEAR-YOUNG fields in the Coalition.



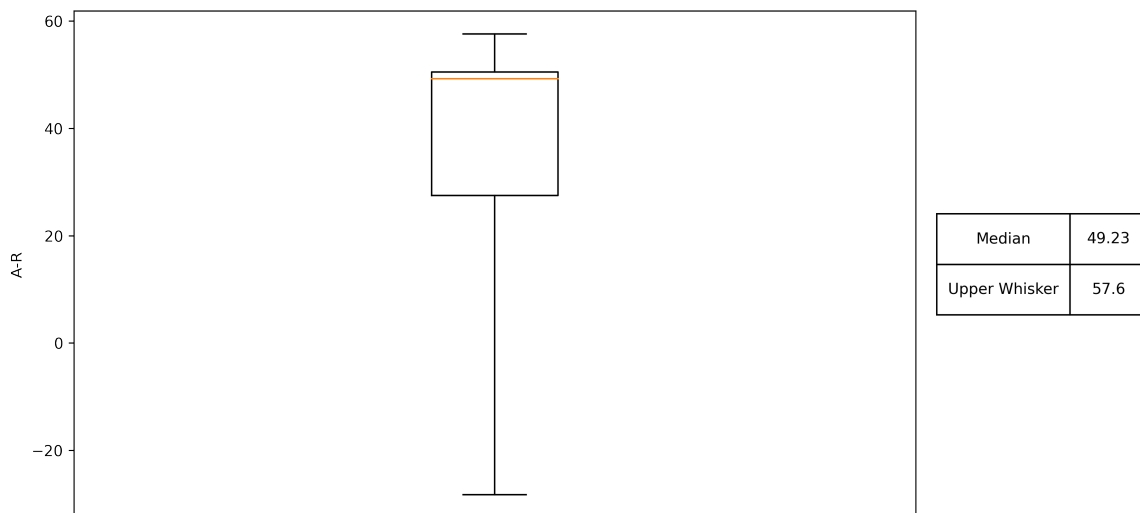
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 39-3. Histogram of A-R for PEAR-YOUNG fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 39-4. Box and whisker plot of A-R for PEAR-YOUNG fields in the Coalition.



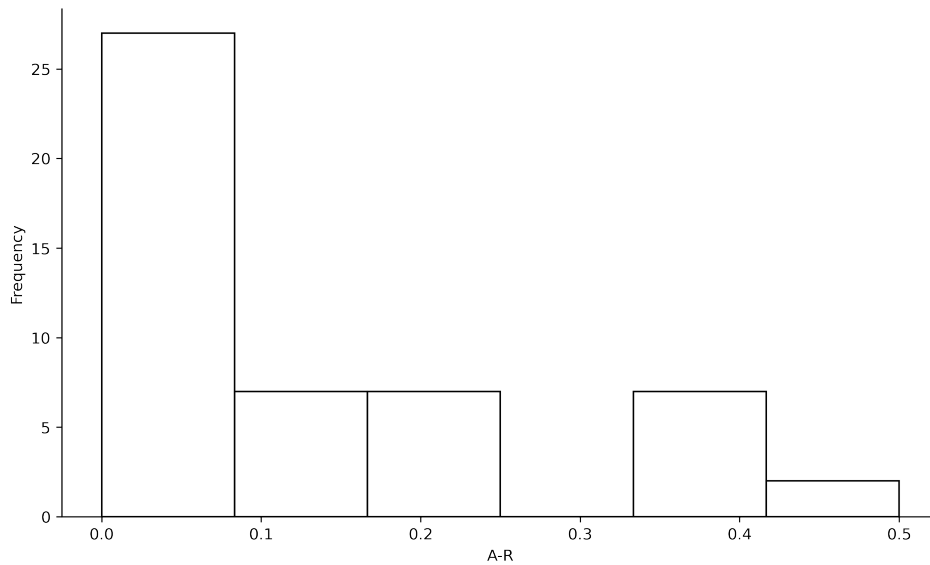
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

40. PECAN

Table 40-1. Summary statistics for PECAN fields in Coalition.

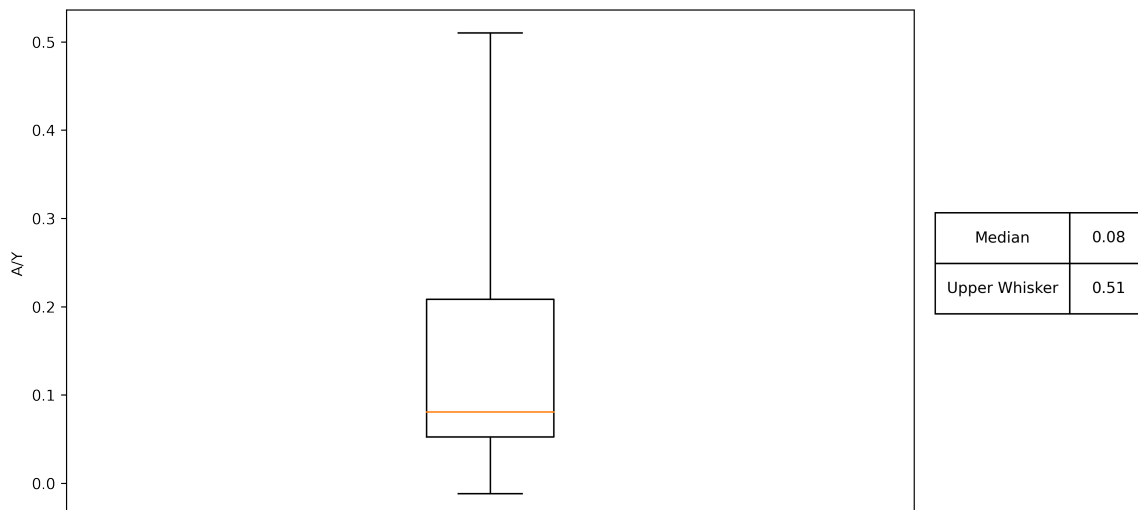
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/Y	50	1418.53	0.14	0.13	0.0	0.5	0.51	0

Figure 40-1. Histogram of A/Y for PECAN fields in the Coalition.



Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot

Figure 40-2. Box and whisker plot of A/Y for PECAN fields in the Coalition.



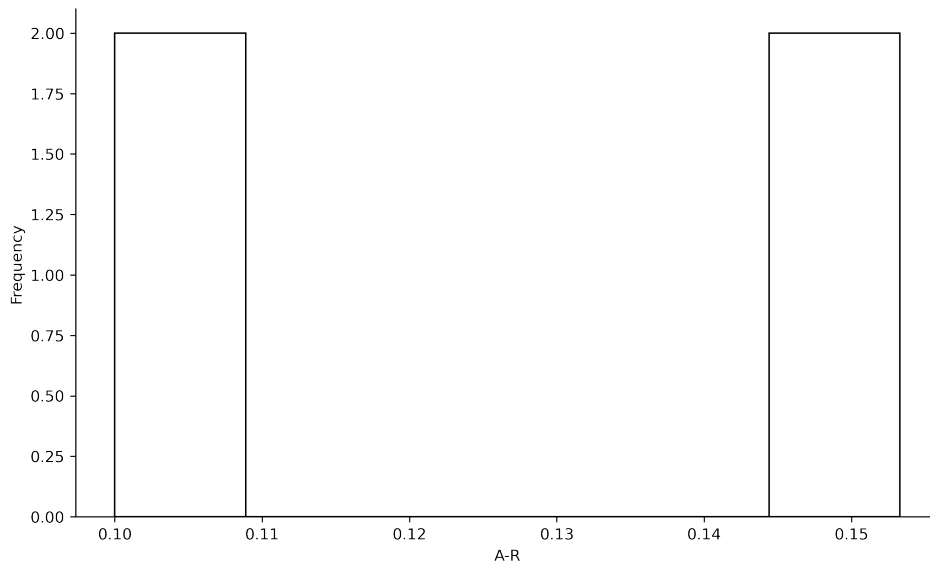
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot
The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

41. PECAN-YOUNG

Table 41-1. Summary statistics for PECAN-YOUNG fields in Coalition.

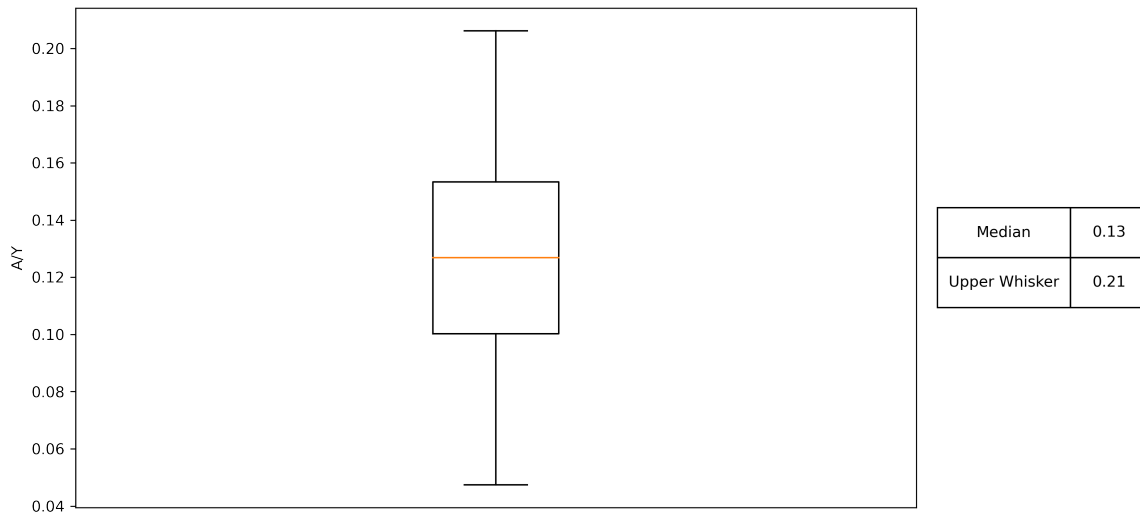
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/Y	5	135.5	0.7	1.29	0.1	3.01	0.21	--

Figure 41-1. Histogram of A/Y for PECAN-YOUNG fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot

Figure 41-2. Box and whisker plot of A/Y for PECAN-YOUNG fields in the Coalition.



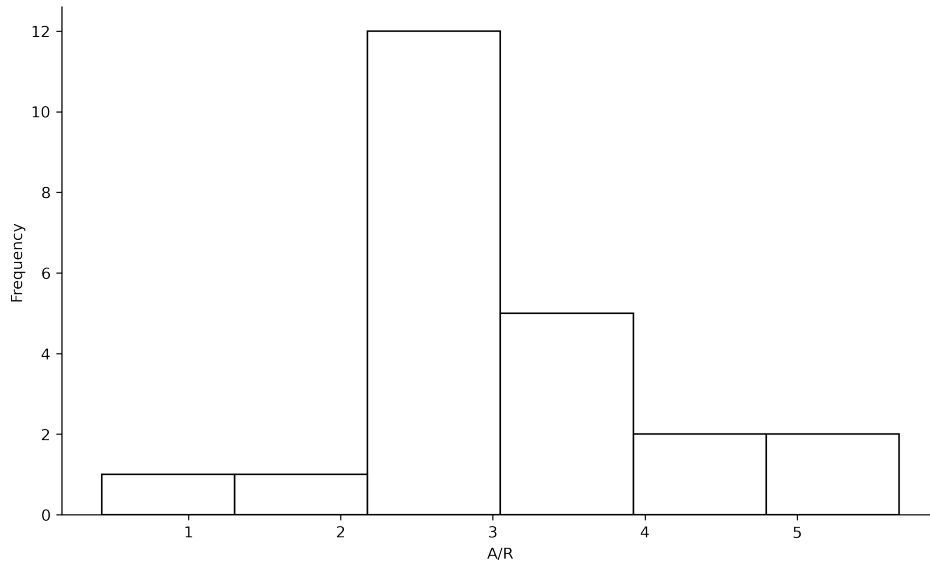
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot
The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

42. PEPPER

Table 42-1. Summary statistics for PEPPER fields in Coalition.

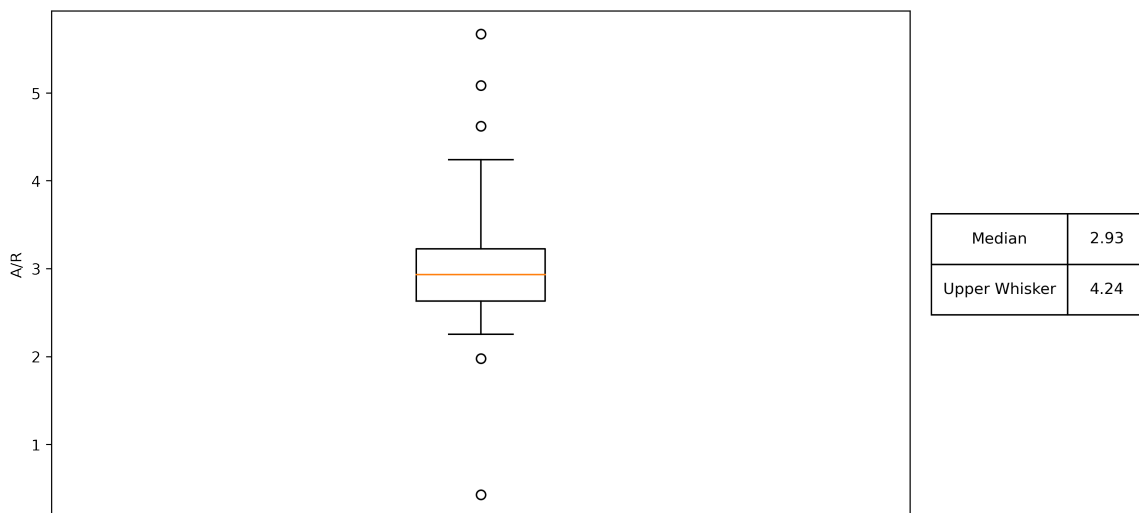
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	24	1037.55	3.6	2.75	0.43	15.63	4.24	4
A-R	24	1037.55	144.52	53.53	-5.68	280.8	188.49	5

Figure 42-1. Histogram of A/R for PEPPER fields in the Coalition.



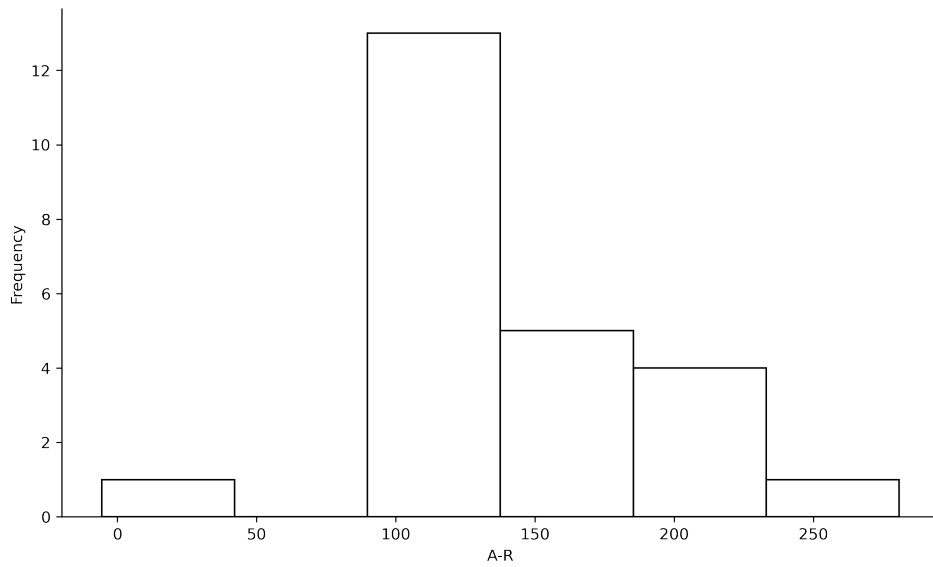
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 42-2. Box and whisker plot of A/R for PEPPER fields in the Coalition.



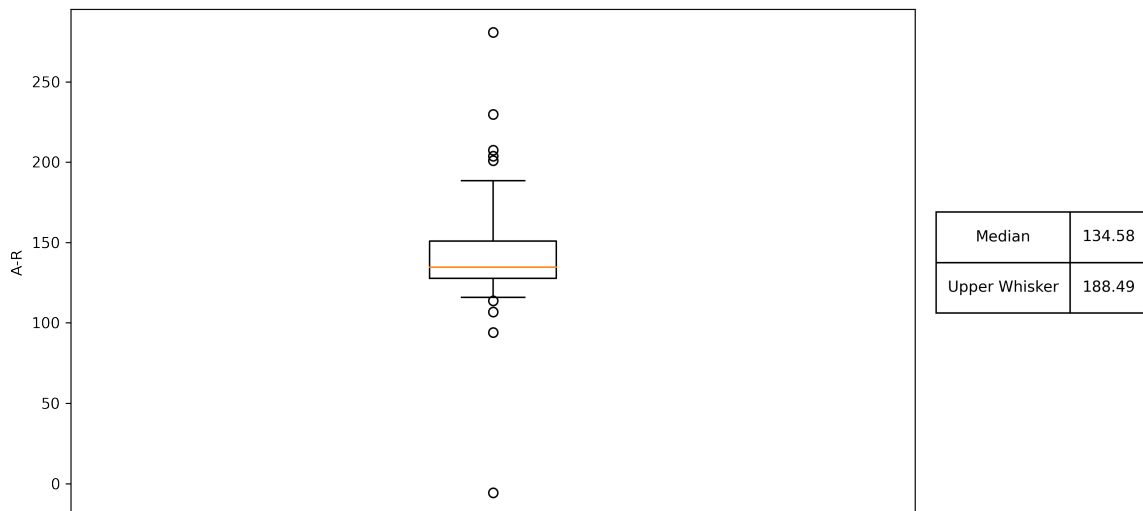
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 42-3. Histogram of A-R for PEPPER fields in the Coalition.



Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 42-4. Box and whisker plot of A-R for PEPPER fields in the Coalition.



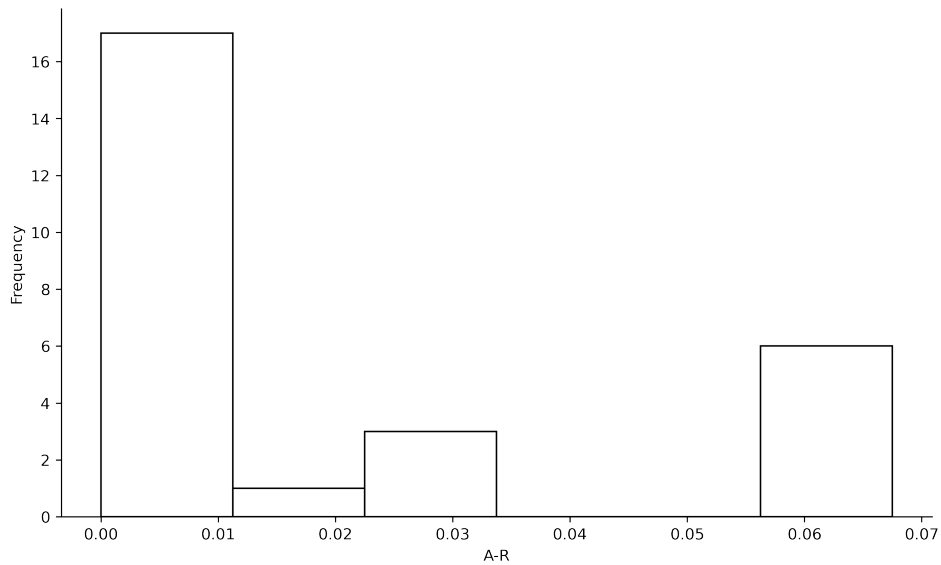
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

43. PERSIMMON

Table 43-1. Summary statistics for PERSIMMON fields in Coalition.

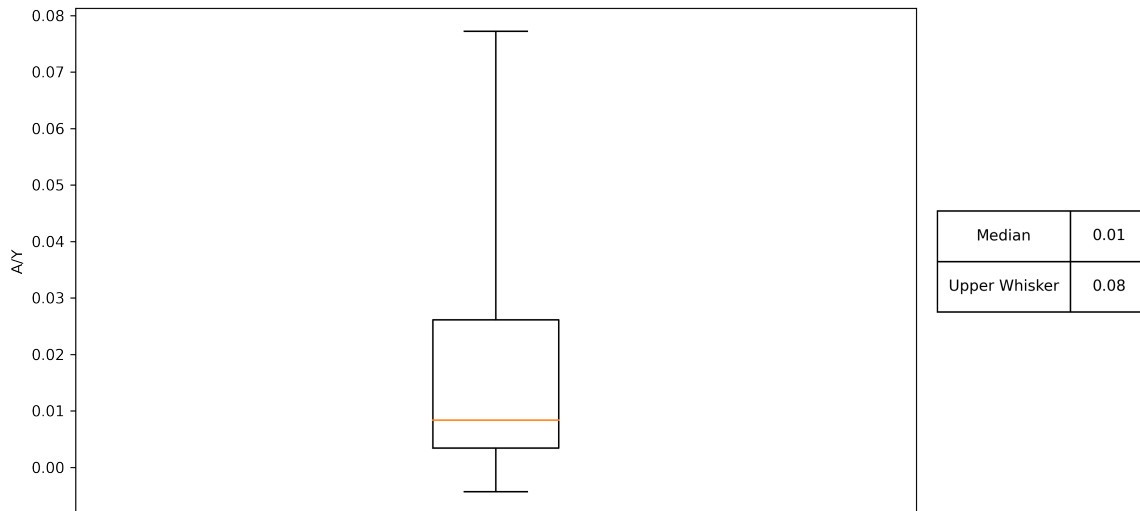
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/Y	27	308.12	0.02	0.03	0.0	0.07	0.08	0

Figure 43-1. Histogram of A/Y for PERSIMMON fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot

Figure 43-2. Box and whisker plot of A/Y for PERSIMMON fields in the Coalition.



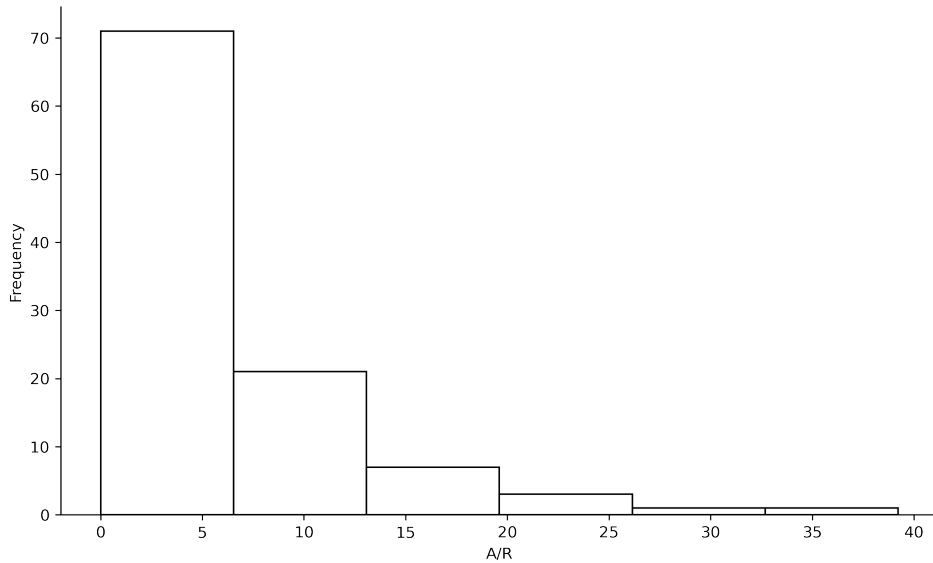
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot
The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

44. PISTACHIO

Table 44-1. Summary statistics for PISTACHIO fields in Coalition.

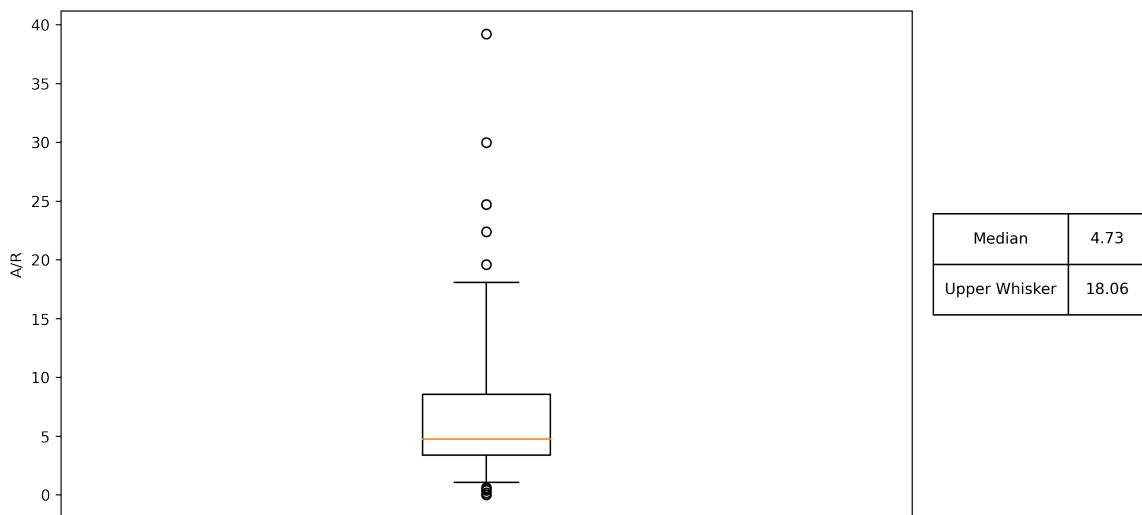
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	104	5581.11	6.94	6.4	0.0	39.22	18.06	6
A-R	104	5581.11	107.78	74.33	-57.12	364.48	232.67	8

Figure 44-1. Histogram of A/R for PISTACHIO fields in the Coalition.



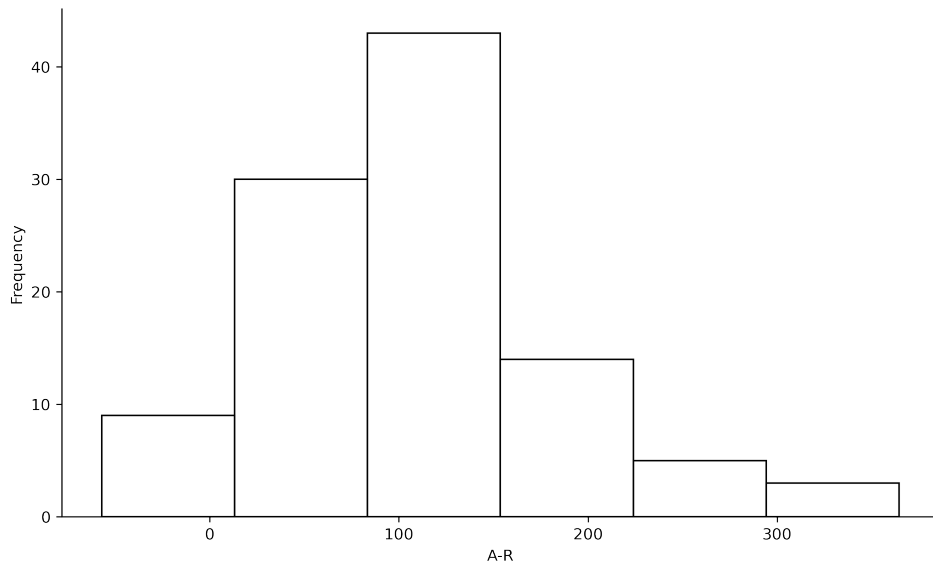
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 44-2. Box and whisker plot of A/R for PISTACHIO fields in the Coalition.



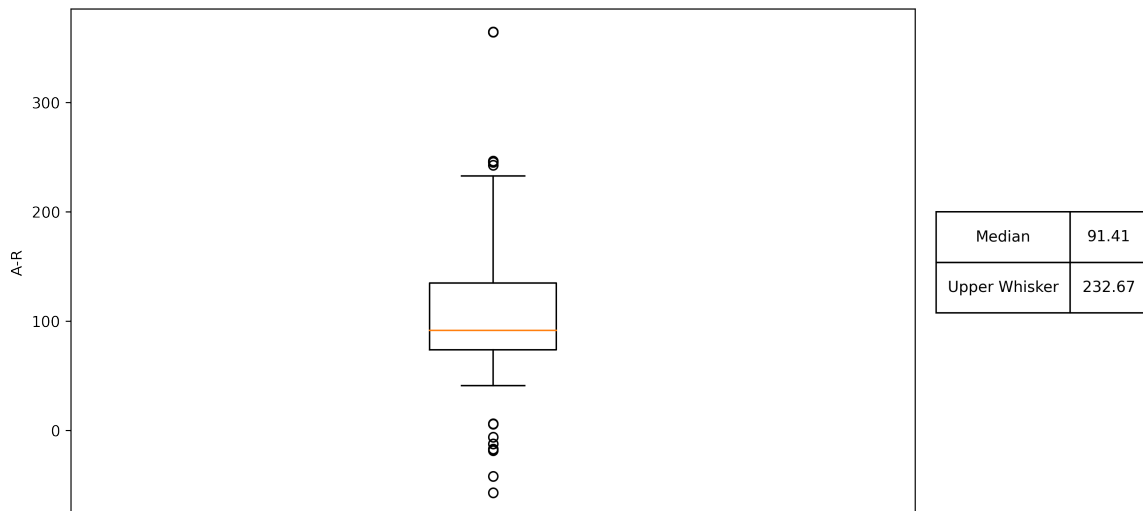
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 44-3. Histogram of A-R for PISTACHIO fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 44-4. Box and whisker plot of A-R for PISTACHIO fields in the Coalition.



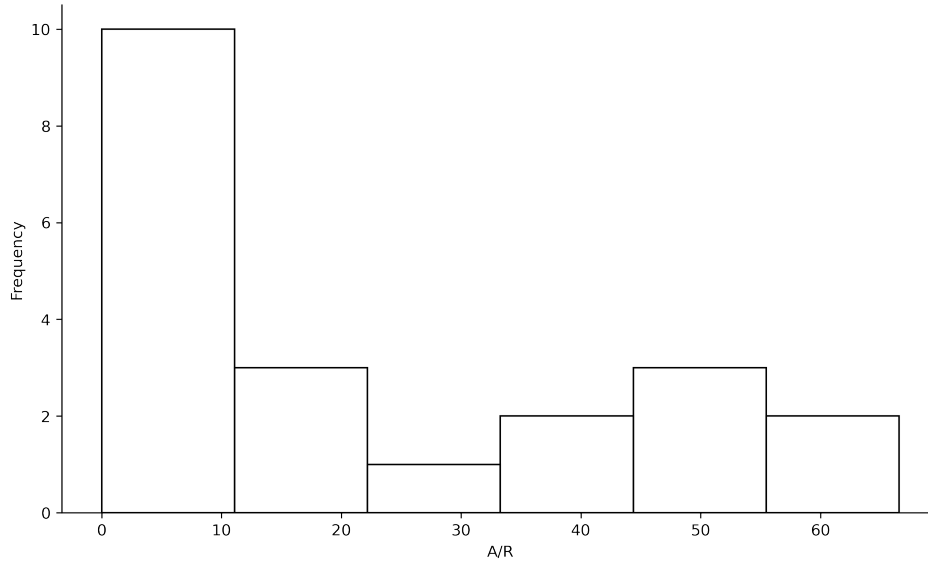
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

45. PISTACHIO-YOUNG

Table 45-1. Summary statistics for PISTACHIO-YOUNG fields in Coalition.

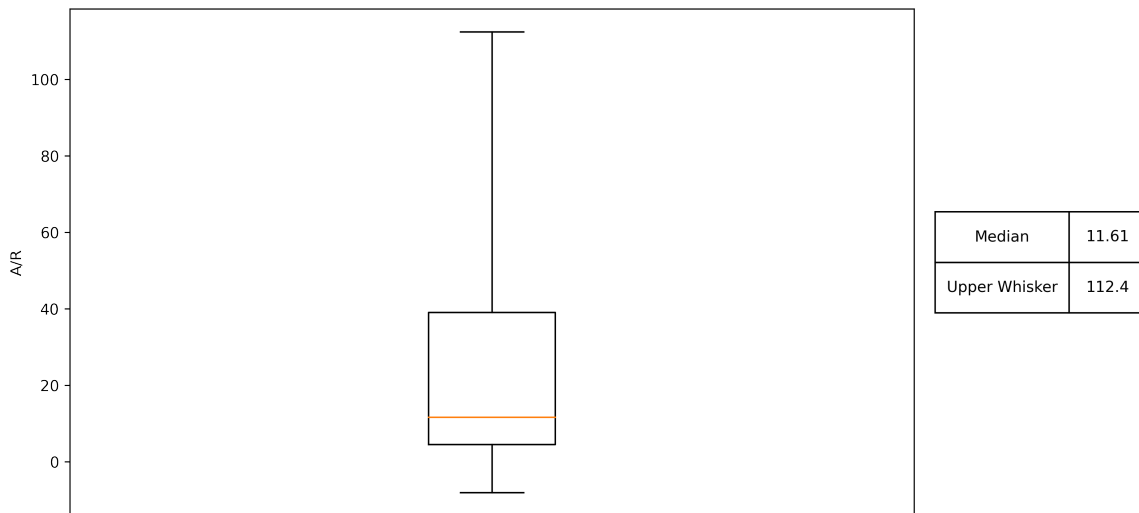
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	21	1432.81	23.22	23.11	0.0	66.57	112.4	--
A-R	21	1432.81	106.98	83.32	-5.1	364.48	194.69	--

Figure 45-1. Histogram of A/R for PISTACHIO-YOUNG fields in the Coalition.



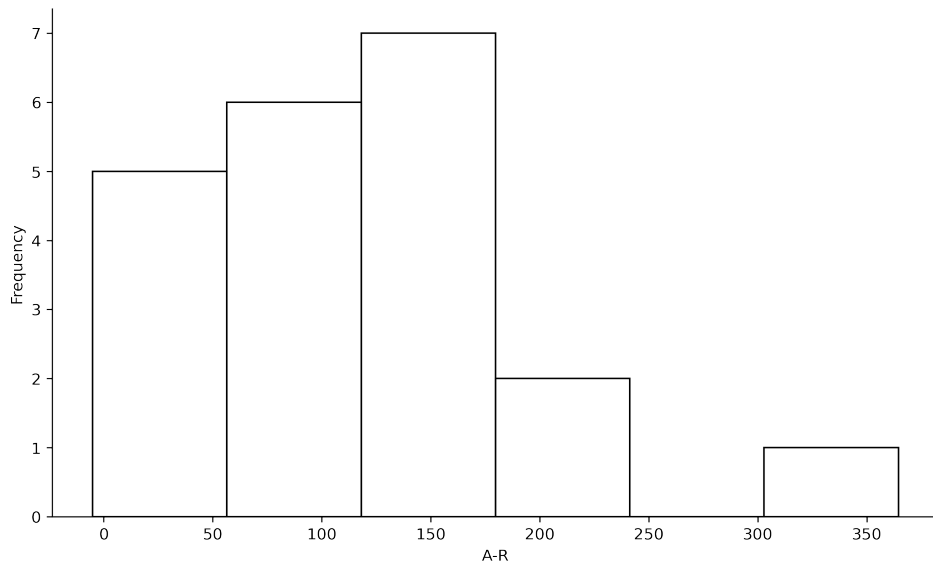
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 45-2. Box and whisker plot of A/R for PISTACHIO-YOUNG fields in the Coalition.



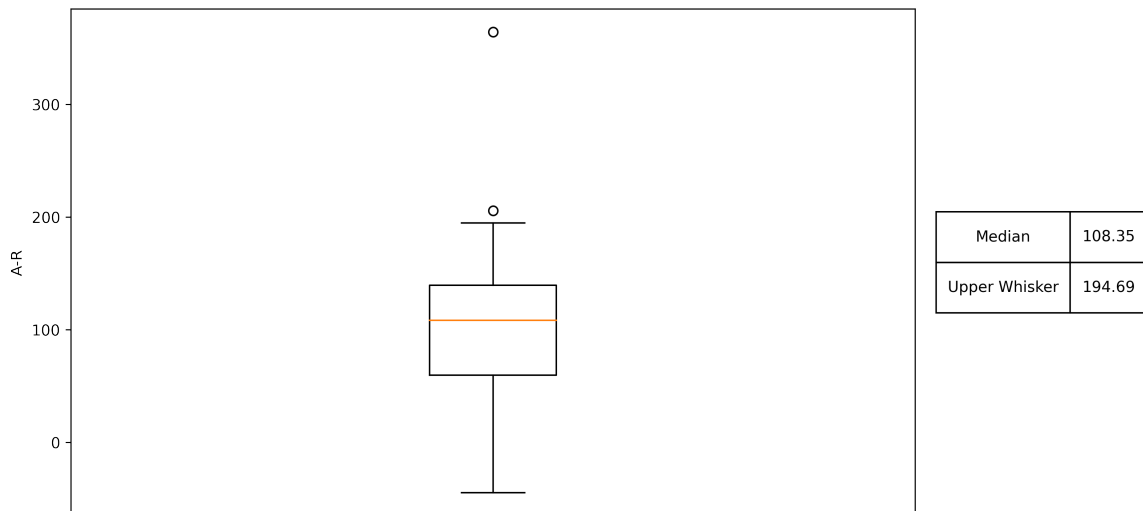
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 45-3. Histogram of A-R for PISTACHIO-YOUNG fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 45-4. Box and whisker plot of A-R for PISTACHIO-YOUNG fields in the Coalition.



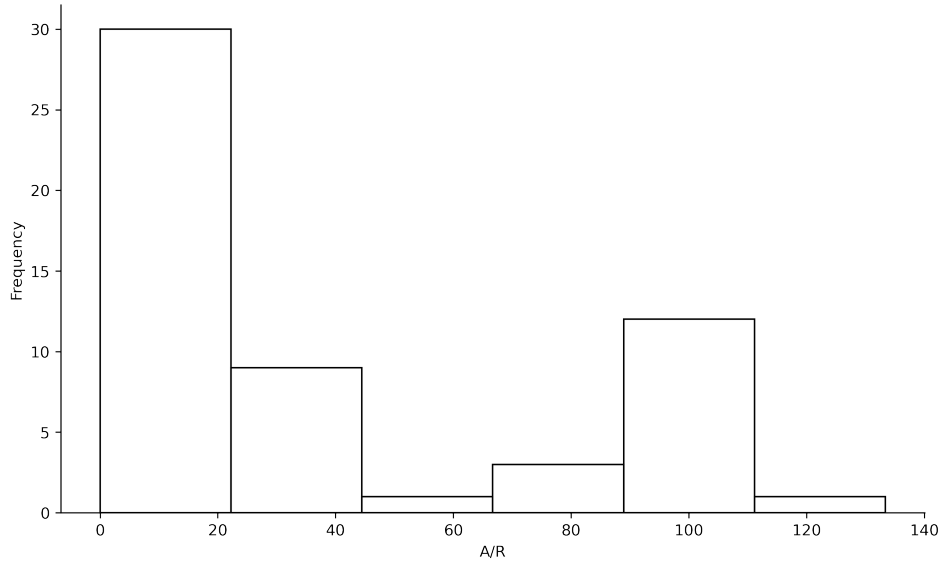
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

46. PLUM/PLUOT

Table 46-1. Summary statistics for PLUM/PLUOT fields in Coalition.

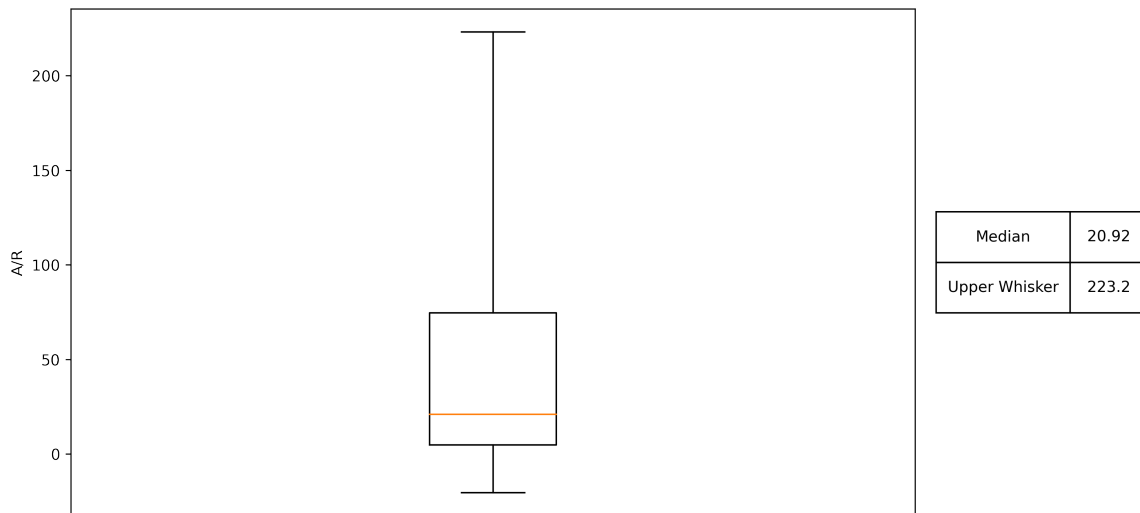
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	56	1789.35	41.05	43.31	0.0	133.4	223.2	0
A-R	56	1789.35	126.48	134.9	-4.68	371.6	335.68	12

Figure 46-1. Histogram of A/R for PLUM/PLUOT fields in the Coalition.



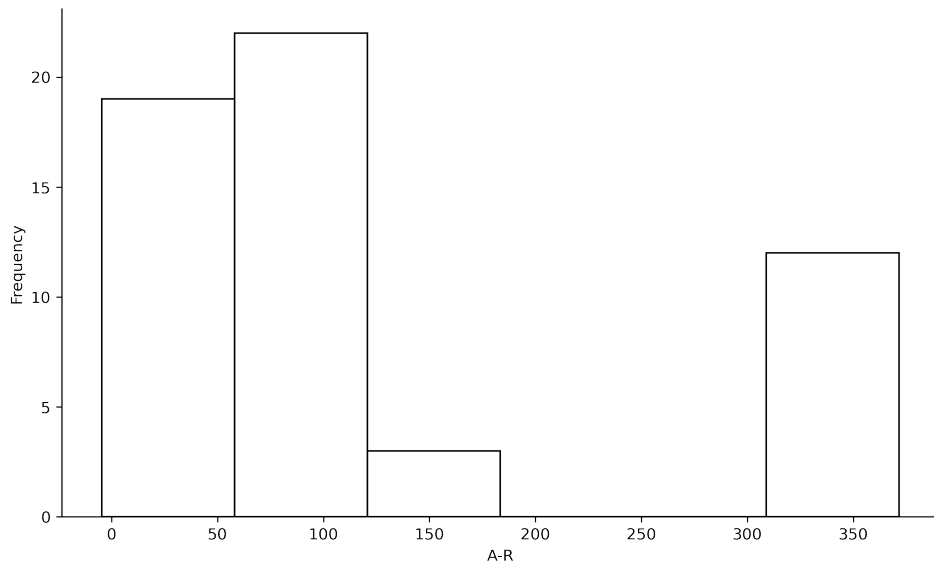
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 46-2. Box and whisker plot of A/R for PLUM/PLUOT fields in the Coalition.



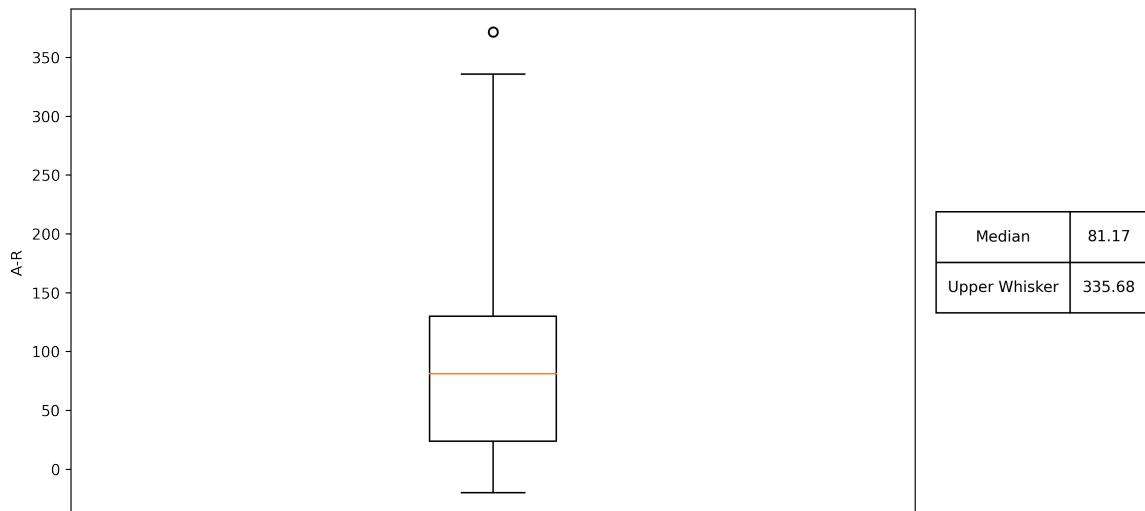
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 46-3. Histogram of A-R for PLUM/PLUOT fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 46-4. Box and whisker plot of A-R for PLUM/PLUOT fields in the Coalition.



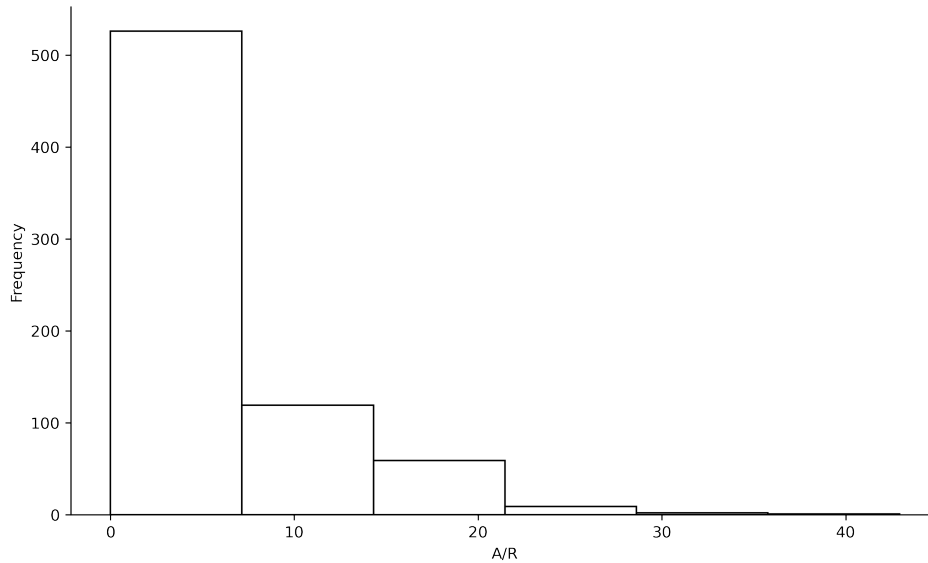
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

47. PRUNE

Table 47-1. Summary statistics for PRUNE fields in Coalition.

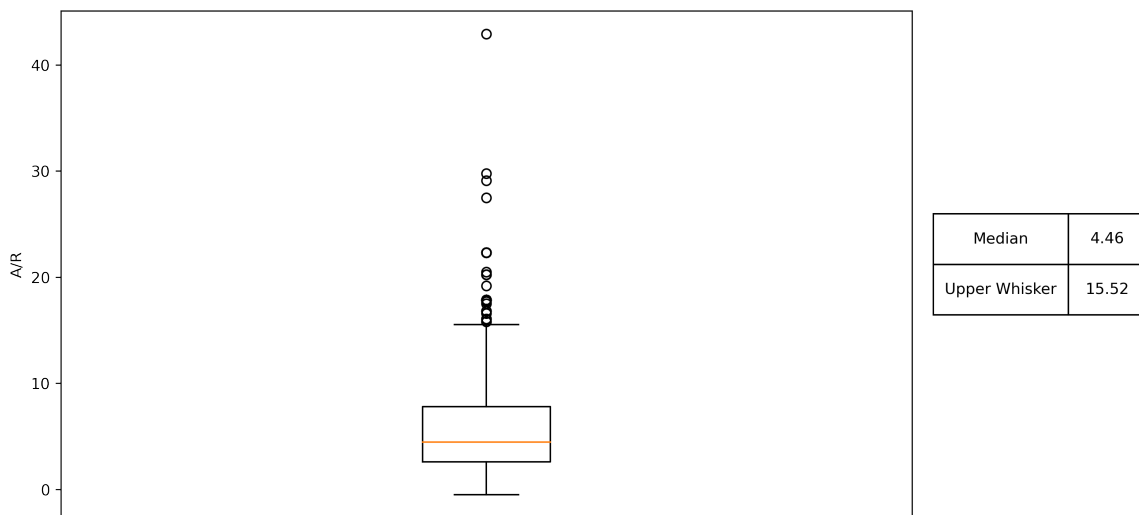
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	721	24962.94	6.5	7.59	0.0	71.43	15.52	65
A-R	721	24962.94	70.96	64.23	-50.4	477.6	142.12	48

Figure 47-1. Histogram of A/R for PRUNE fields in the Coalition.



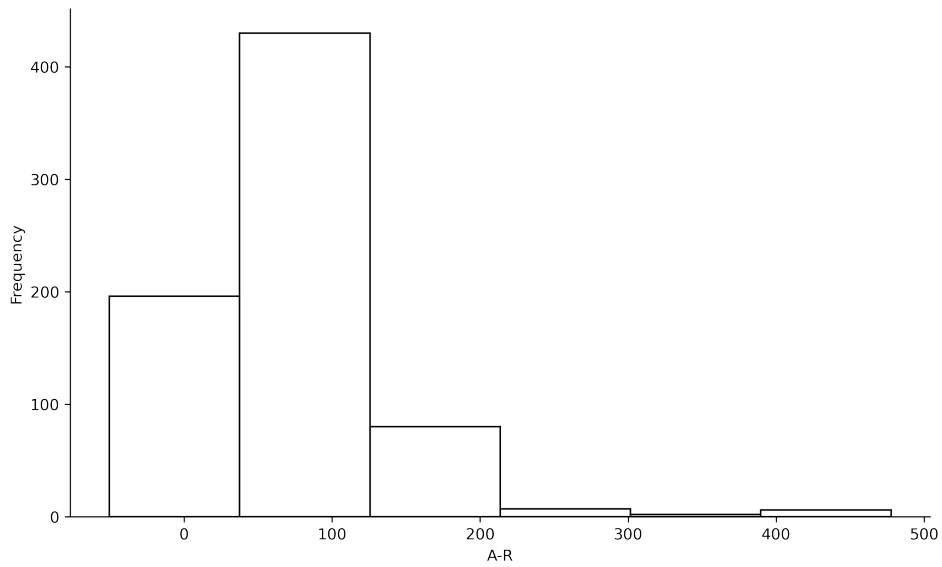
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 47-2. Box and whisker plot of A/R for PRUNE fields in the Coalition.



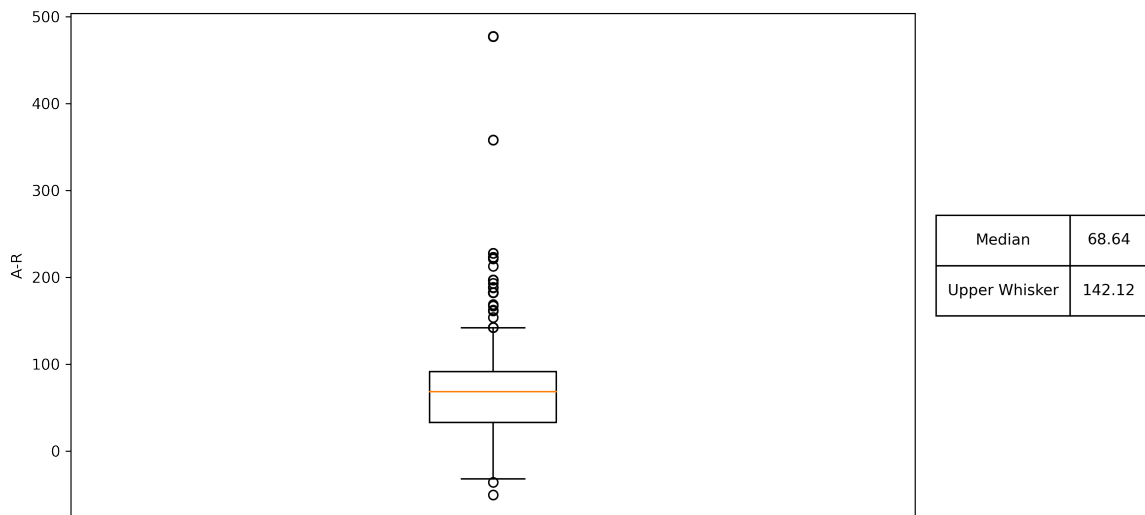
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 47-3. Histogram of A-R for PRUNE fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 47-4. Box and whisker plot of A-R for PRUNE fields in the Coalition.



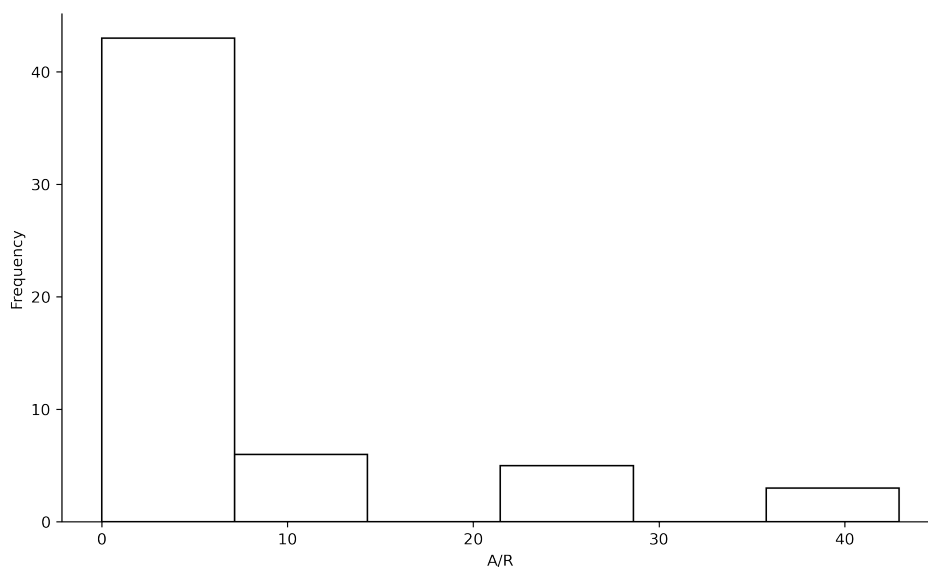
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

48. PRUNE-YOUNG

Table 48-1. Summary statistics for PRUNE-YOUNG fields in Coalition.

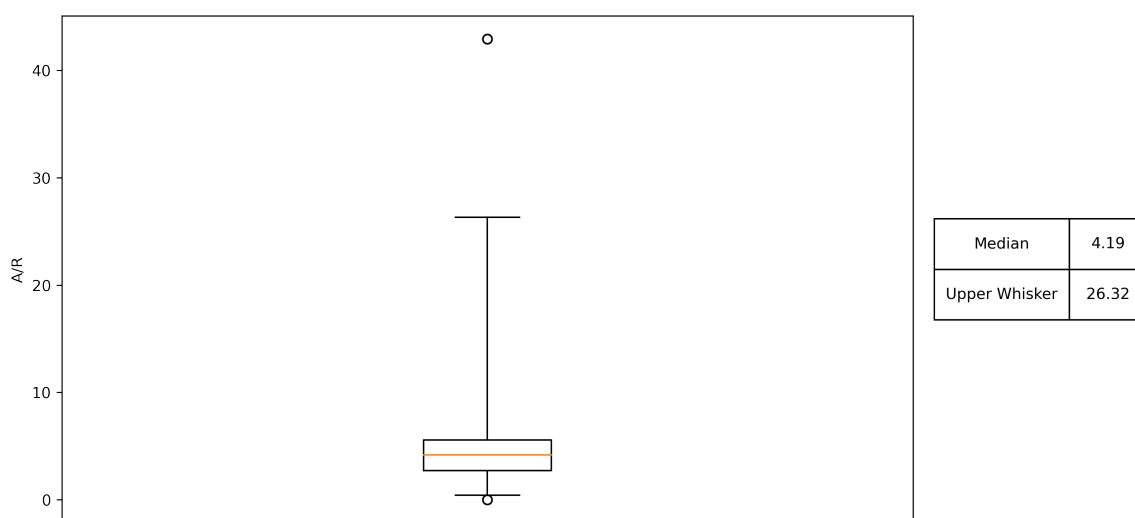
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	63	2094.11	19.69	38.59	0.0	133.93	26.32	--
A-R	63	2094.11	101.0	102.32	-35.84	372.2	226.42	--

Figure 48-1. Histogram of A/R for PRUNE-YOUNG fields in the Coalition.



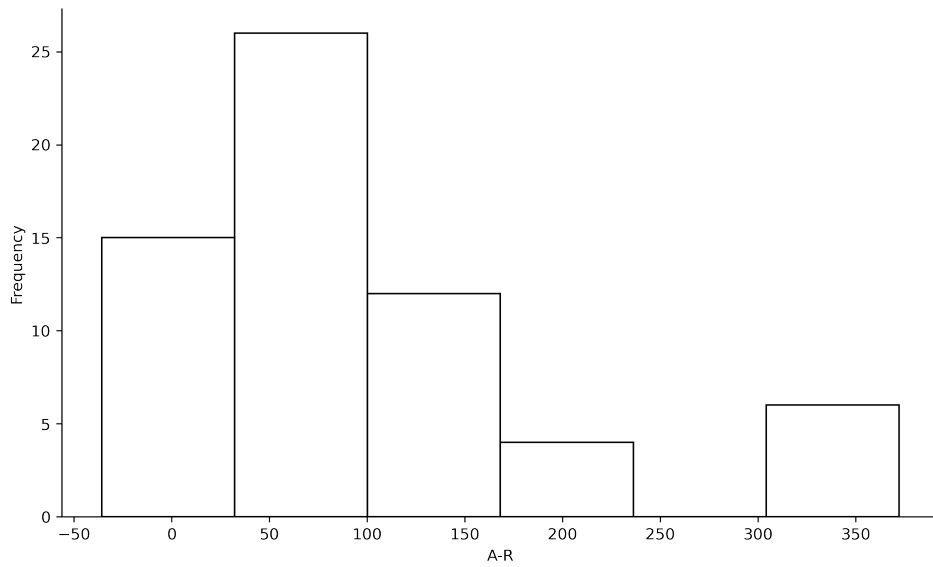
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 48-2. Box and whisker plot of A/R for PRUNE-YOUNG fields in the Coalition.



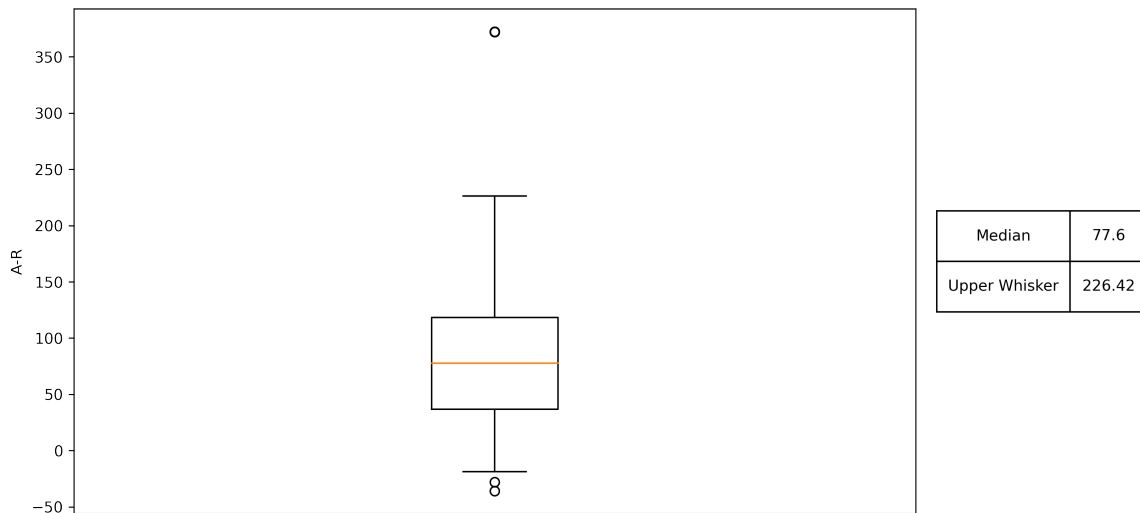
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 48-3. Histogram of A-R for PRUNE-YOUNG fields in the Coalition.



Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 48-4. Box and whisker plot of A-R for PRUNE-YOUNG fields in the Coalition.



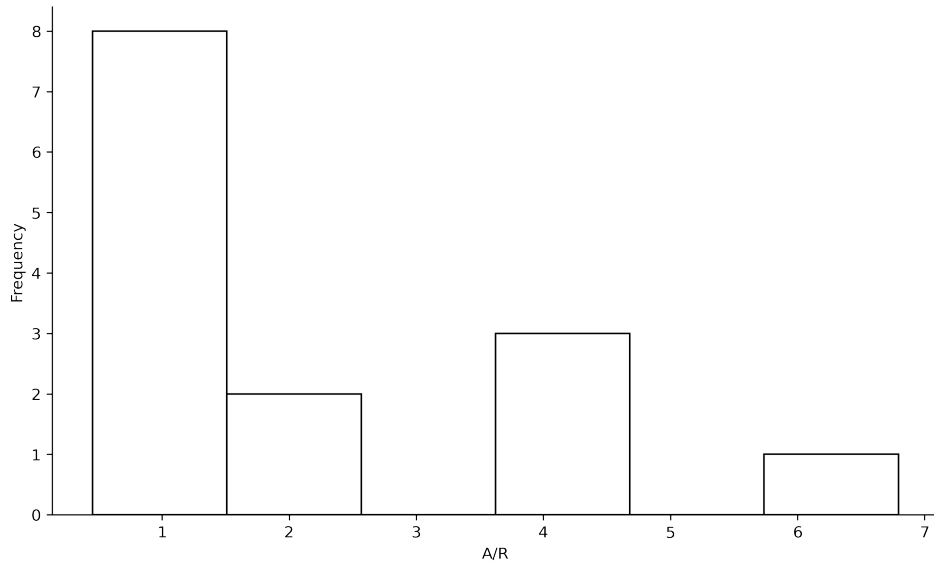
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

49. PUMPKIN

Table 49-1. Summary statistics for PUMPKIN fields in Coalition.

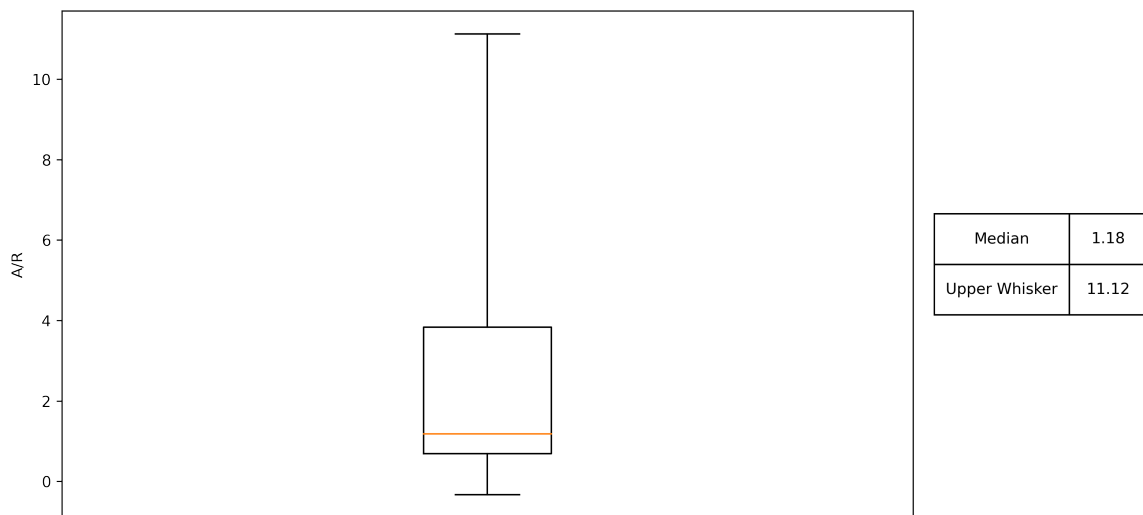
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	15	234.95	2.16	2.04	0.45	6.79	11.12	0
A-R	15	234.95	54.82	115.53	-45.4	258.4	258.15	3

Figure 49-1. Histogram of A/R for PUMPKIN fields in the Coalition.



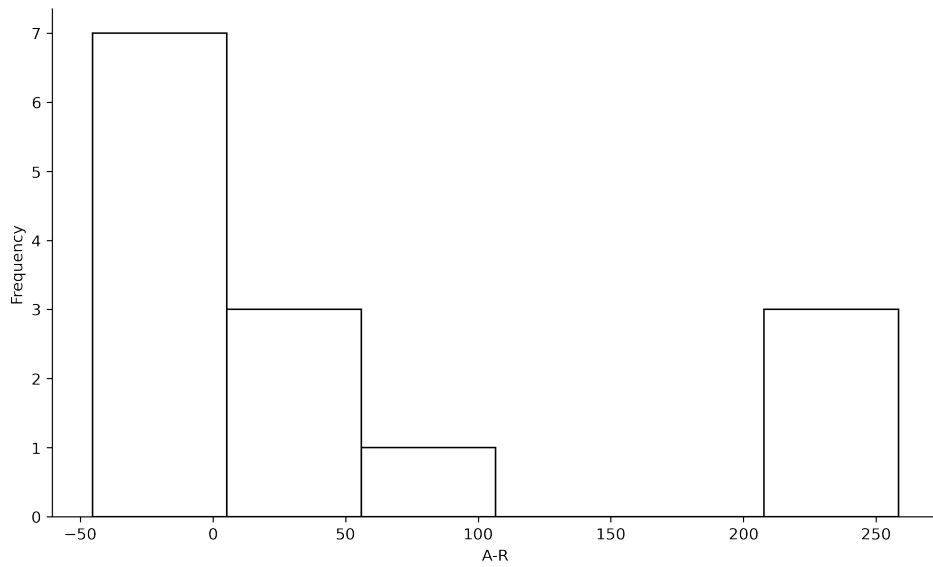
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 49-2. Box and whisker plot of A/R for PUMPKIN fields in the Coalition.



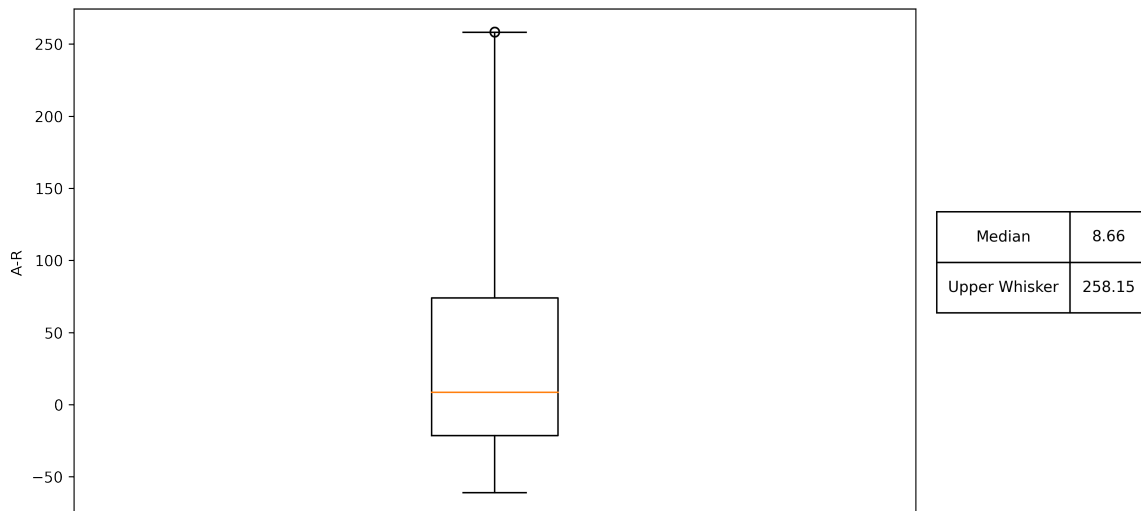
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 49-3. Histogram of A-R for PUMPKIN fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 49-4. Box and whisker plot of A-R for PUMPKIN fields in the Coalition.



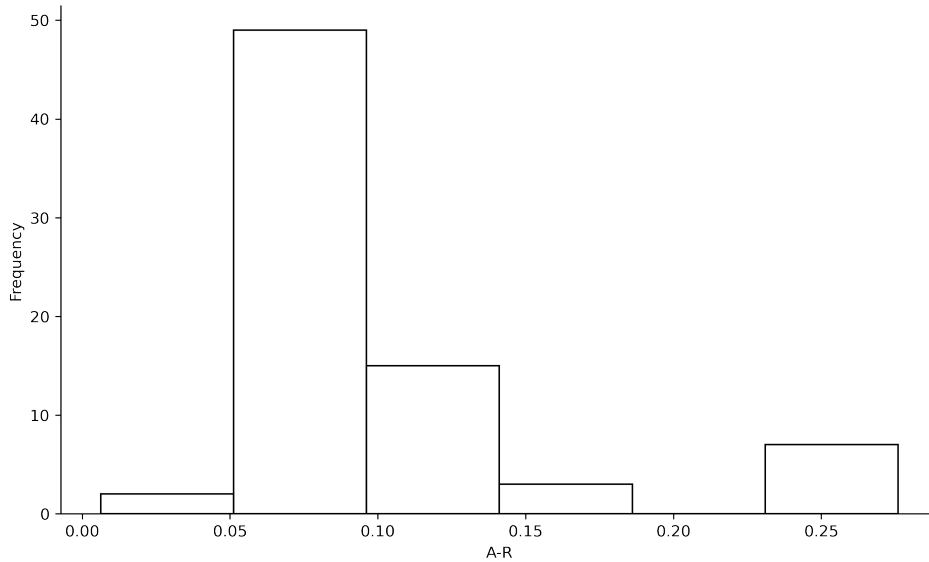
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

50. RICE - WILD

Table 50-1. Summary statistics for RICE - WILD fields in Coalition.

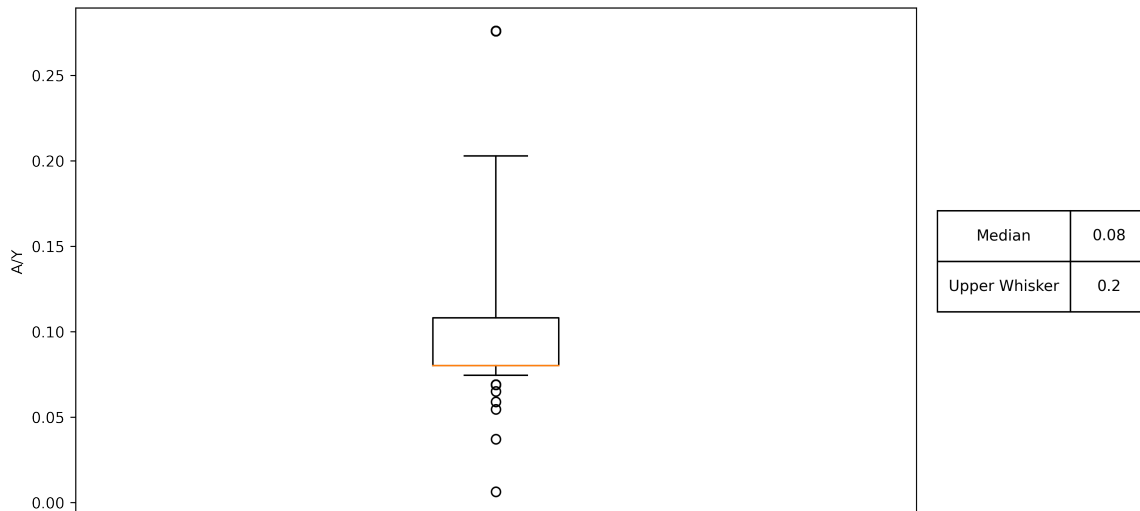
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/Y	76	6178.0	0.11	0.06	0.01	0.28	0.2	7

Figure 50-1. Histogram of A/Y for RICE - WILD fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot

Figure 50-2. Box and whisker plot of A/Y for RICE - WILD fields in the Coalition.



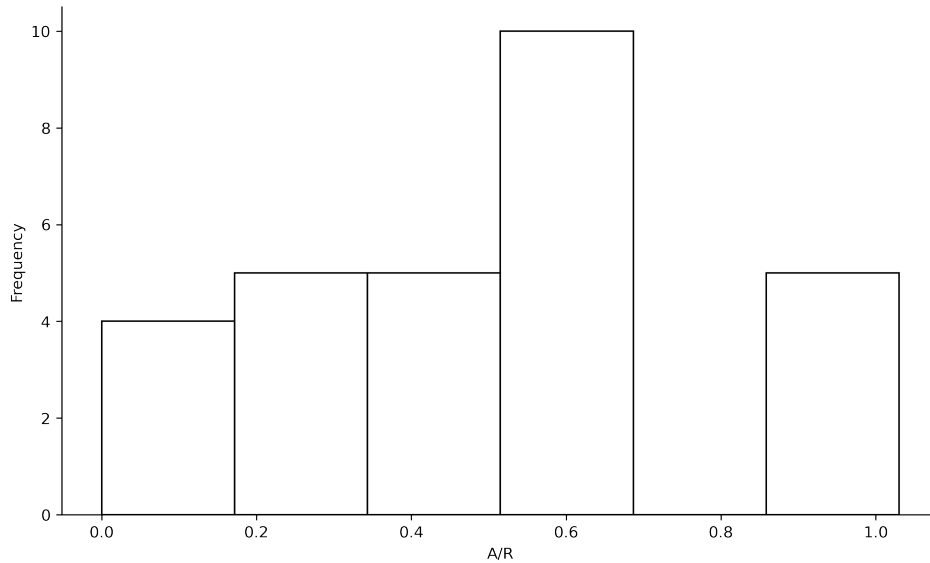
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot
 The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

51. RYEGRASS - HAY

Table 51-1. Summary statistics for RYEGRASS - HAY fields in Coalition.

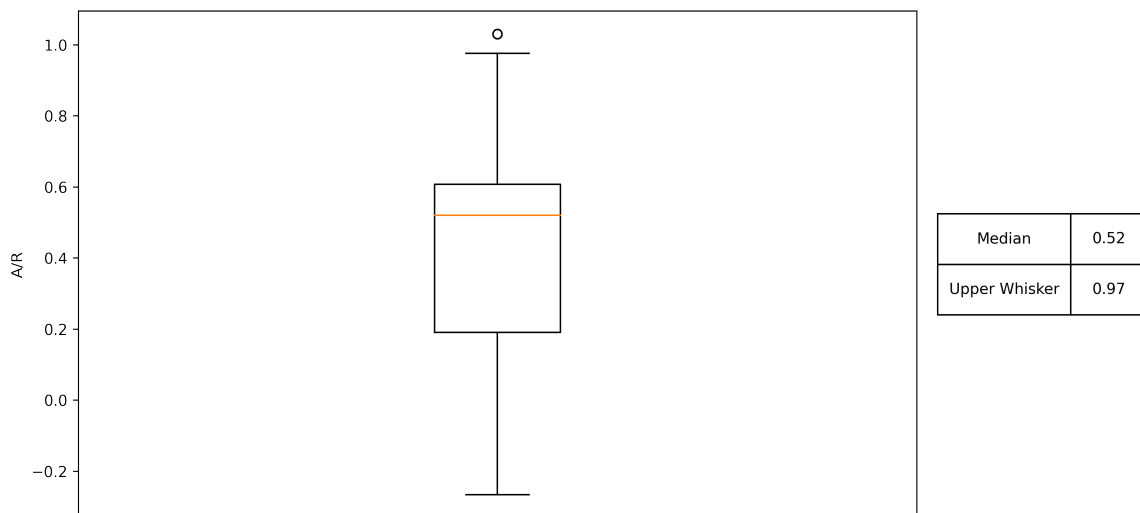
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	29	1161.26	0.48	0.3	0.0	1.03	0.97	2
A-R	29	1161.26	-93.13	69.64	-254.58	4.04	-39.23	5

Figure 51-1. Histogram of A/R for RYEGRASS - HAY fields in the Coalition.



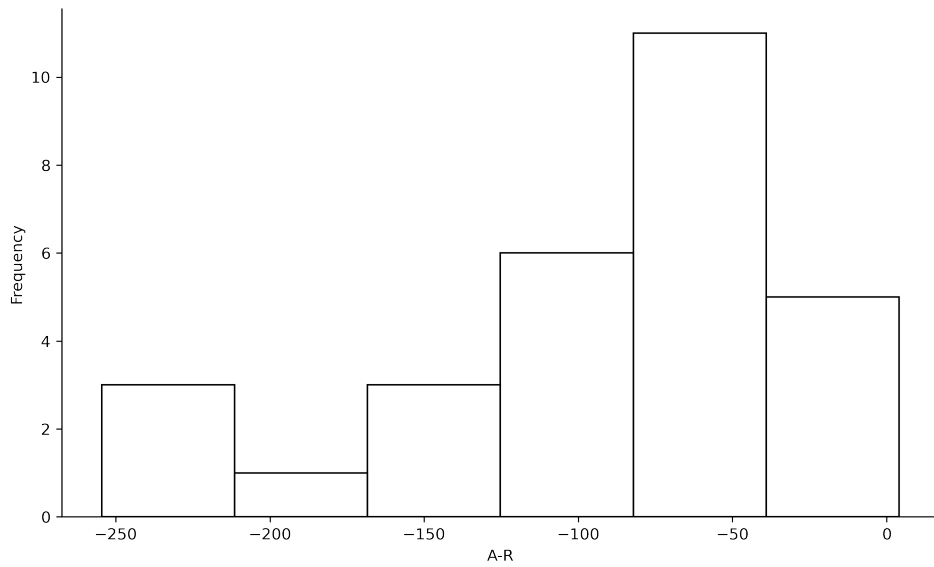
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 51-2. Box and whisker plot of A/R for RYEGRASS - HAY fields in the Coalition.



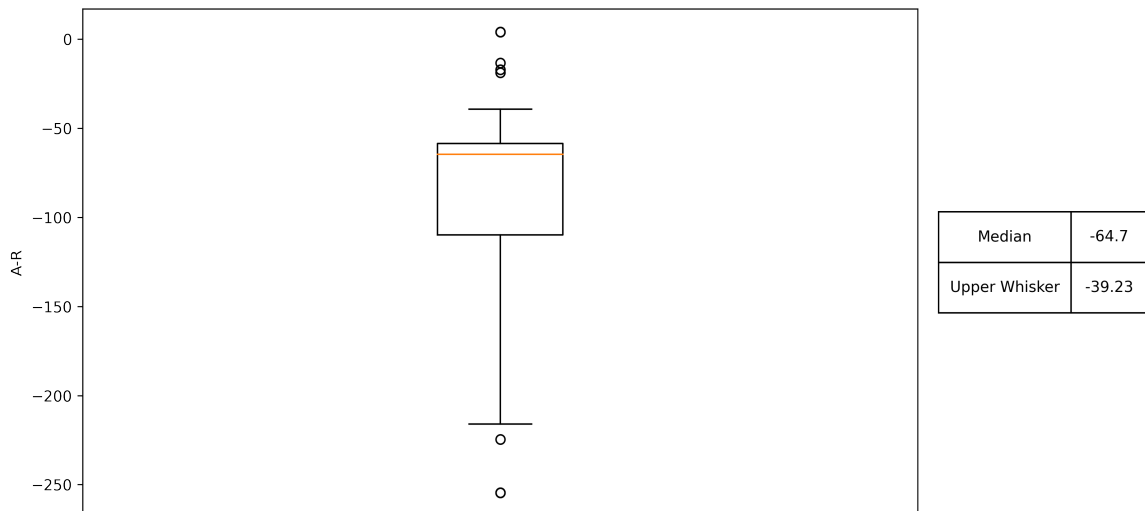
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 51-3. Histogram of A-R for RYEGRASS - HAY fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 51-4. Box and whisker plot of A-R for RYEGRASS - HAY fields in the Coalition.



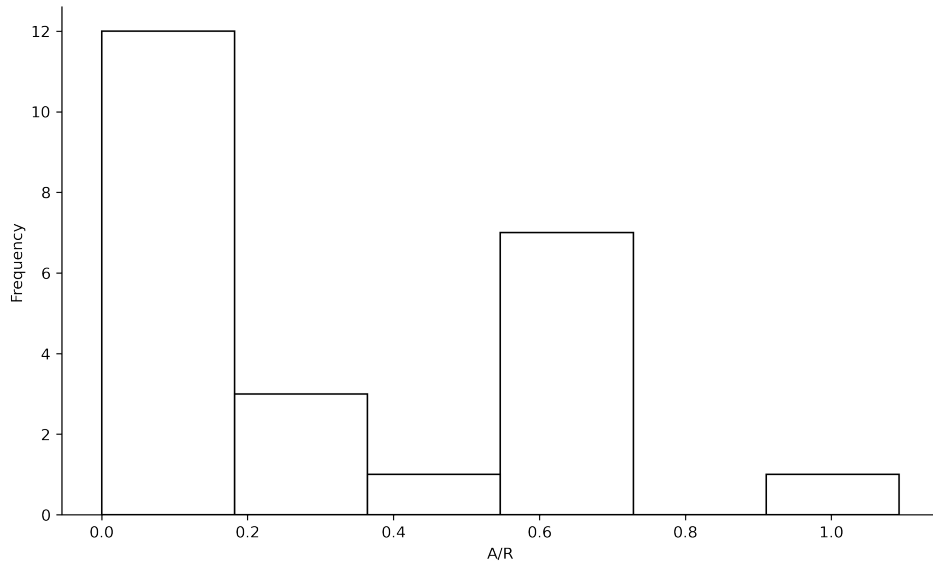
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

52. RYEGRASS - NR

Table 52-1. Summary statistics for RYEGRASS - NR fields in Coalition.

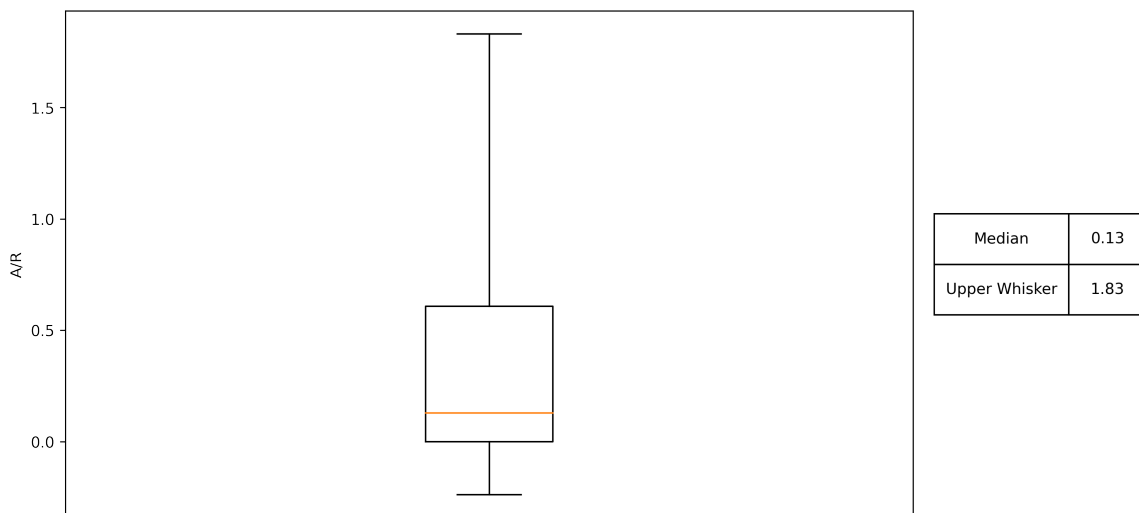
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	24	864.55	0.29	0.34	0.0	1.09	1.83	0
A-R	24	864.55	-165.59	93.31	-247.05	5.1	372.37	0

Figure 52-1. Histogram of A/R for RYEGRASS - NR fields in the Coalition.



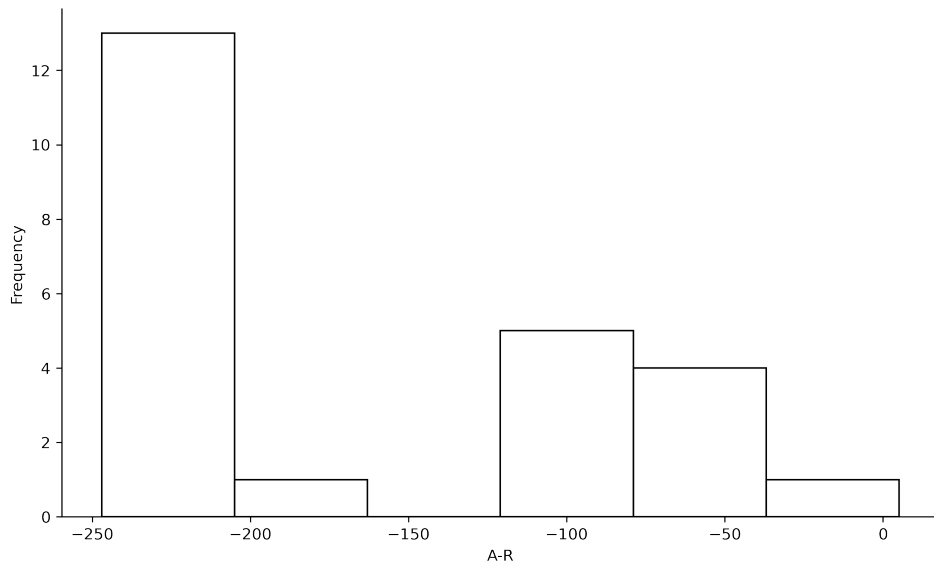
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 52-2. Box and whisker plot of A/R for RYEGRASS - NR fields in the Coalition.



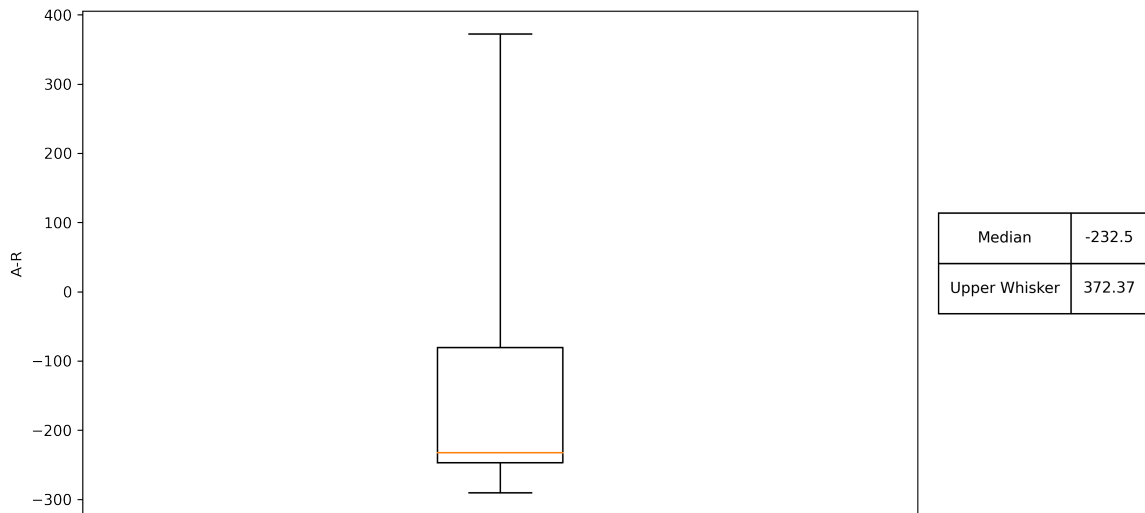
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 52-3. Histogram of A-R for RYEGRASS - NR fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 52-4. Box and whisker plot of A-R for RYEGRASS - NR fields in the Coalition.



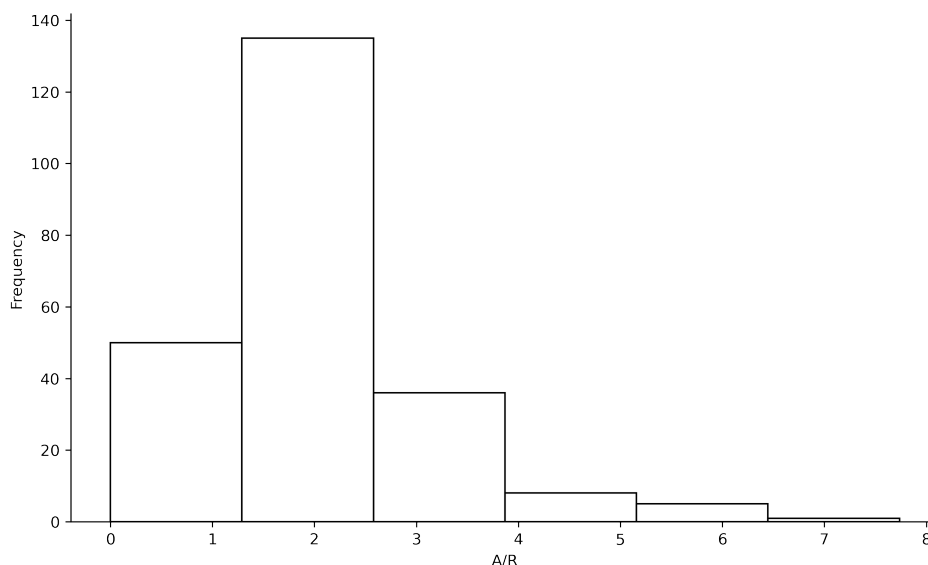
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

53. SAFFLOWER

Table 53-1. Summary statistics for SAFFLOWER fields in Coalition.

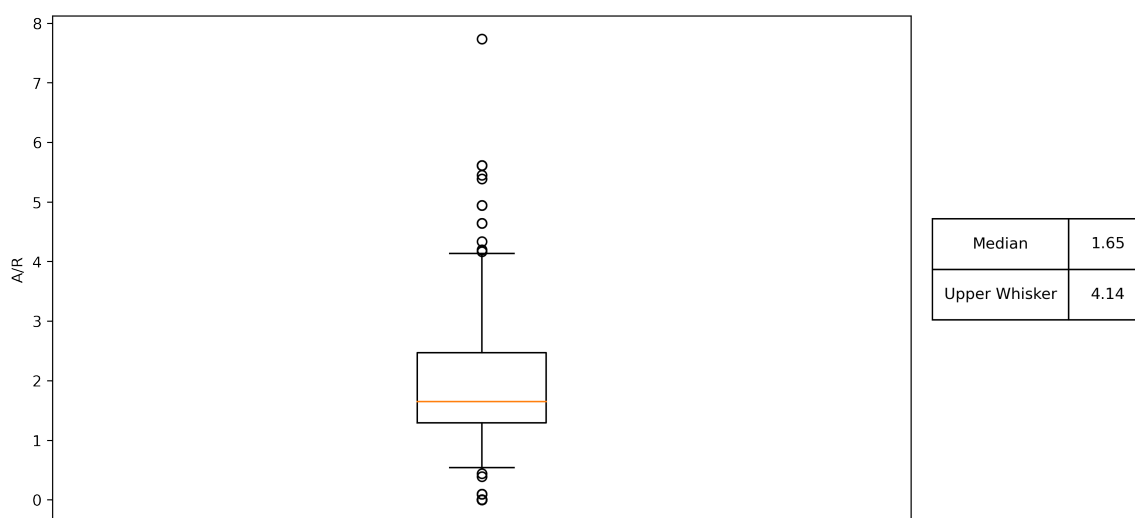
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	236	10890.58	1.92	1.35	0.0	11.52	4.14	14
A-R	236	10890.58	37.94	41.91	-158.5	114.25	113.16	1

Figure 53-1. Histogram of A/R for SAFFLOWER fields in the Coalition.



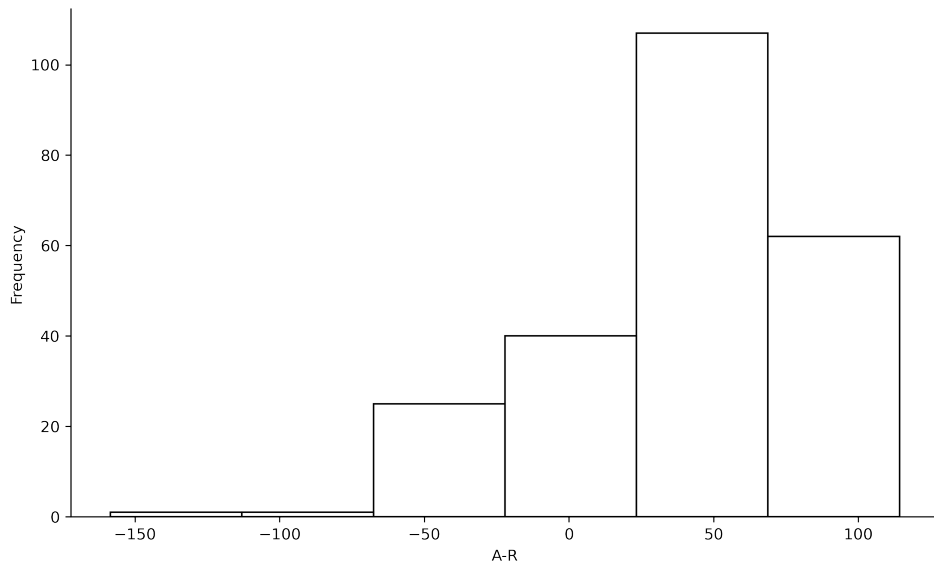
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 53-2. Box and whisker plot of A/R for SAFFLOWER fields in the Coalition.



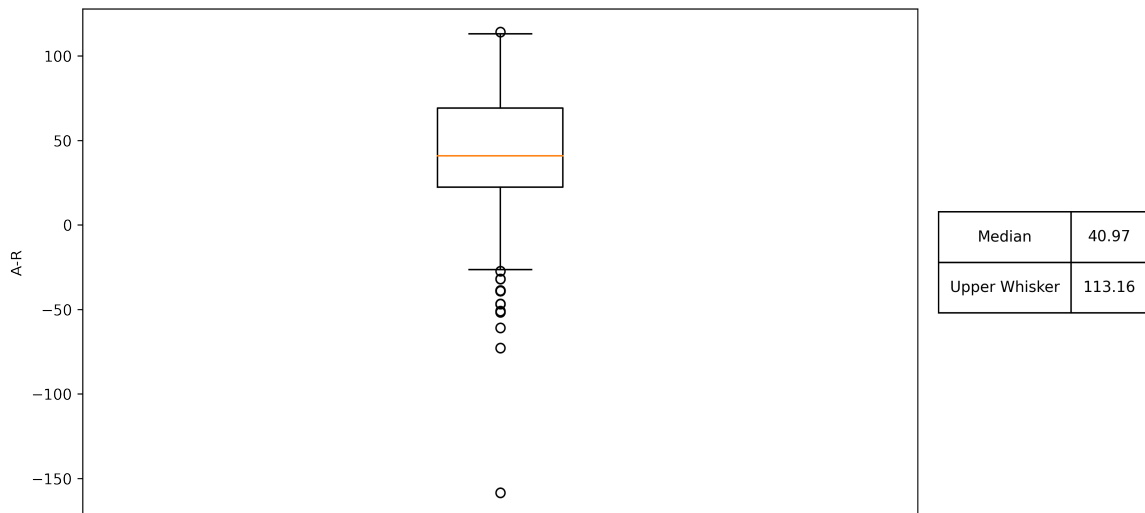
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 53-3. Histogram of A-R for SAFFLOWER fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 53-4. Box and whisker plot of A-R for SAFFLOWER fields in the Coalition.



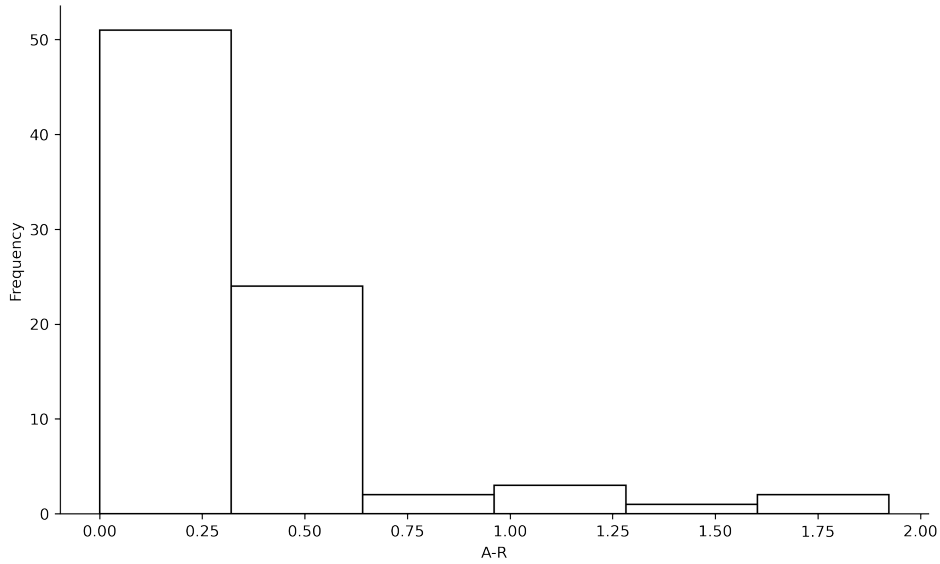
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

54. SEED CROP

Table 54-1. Summary statistics for SEED CROP fields in Coalition.

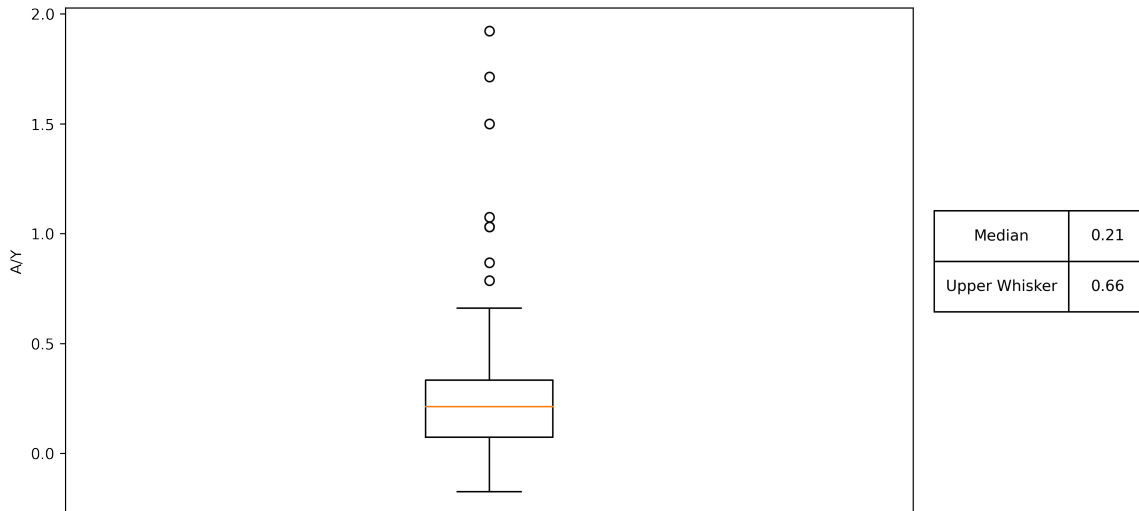
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/Y	86	2623.77	0.41	0.74	0.0	5.07	0.66	11

Figure 54-1. Histogram of A/Y for SEED CROP fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot

Figure 54-2. Box and whisker plot of A/Y for SEED CROP fields in the Coalition.



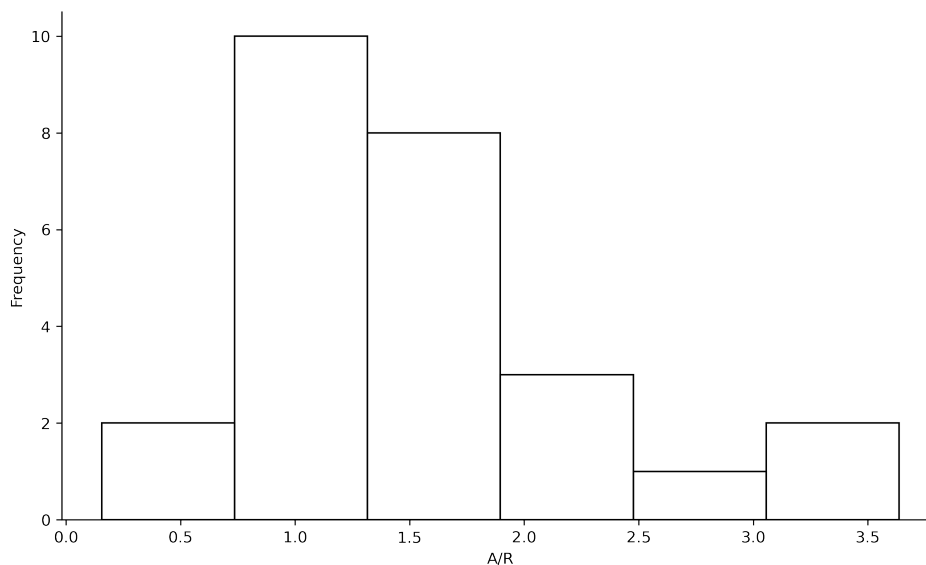
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot
The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

55. SORGHUM/MILO - GRAIN

Table 55-1. Summary statistics for SORGHUM/MILO - GRAIN fields in Coalition.

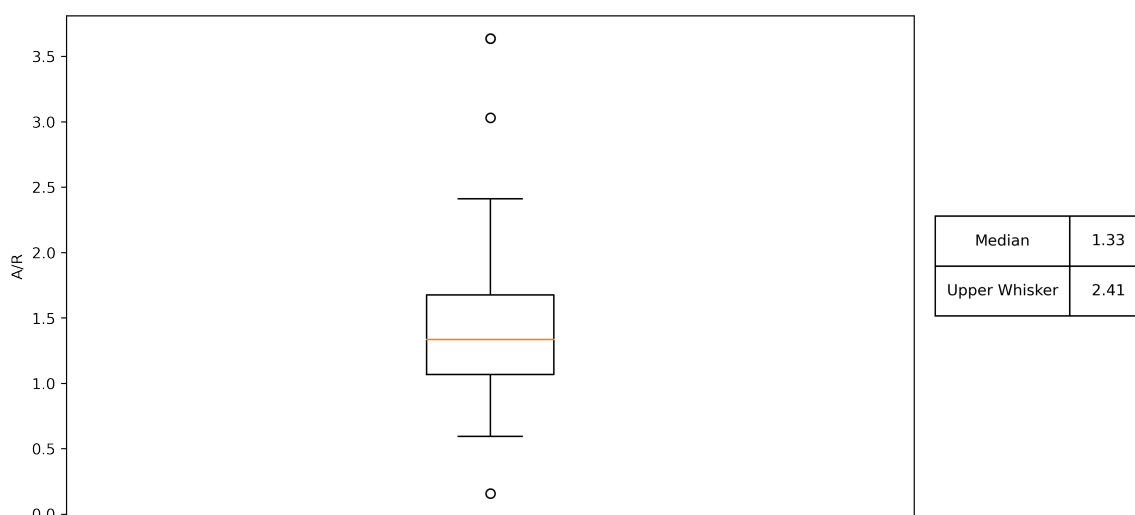
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	26	936.97	1.5	0.82	0.16	3.64	2.41	3
A-R	26	936.97	30.67	44.58	-83.87	134.0	113.15	1

Figure 55-1. Histogram of A/R for SORGHUM/MILO - GRAIN fields in the Coalition.



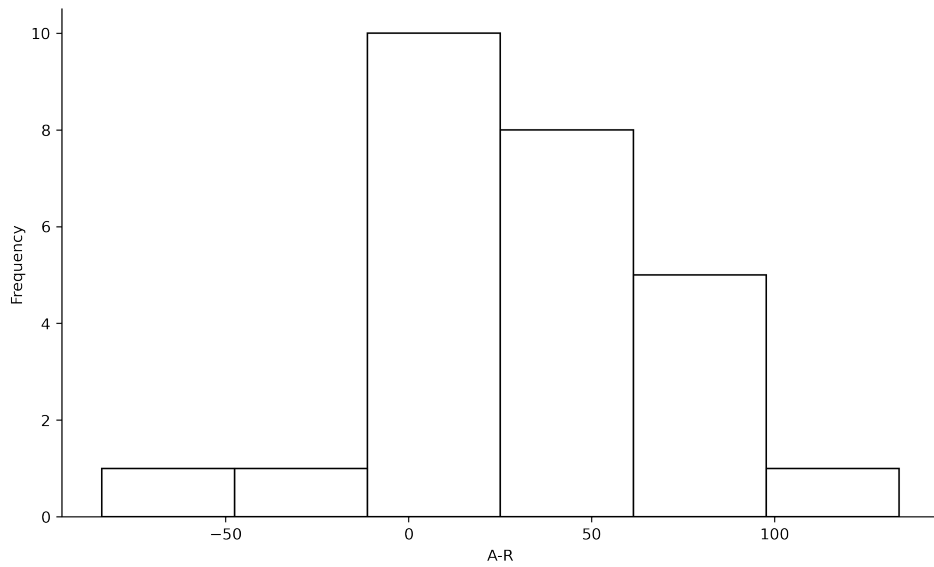
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 55-2. Box and whisker plot of A/R for SORGHUM/MILO - GRAIN fields in the Coalition.



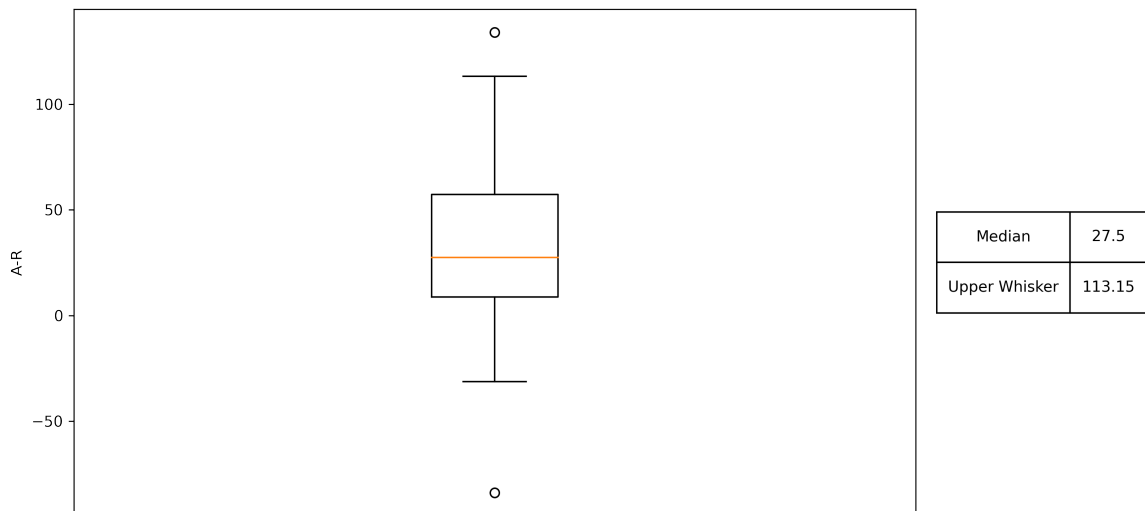
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 55-3. Histogram of A-R for SORGHUM/MILO - GRAIN fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 55-4. Box and whisker plot of A-R for SORGHUM/MILO - GRAIN fields in the Coalition.



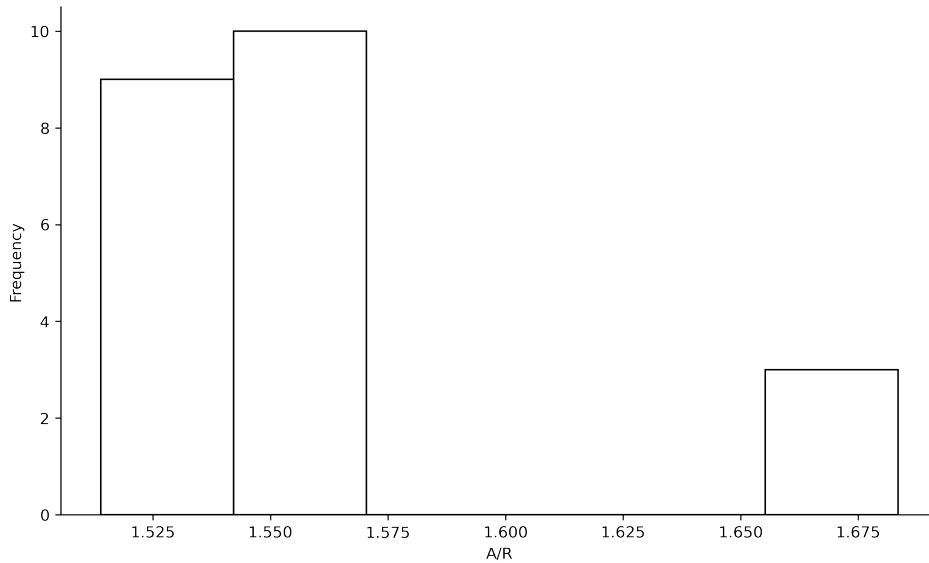
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

56. SORGHUM/MILO - NR

Table 56-1. Summary statistics for SORGHUM/MILO - NR fields in Coalition.

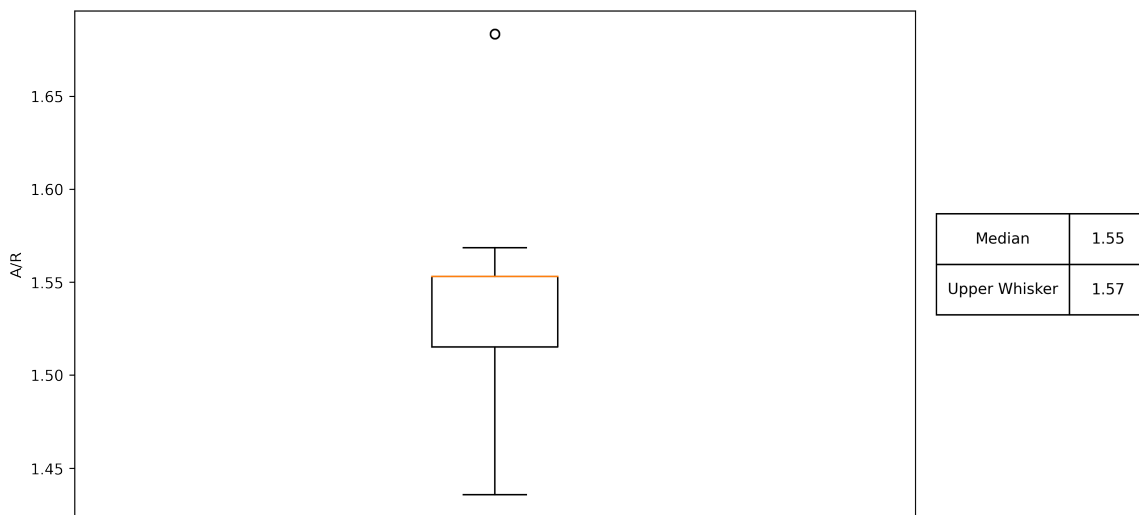
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	30	1177.8	1.39	0.37	0.14	1.96	1.57	4
A-R	30	1177.8	24.65	29.63	-73.8	49.25	53.74	0

Figure 56-1. Histogram of A/R for SORGHUM/MILO - NR fields in the Coalition.



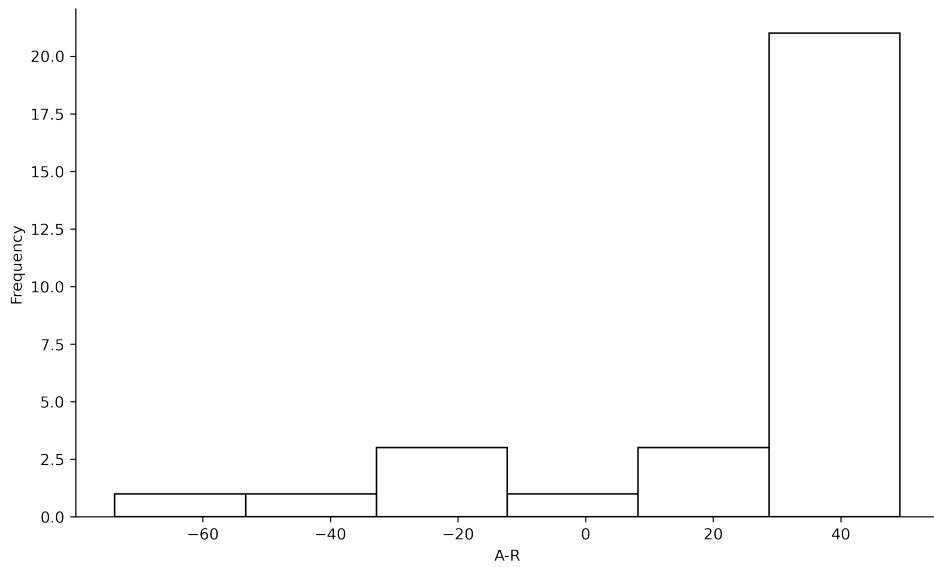
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 56-2. Box and whisker plot of A/R for SORGHUM/MILO - NR fields in the Coalition.



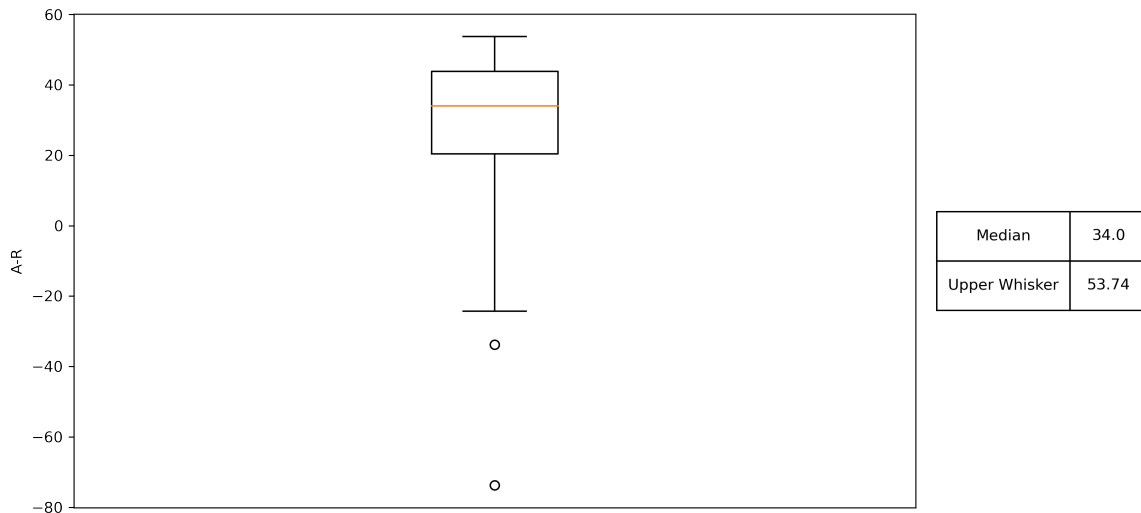
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 56-3. Histogram of A-R for SORGHUM/MILO - NR fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 56-4. Box and whisker plot of A-R for SORGHUM/MILO - NR fields in the Coalition.



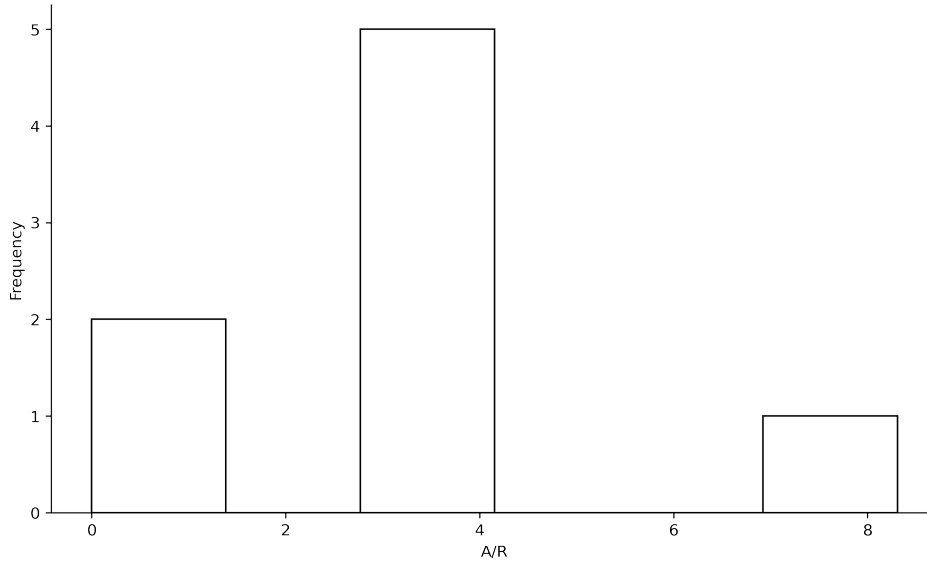
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

57. SQUASH

Table 57-1. Summary statistics for SQUASH fields in Coalition.

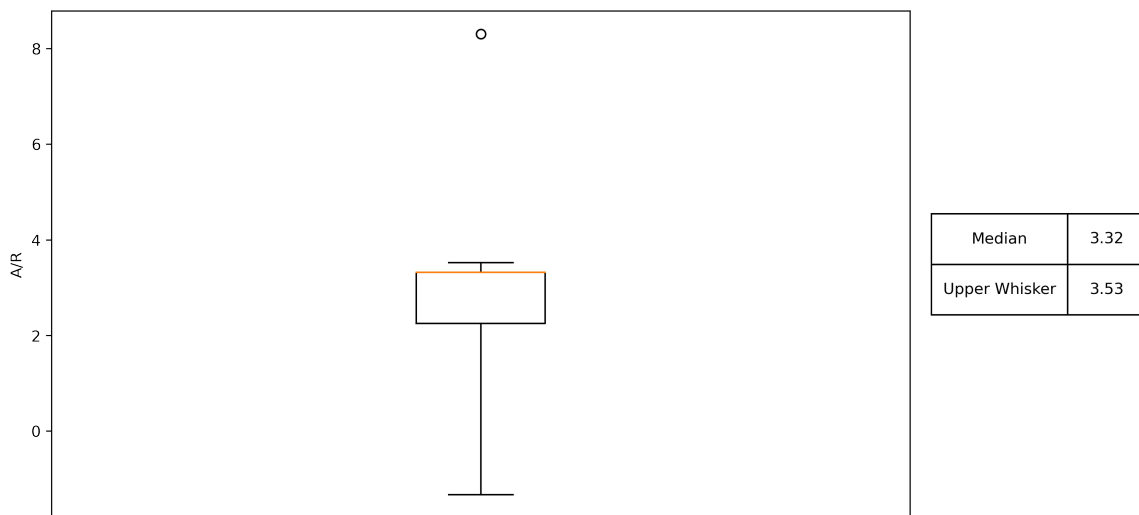
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	8	178.67	3.09	2.54	0.0	8.31	3.53	1
A-R	8	178.67	93.42	72.52	-22.02	148.78	191.4	0

Figure 57-1. Histogram of A/R for SQUASH fields in the Coalition.



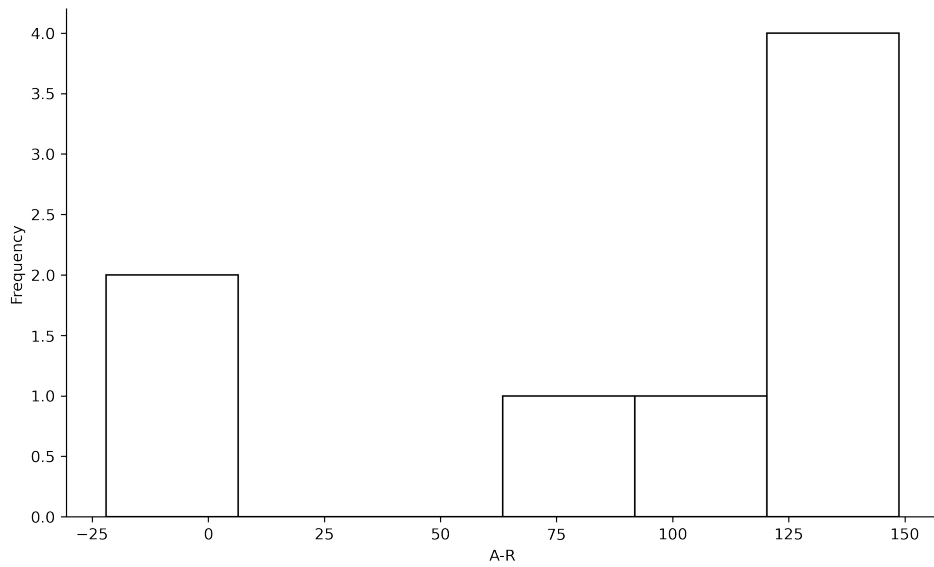
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 57-2. Box and whisker plot of A/R for SQUASH fields in the Coalition.



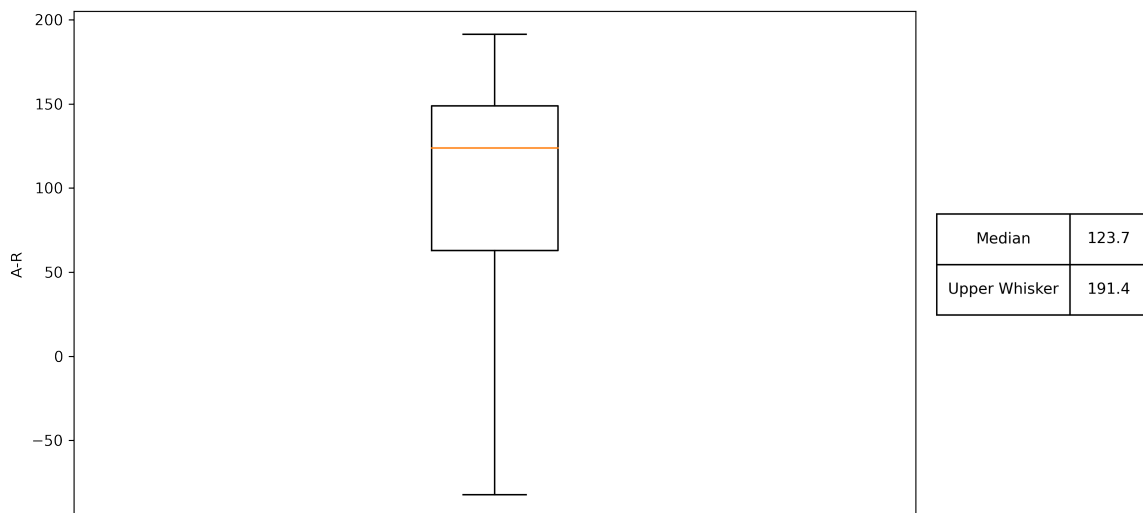
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 57-3. Histogram of A-R for SQUASH fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 57-4. Box and whisker plot of A-R for SQUASH fields in the Coalition.



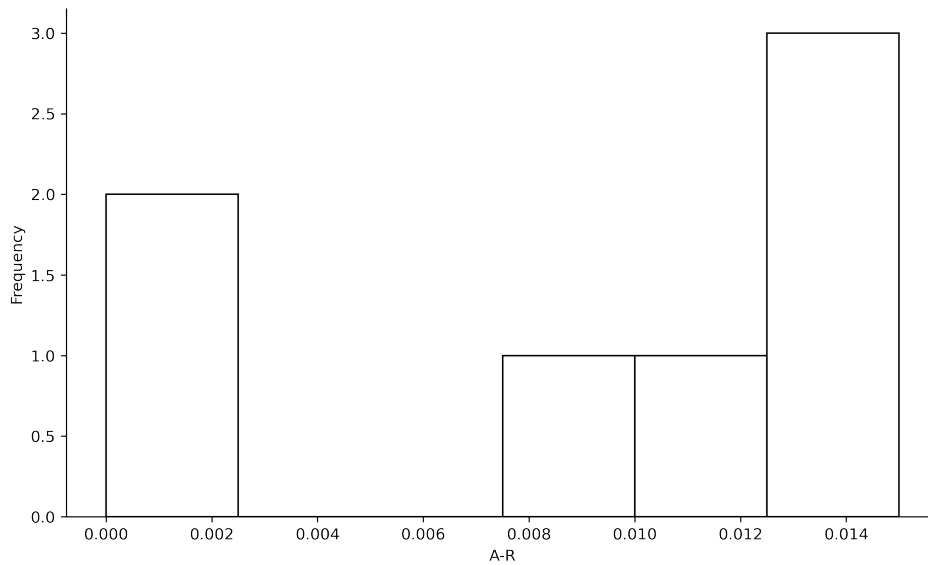
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

58. STRAWBERRY

Table 58-1. Summary statistics for STRAWBERRY fields in Coalition.

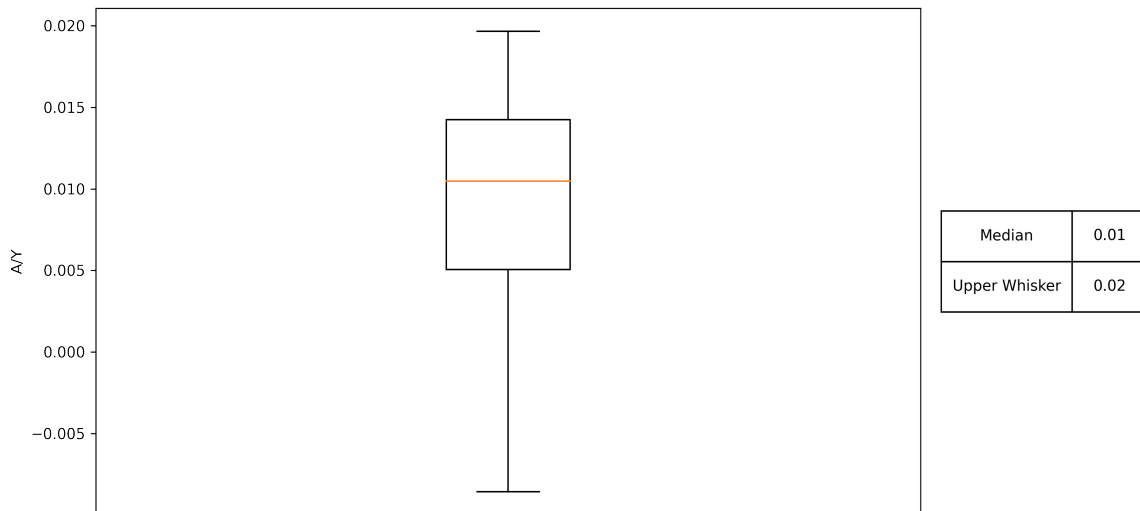
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/Y	13	295.49	0.01	0.01	0.0	0.02	0.02	0

Figure 58-1. Histogram of A/Y for STRAWBERRY fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot

Figure 58-2. Box and whisker plot of A/Y for STRAWBERRY fields in the Coalition.



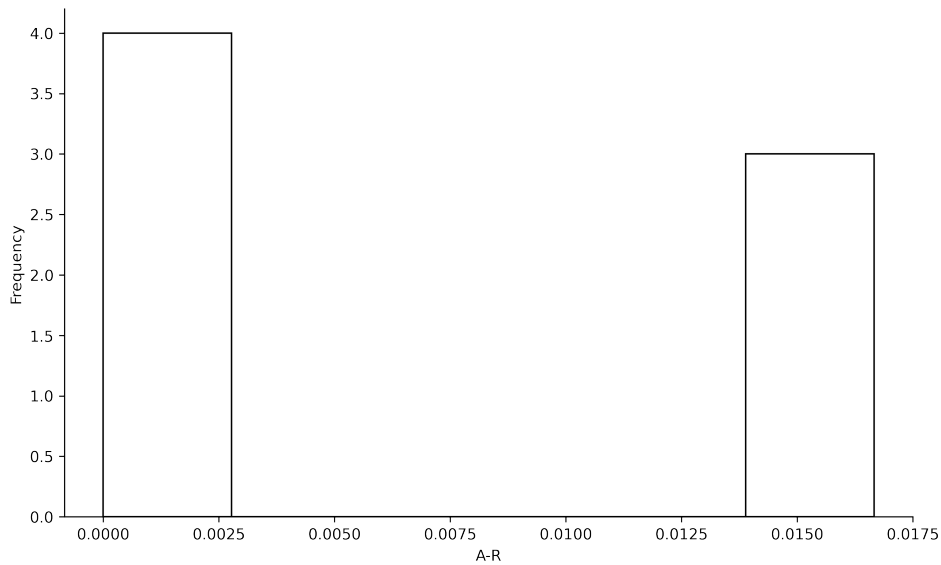
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot
The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

59. SUDAN GRASS - GREENCHOP

Table 59-1. Summary statistics for SUDAN GRASS - GREENCHOP fields in Coalition.

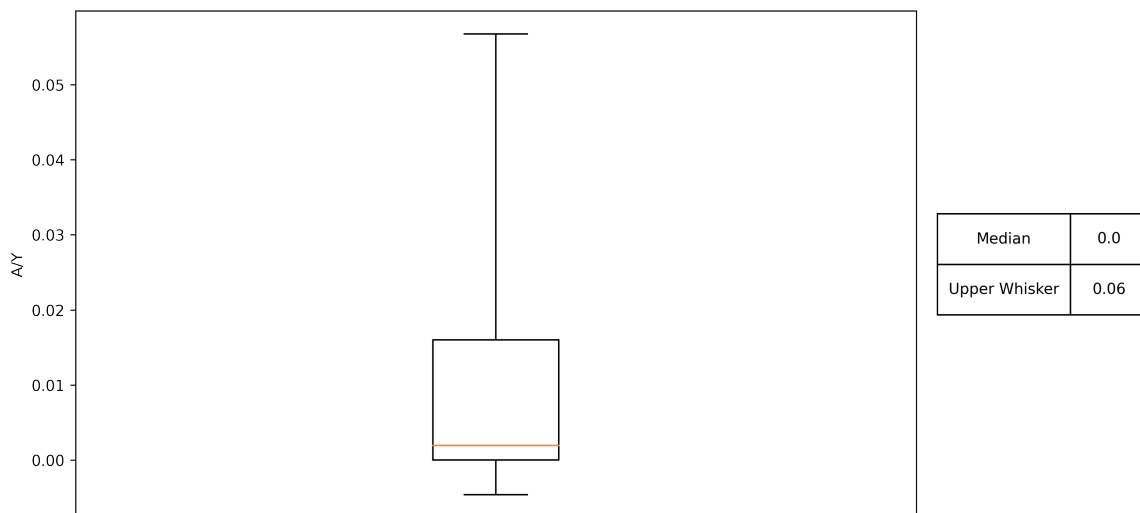
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/Y	7	124.9	0.01	0.01	0.0	0.02	0.06	0

Figure 59-1. Histogram of A/Y for SUDAN GRASS - GREENCHOP fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot

Figure 59-2. Box and whisker plot of A/Y for SUDAN GRASS - GREENCHOP fields in the Coalition.



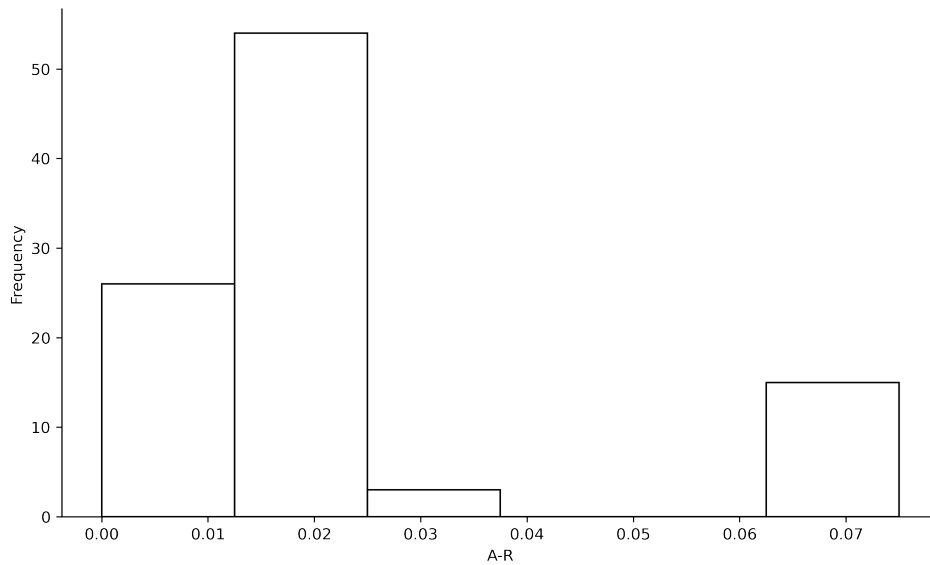
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot
The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

60. SUDAN GRASS - HAY

Table 60-1. Summary statistics for SUDAN GRASS - HAY fields in Coalition.

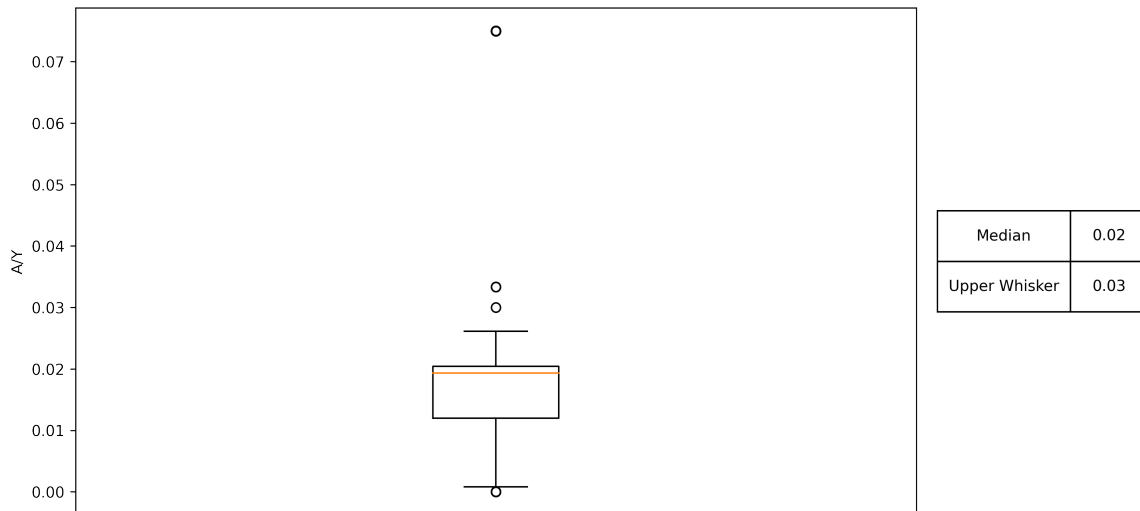
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/Y	98	7997.69	0.02	0.02	0.0	0.08	0.03	18

Figure 60-1. Histogram of A/Y for SUDAN GRASS - HAY fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot

Figure 60-2. Box and whisker plot of A/Y for SUDAN GRASS - HAY fields in the Coalition.



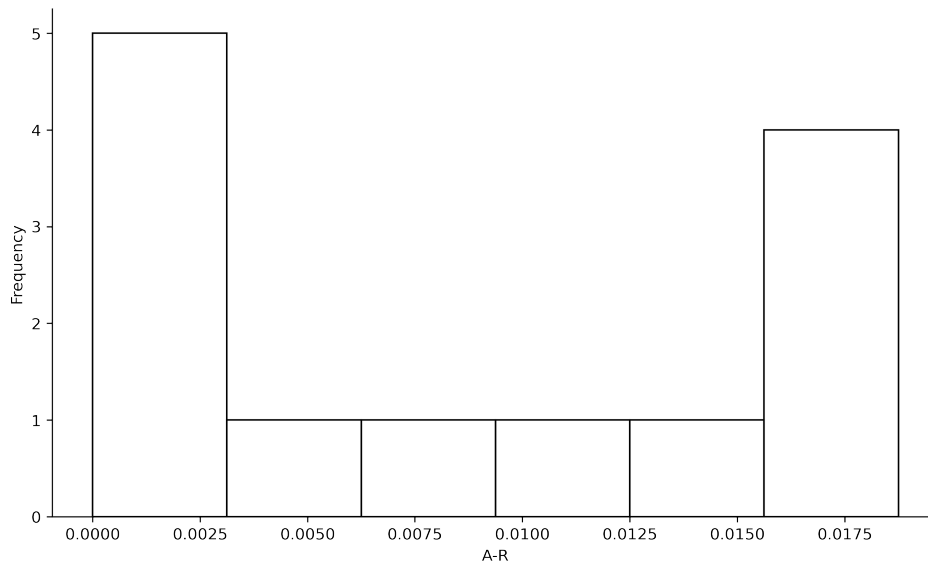
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot
The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

61. SUDAN GRASS - NR

Table 61-1. Summary statistics for SUDAN GRASS - NR fields in Coalition.

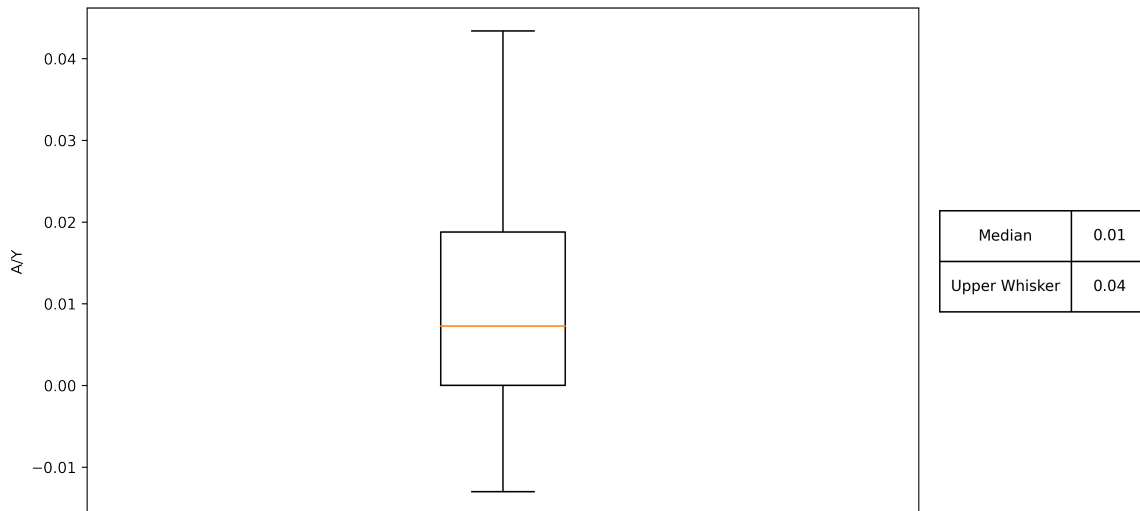
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/Y	13	1284.03	0.01	0.01	0.0	0.02	0.04	0

Figure 61-1. Histogram of A/Y for SUDAN GRASS - NR fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot

Figure 61-2. Box and whisker plot of A/Y for SUDAN GRASS - NR fields in the Coalition.



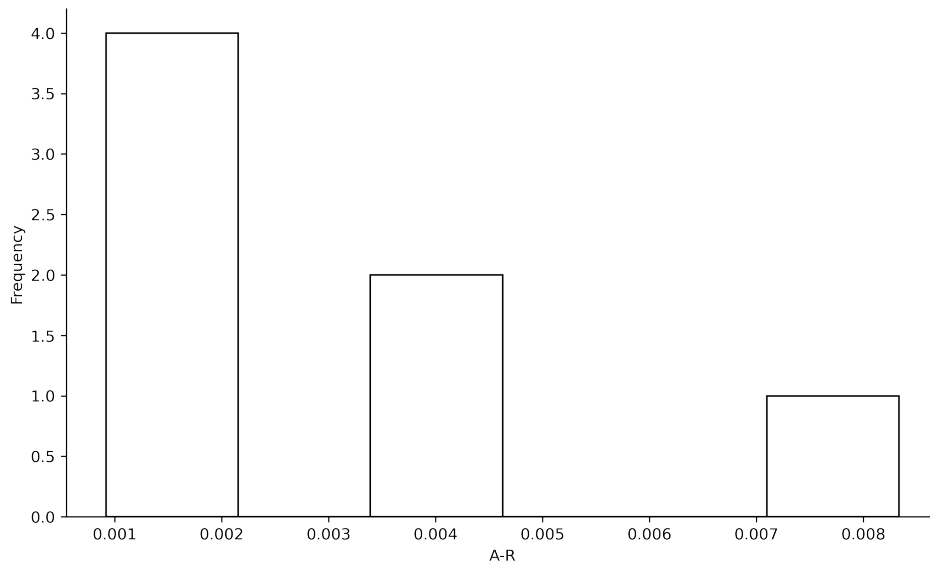
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot
The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

62. SUDAN GRASS - SILAGE

Table 62-1. Summary statistics for SUDAN GRASS - SILAGE fields in Coalition.

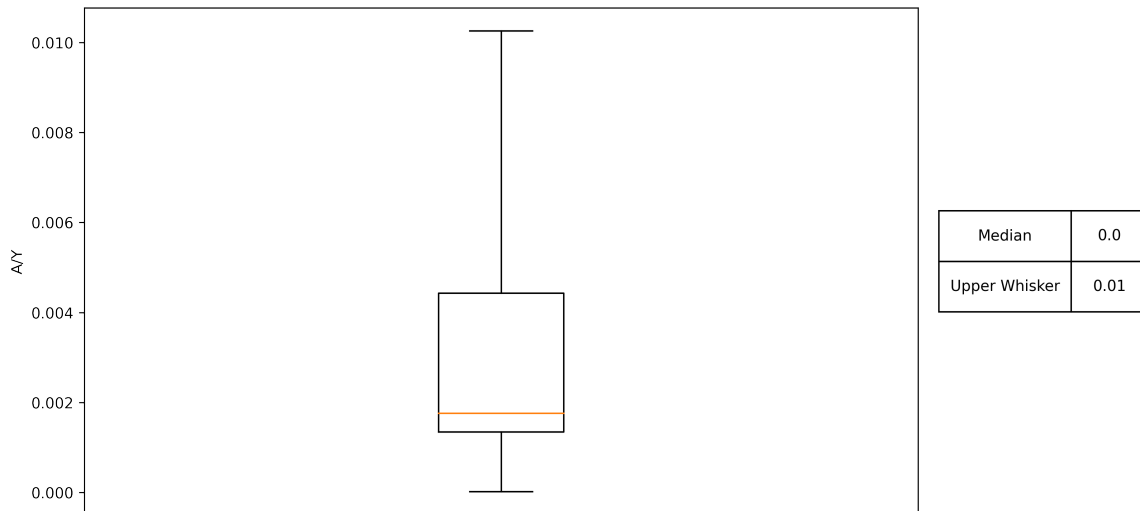
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/Y	7	240.9	0.0	0.0	0.0	0.01	0.01	0

Figure 62-1. Histogram of A/Y for SUDAN GRASS - SILAGE fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot

Figure 62-2. Box and whisker plot of A/Y for SUDAN GRASS - SILAGE fields in the Coalition.



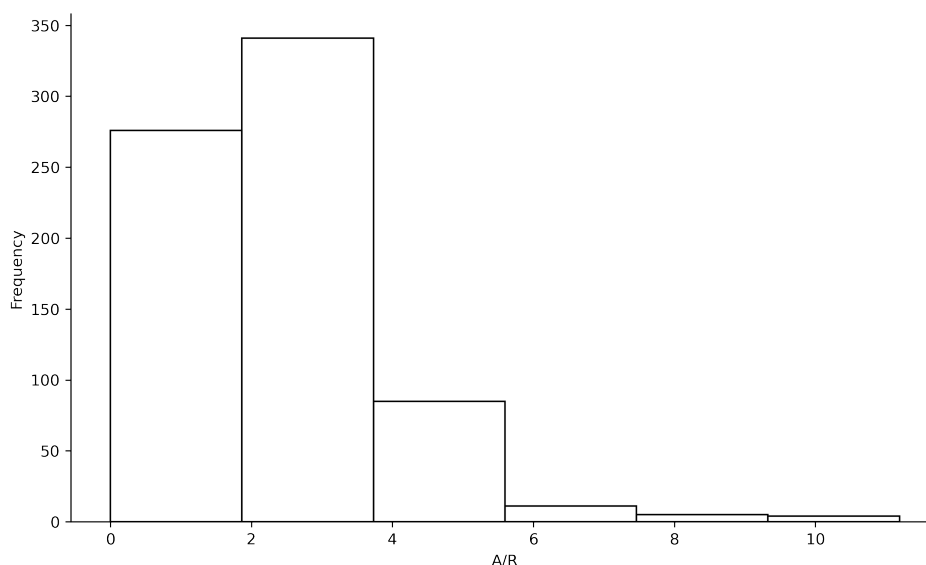
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot
The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

63. SUNFLOWER

Table 63-1. Summary statistics for SUNFLOWER fields in Coalition.

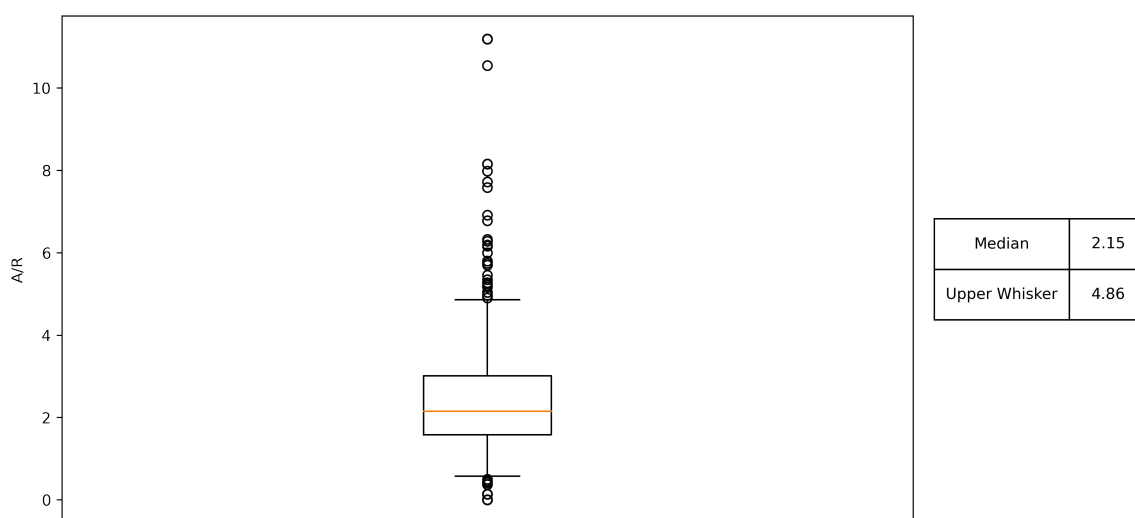
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	724	38632.06	2.49	1.87	0.0	29.51	4.86	33
A-R	724	38632.06	49.58	35.94	-194.8	265.5	109.99	18

Figure 63-1. Histogram of A/R for SUNFLOWER fields in the Coalition.



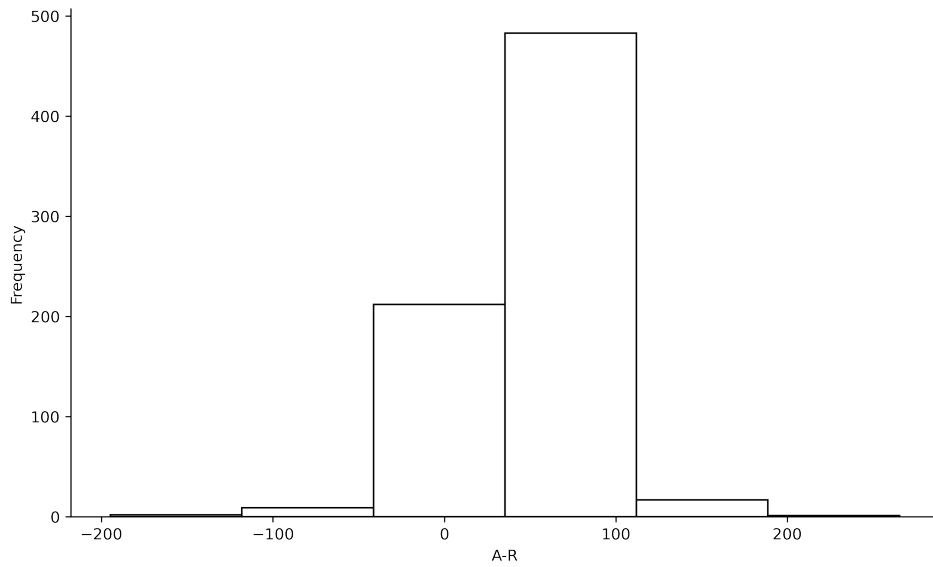
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 63-2. Box and whisker plot of A/R for SUNFLOWER fields in the Coalition.



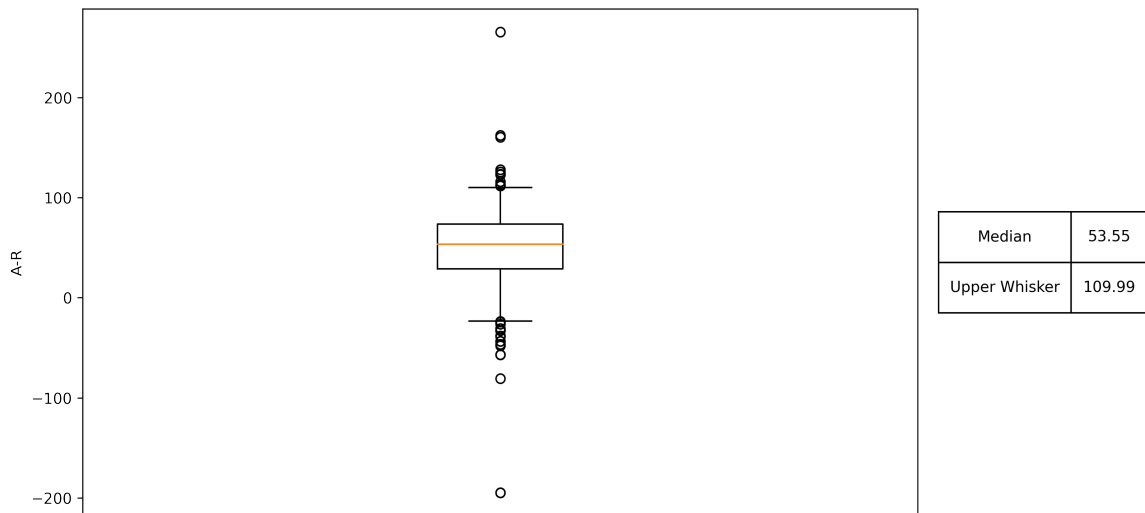
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 63-3. Histogram of A-R for SUNFLOWER fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 63-4. Box and whisker plot of A-R for SUNFLOWER fields in the Coalition.



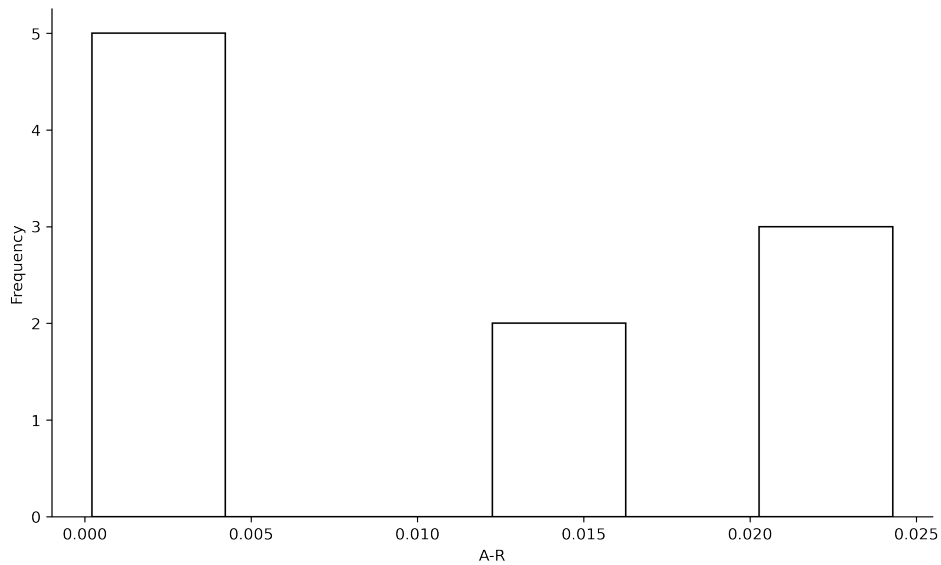
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

64. TOMATO - NR

Table 64-1. Summary statistics for TOMATO - NR fields in Coalition.

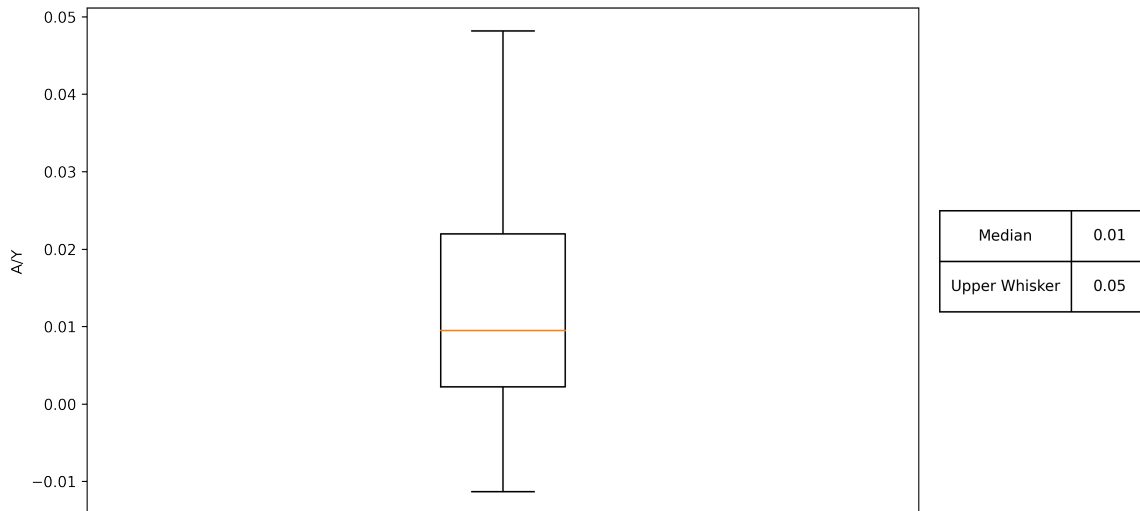
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/Y	10	511.0	0.01	0.01	0.0	0.02	0.05	0

Figure 64-1. Histogram of A/Y for TOMATO - NR fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot

Figure 64-2. Box and whisker plot of A/Y for TOMATO - NR fields in the Coalition.



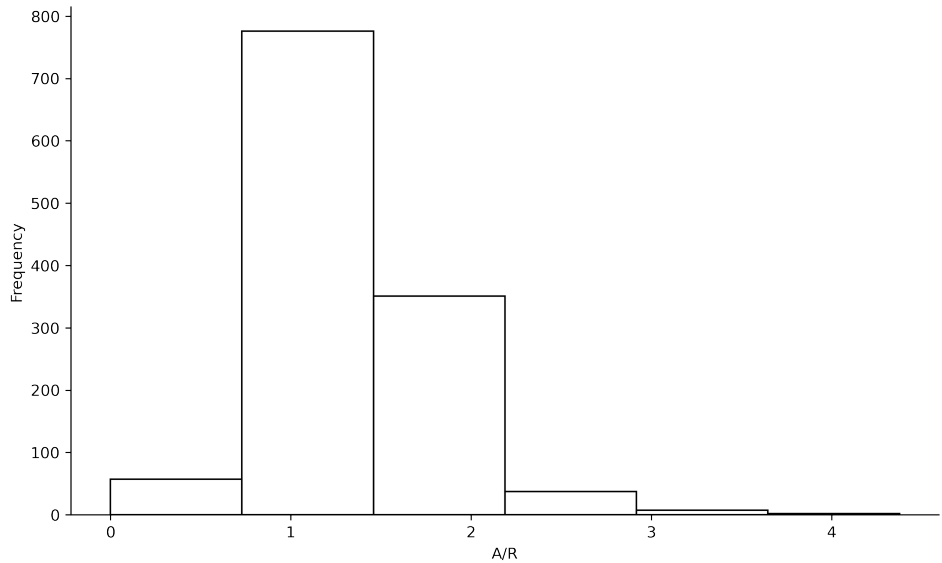
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot
The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

65. TOMATO - PROCESSING

Table 65-1. Summary statistics for TOMATO - PROCESSING fields in Coalition.

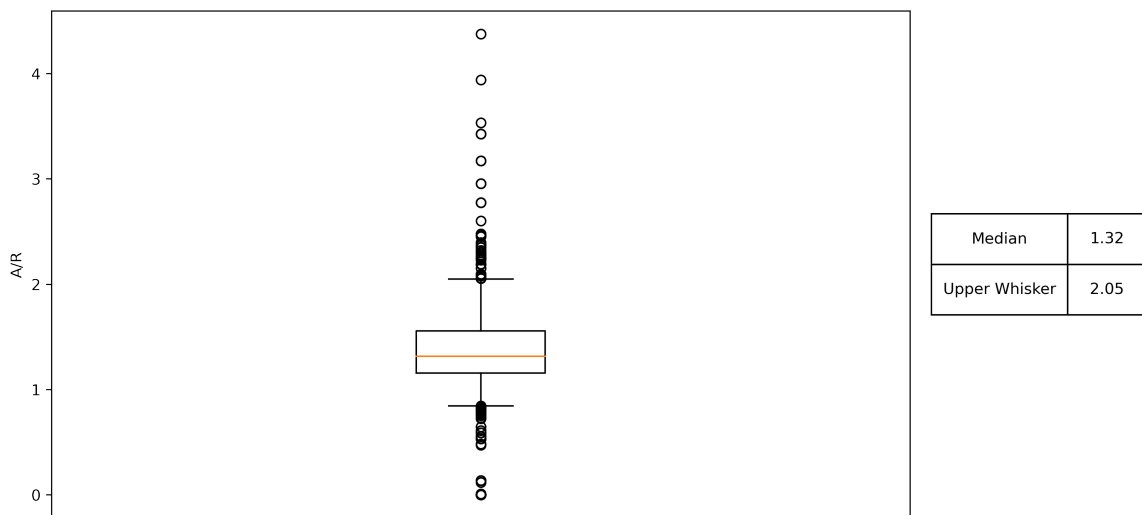
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	1234	63755.71	1.44	1.75	0.0	35.13	2.05	62
A-R	1234	63755.71	49.85	61.81	-169.36	290.49	145.06	68

Figure 65-1. Histogram of A/R for TOMATO - PROCESSING fields in the Coalition.



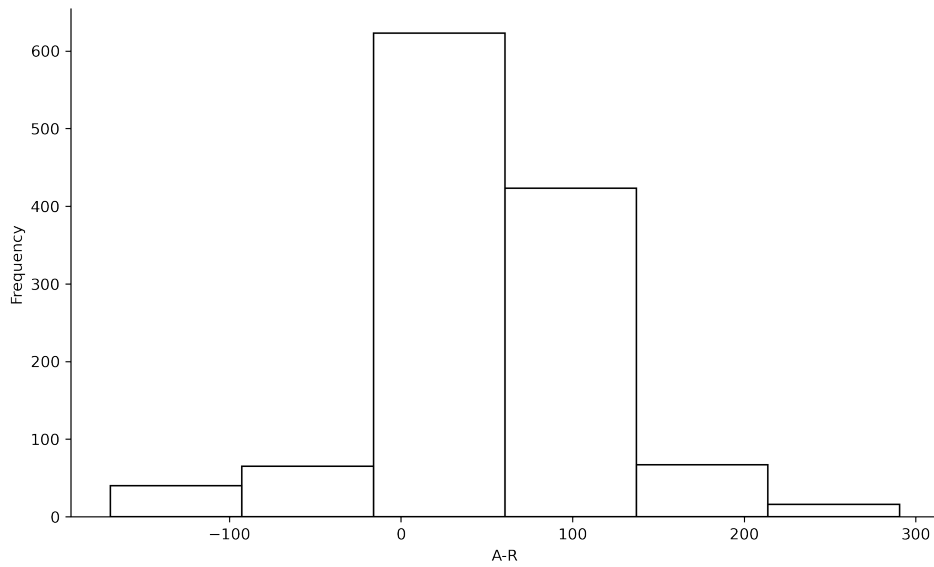
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 65-2. Box and whisker plot of A/R for TOMATO - PROCESSING fields in the Coalition.



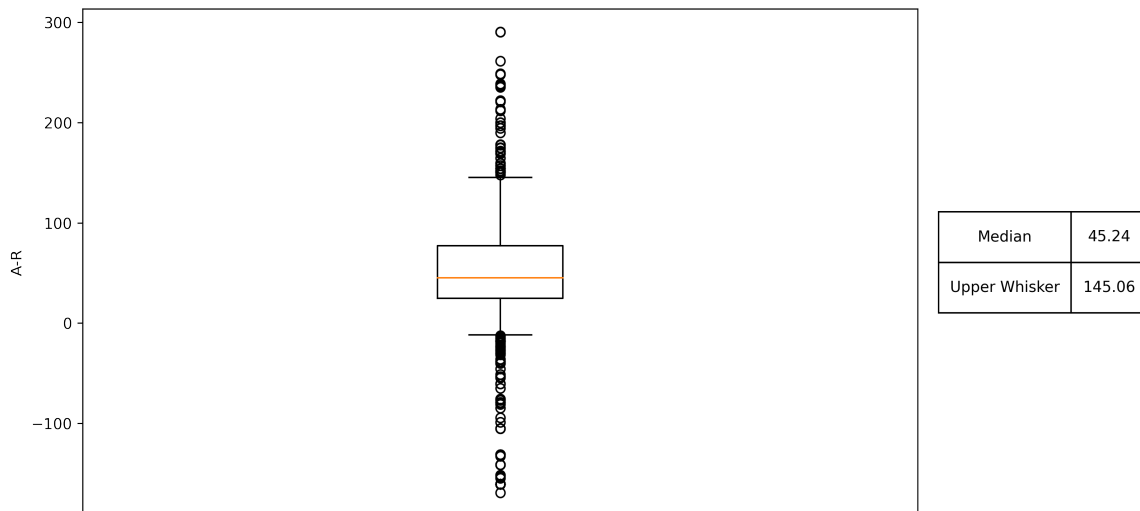
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 65-3. Histogram of A-R for TOMATO - PROCESSING fields in the Coalition.



Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 65-4. Box and whisker plot of A-R for TOMATO - PROCESSING fields in the Coalition.



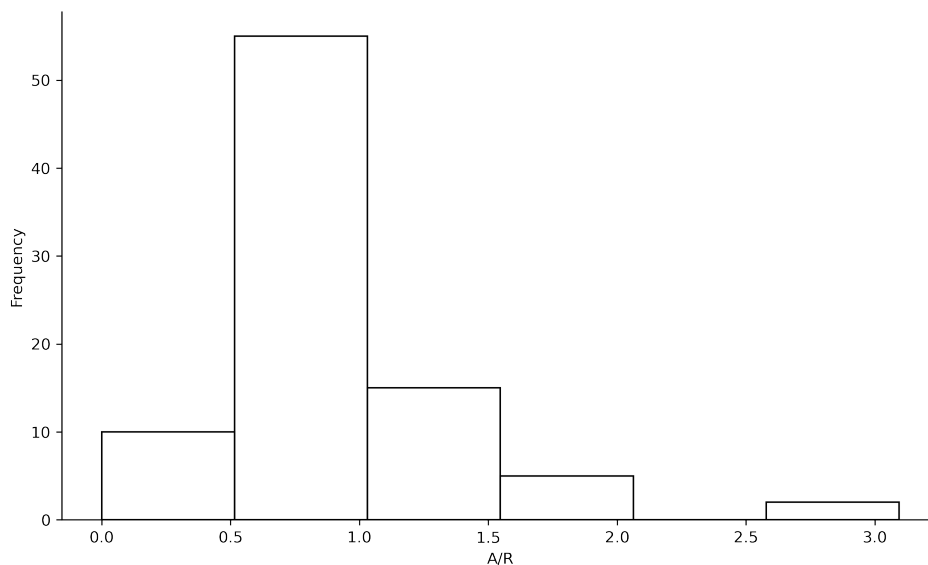
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

66. TRITICALE - GRAIN

Table 66-1. Summary statistics for TRITICALE - GRAIN fields in Coalition.

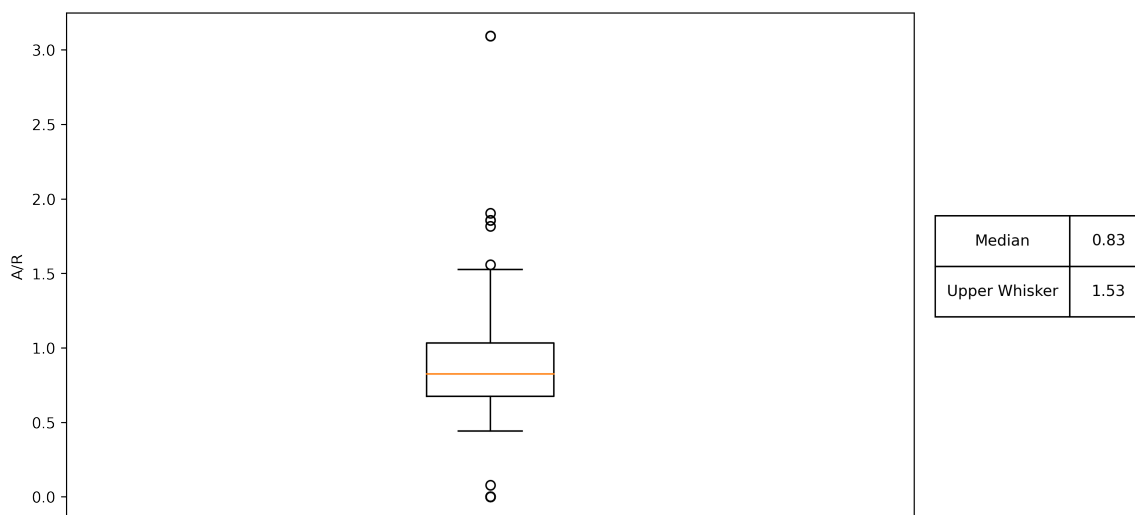
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	87	4285.69	0.88	0.54	0.0	3.09	1.53	7
A-R	87	4285.69	-16.92	38.02	-130.4	84.6	57.23	2

Figure 66-1. Histogram of A/R for TRITICALE - GRAIN fields in the Coalition.



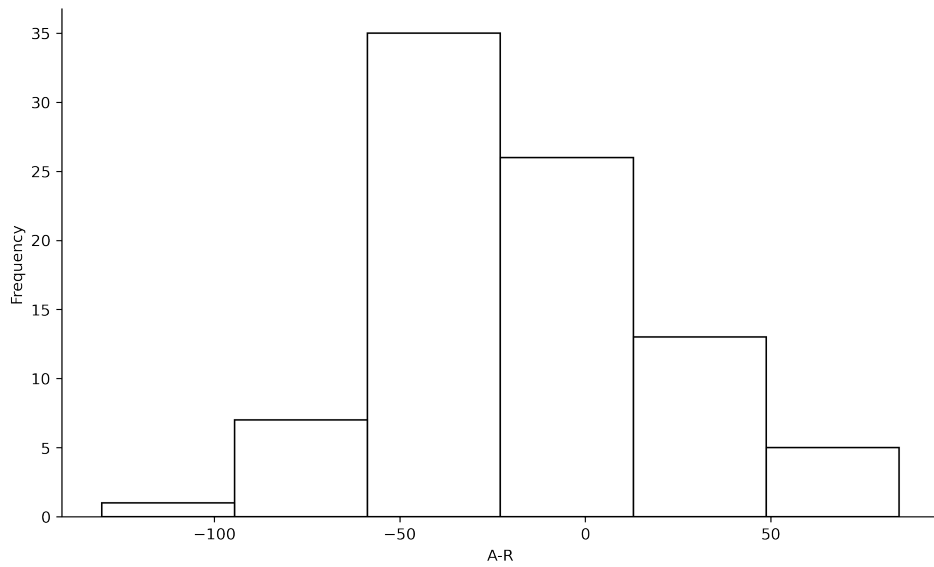
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 66-2. Box and whisker plot of A/R for TRITICALE - GRAIN fields in the Coalition.



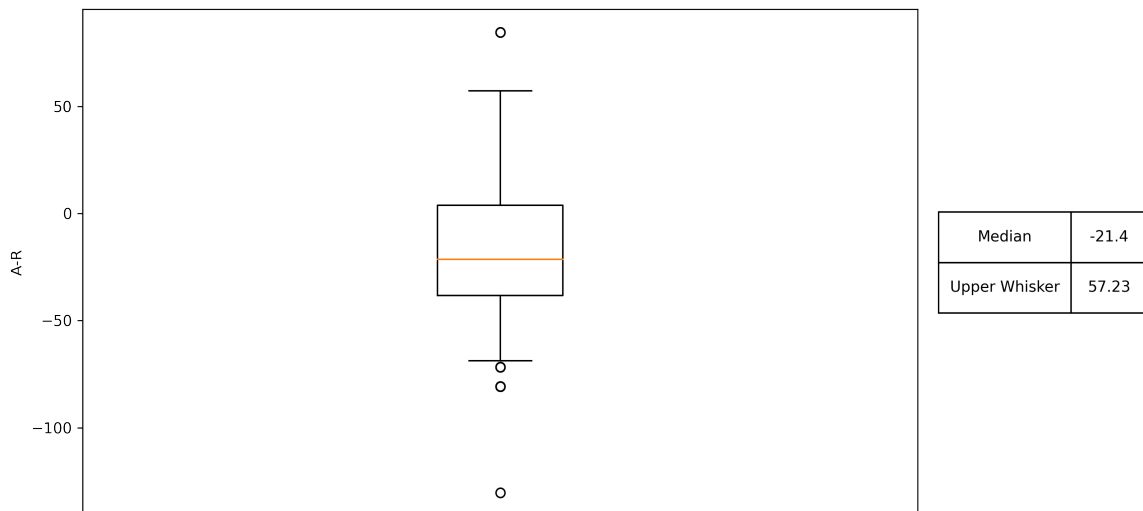
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 66-3. Histogram of A-R for TRITICALE - GRAIN fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 66-4. Box and whisker plot of A-R for TRITICALE - GRAIN fields in the Coalition.



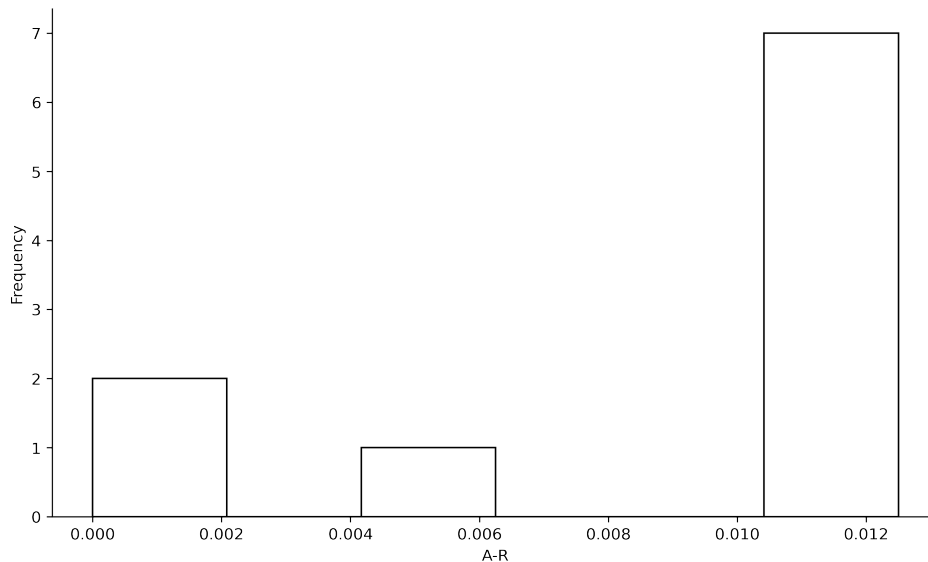
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

67. TRITICALE - HAY

Table 67-1. Summary statistics for TRITICALE - HAY fields in Coalition.

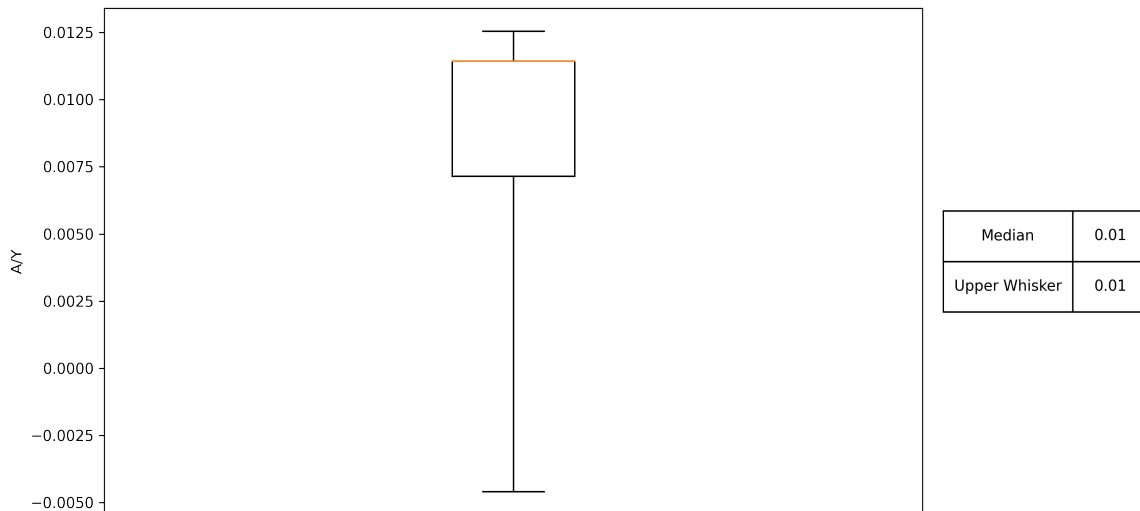
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/Y	10	326.2	0.01	0.01	0.0	0.01	0.01	0

Figure 67-1. Histogram of A/Y for TRITICALE - HAY fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot

Figure 67-2. Box and whisker plot of A/Y for TRITICALE - HAY fields in the Coalition.



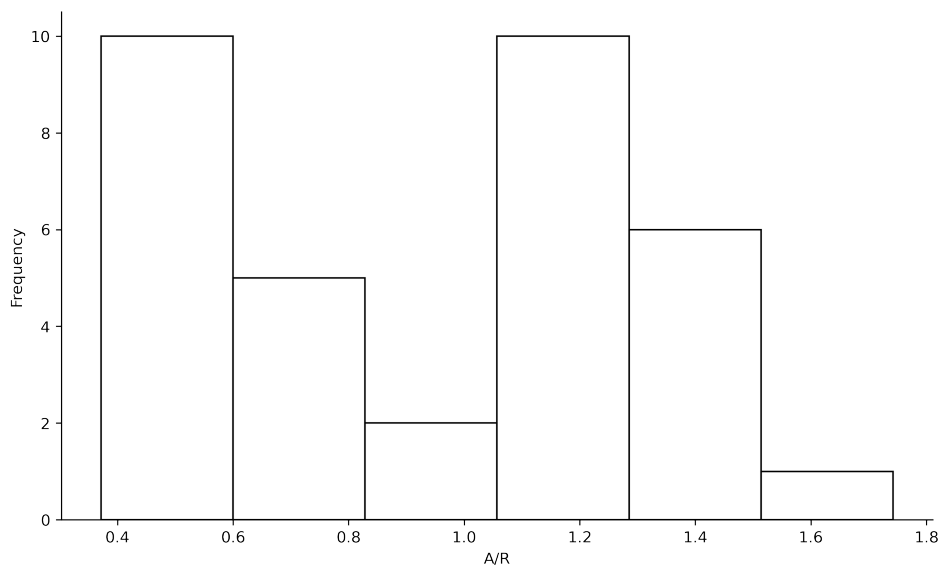
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot
The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

68. TRITICALE - NR

Table 68-1. Summary statistics for TRITICALE - NR fields in Coalition.

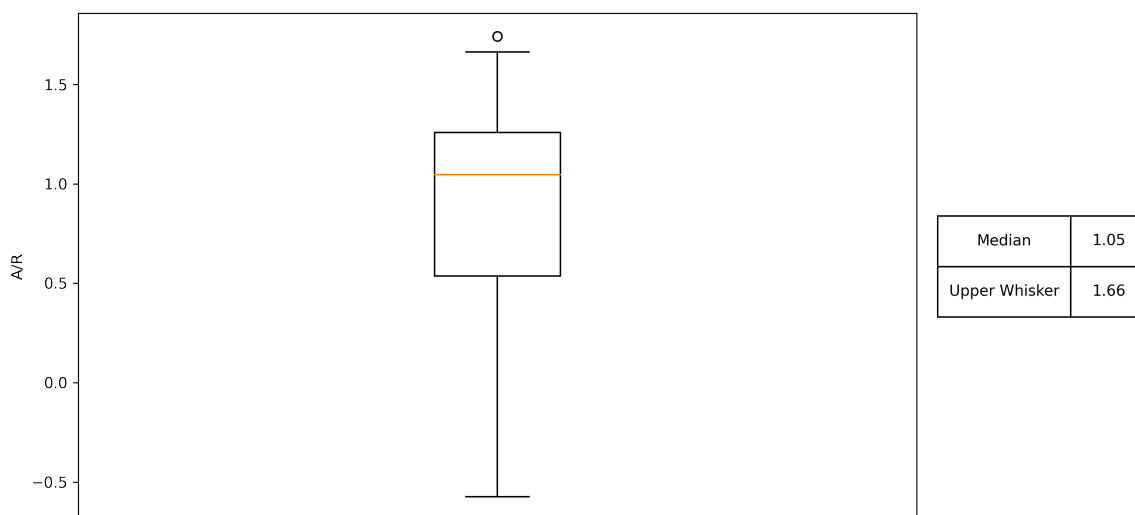
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	34	1592.4	0.93	0.38	0.37	1.74	1.66	1
A-R	34	1592.4	-16.92	60.92	-254.0	61.78	75.6	0

Figure 68-1. Histogram of A/R for TRITICALE - NR fields in the Coalition.



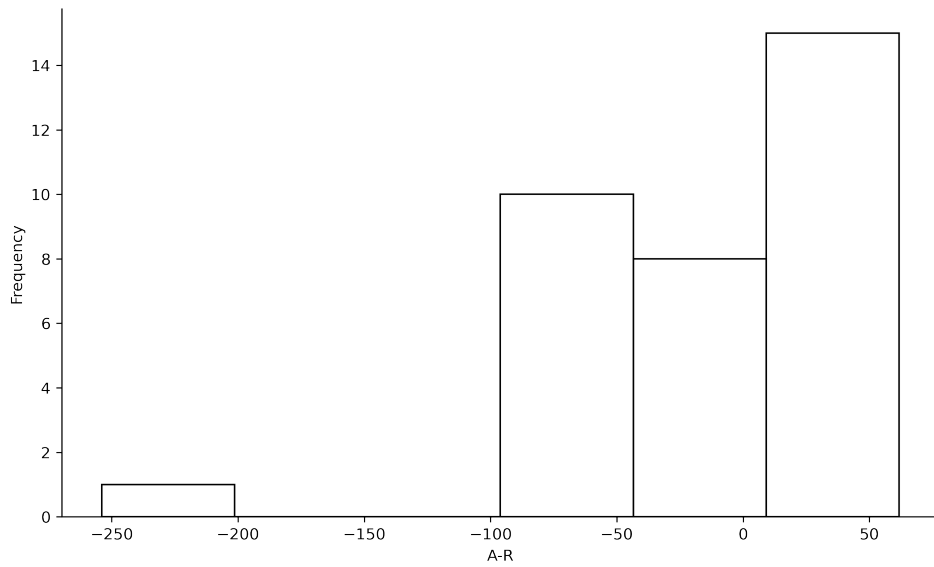
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 68-2. Box and whisker plot of A/R for TRITICALE - NR fields in the Coalition.



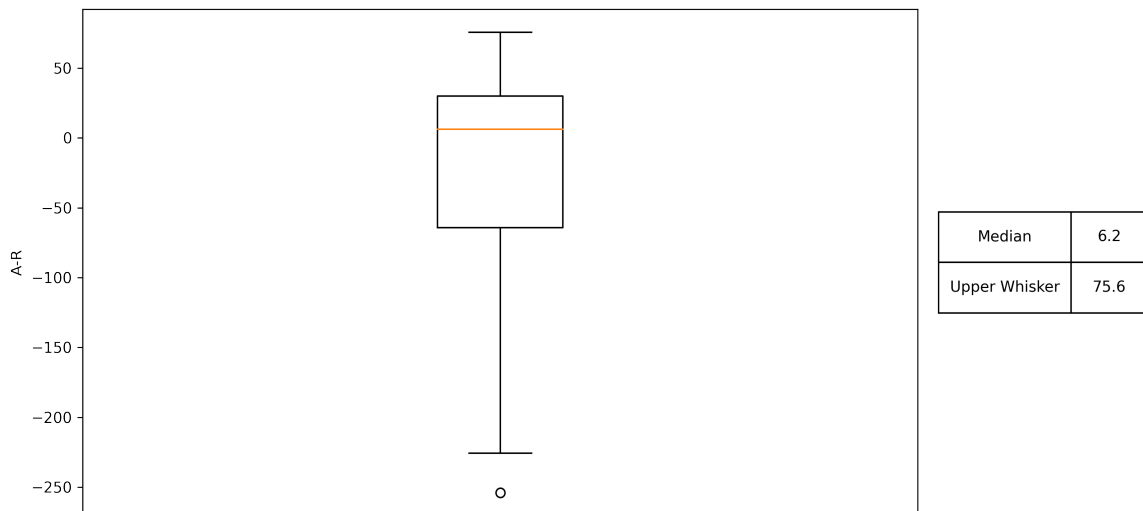
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 68-3. Histogram of A-R for TRITICALE - NR fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 68-4. Box and whisker plot of A-R for TRITICALE - NR fields in the Coalition.



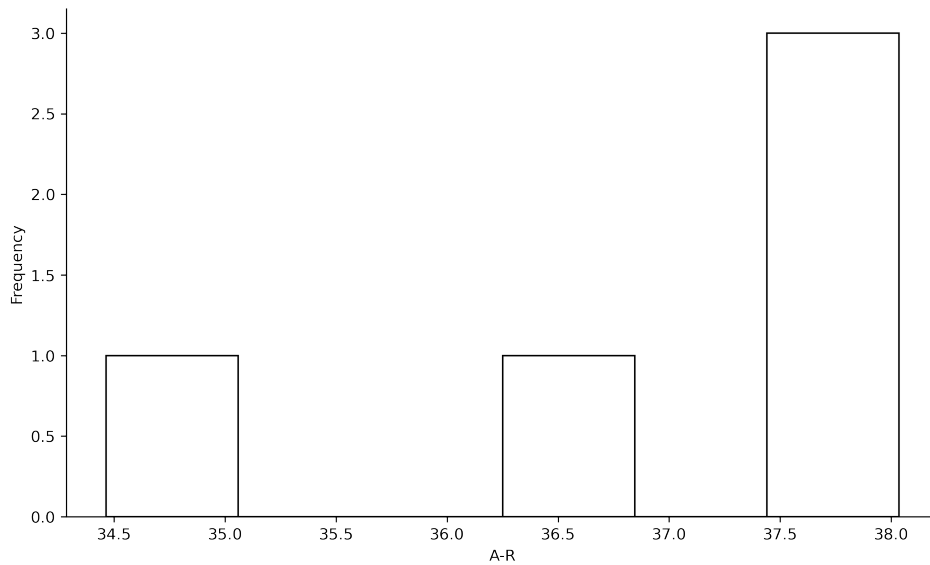
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

69. TURF

Table 69-1. Summary statistics for TURF fields in Coalition.

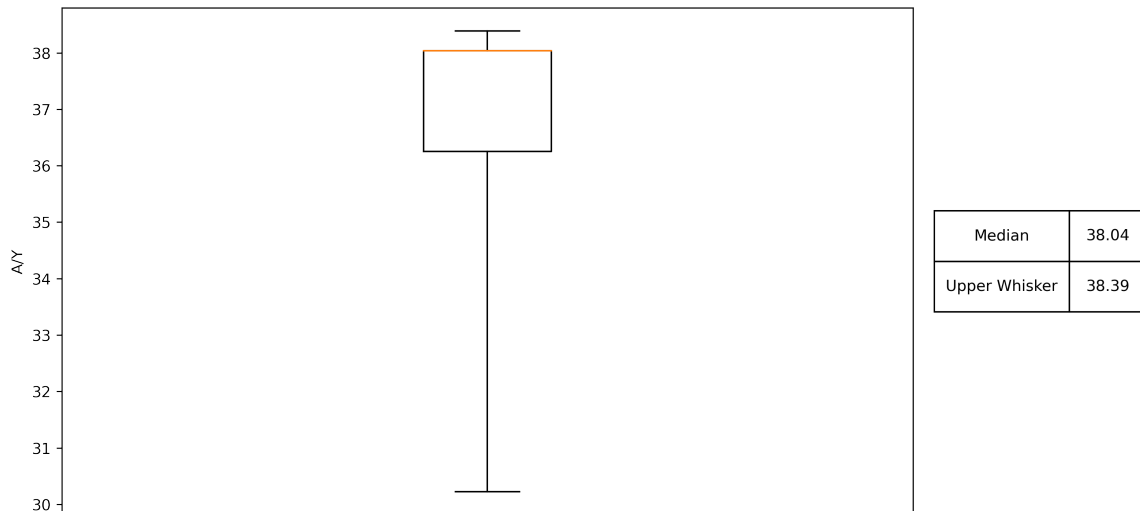
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/Y	7	563.13	36.96	1.6	34.46	38.04	38.39	0

Figure 69-1. Histogram of A/Y for TURF fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot

Figure 69-2. Box and whisker plot of A/Y for TURF fields in the Coalition.



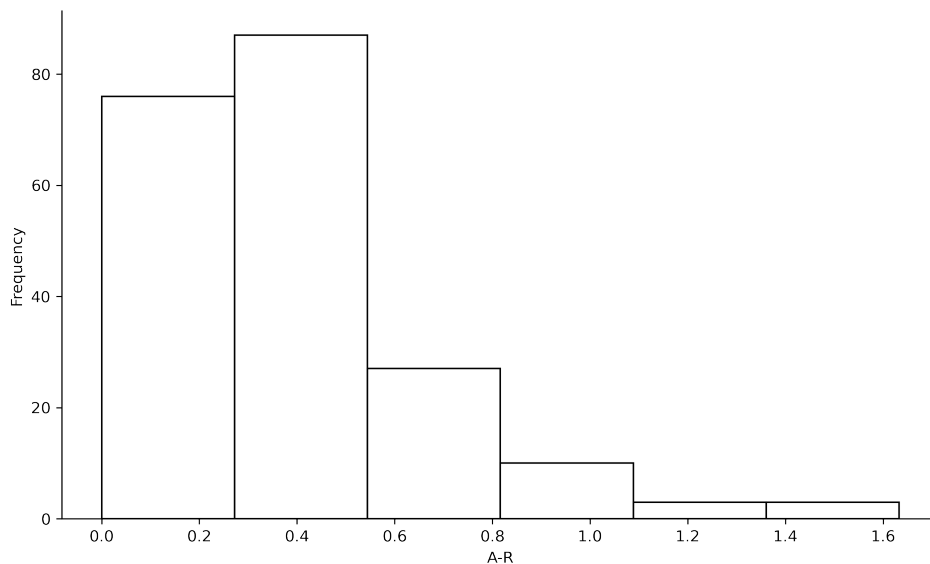
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot
The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

70. VINE SEED

Table 70-1. Summary statistics for VINE SEED fields in Coalition.

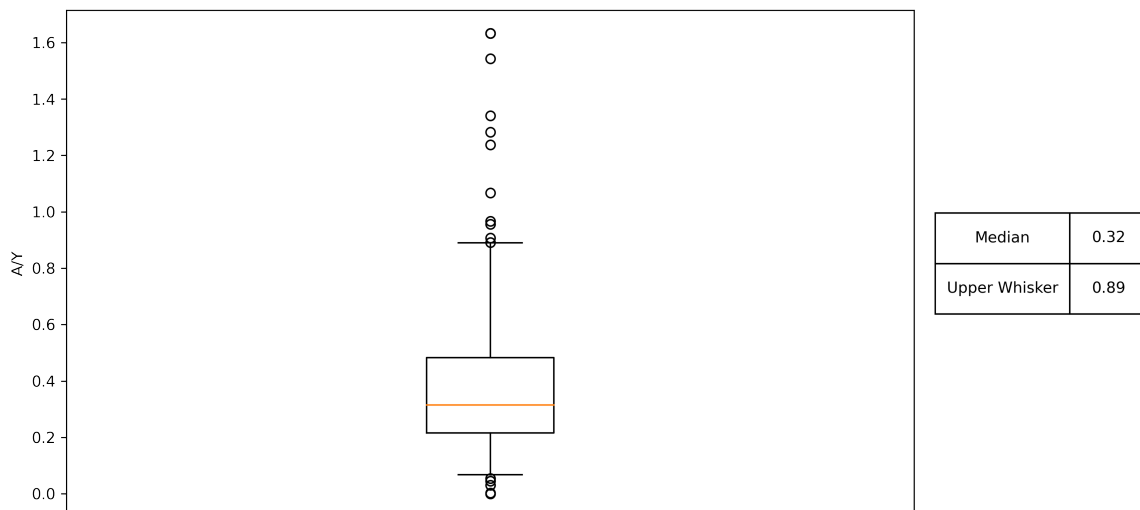
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/Y	209	7022.8	0.44	0.45	0.0	4.0	0.89	14

Figure 70-1. Histogram of A/Y for VINE SEED fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot

Figure 70-2. Box and whisker plot of A/Y for VINE SEED fields in the Coalition.



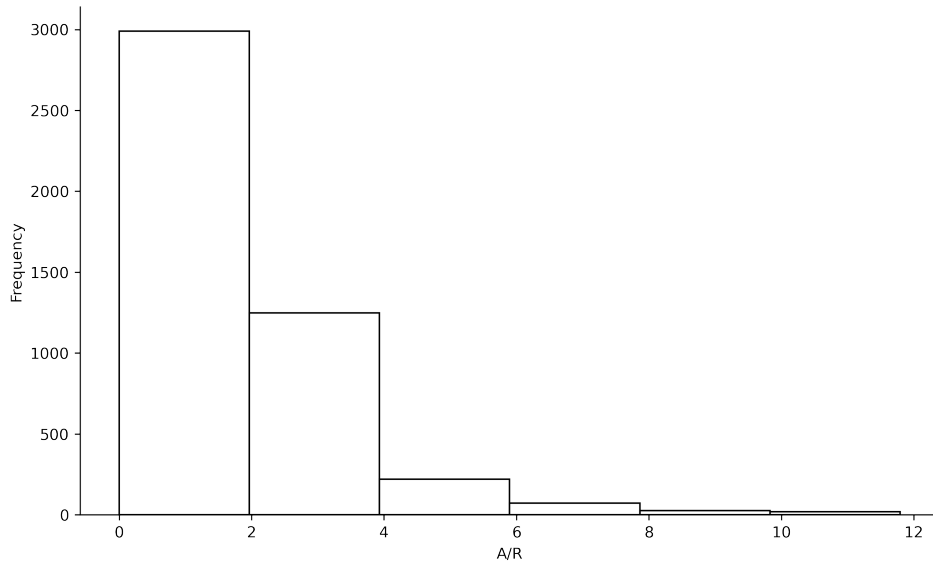
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot
The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

71. WALNUT

Table 71-1. Summary statistics for WALNUT fields in Coalition.

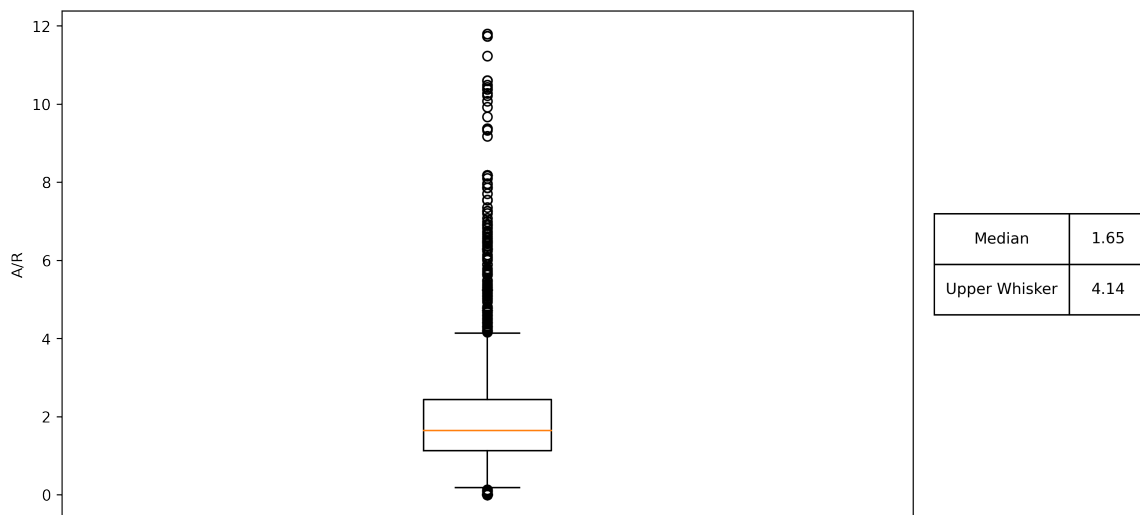
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	4592	173507.64	1.99	1.75	0.0	28.3	4.14	314
A-R	4592	173507.64	48.99	66.4	-174.9	436.4	156.77	211

Figure 71-1. Histogram of A/R for WALNUT fields in the Coalition.



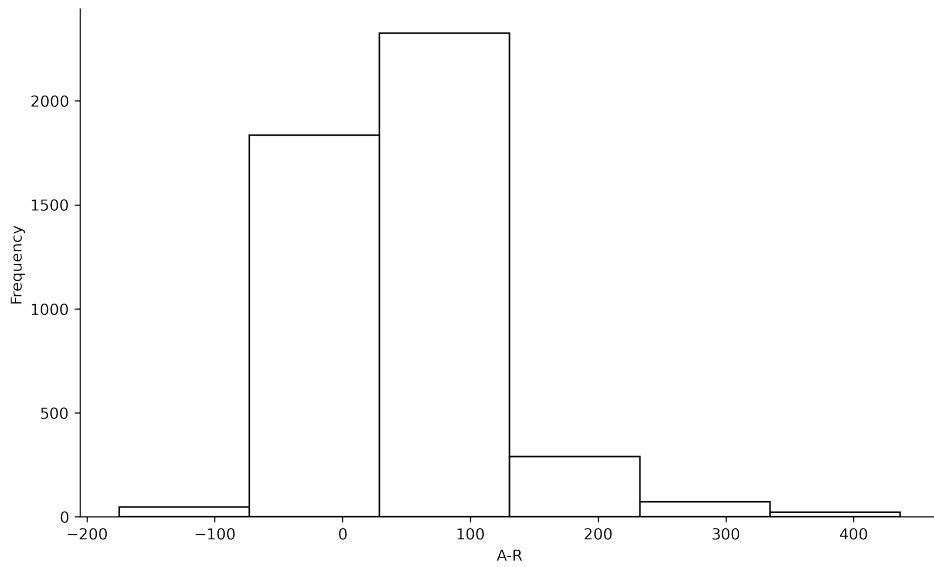
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 71-2. Box and whisker plot of A/R for WALNUT fields in the Coalition.



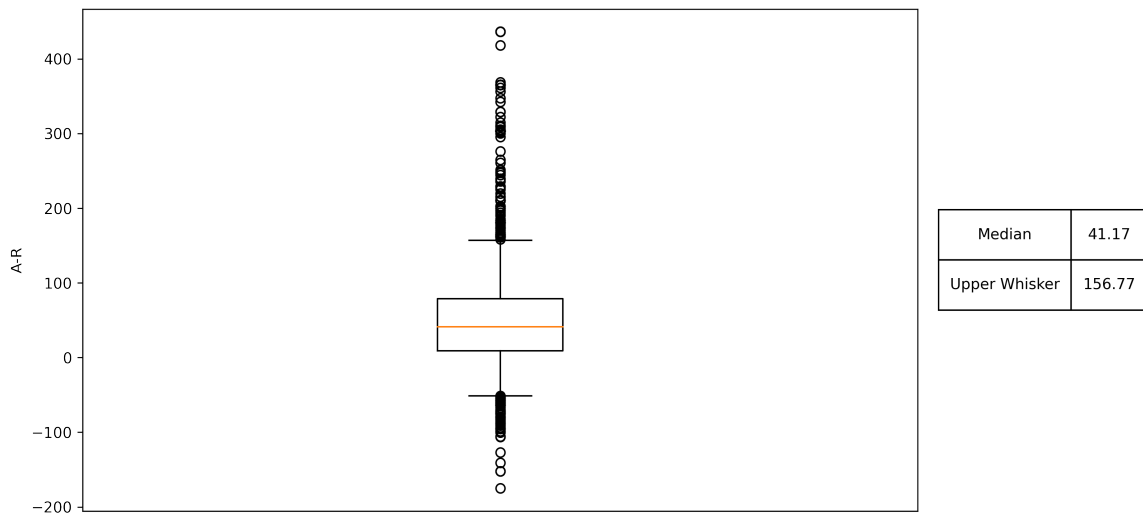
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 71-3. Histogram of A-R for WALNUT fields in the Coalition.



Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 71-4. Box and whisker plot of A-R for WALNUT fields in the Coalition.



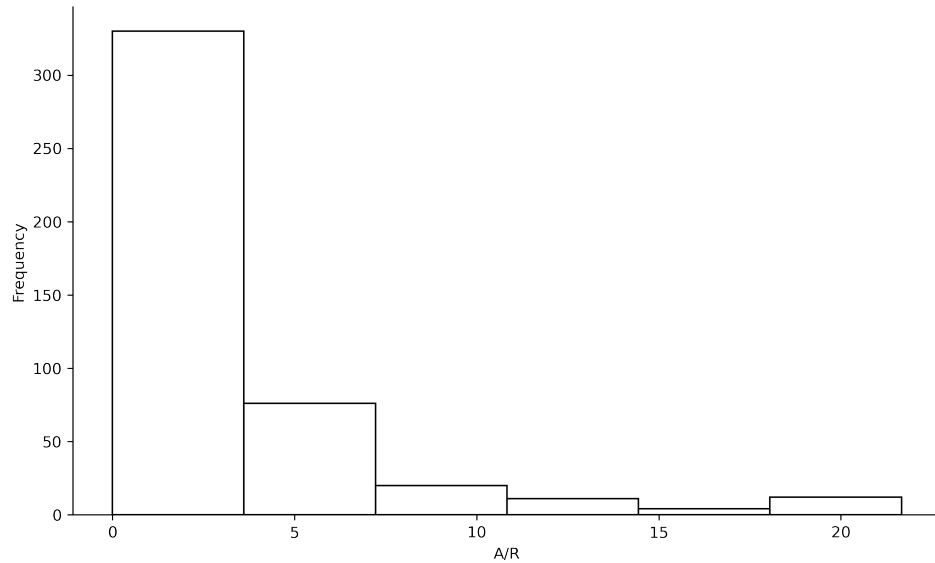
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

72. WALNUT-YOUNG

Table 72-1. Summary statistics for WALNUT-YOUNG fields in Coalition.

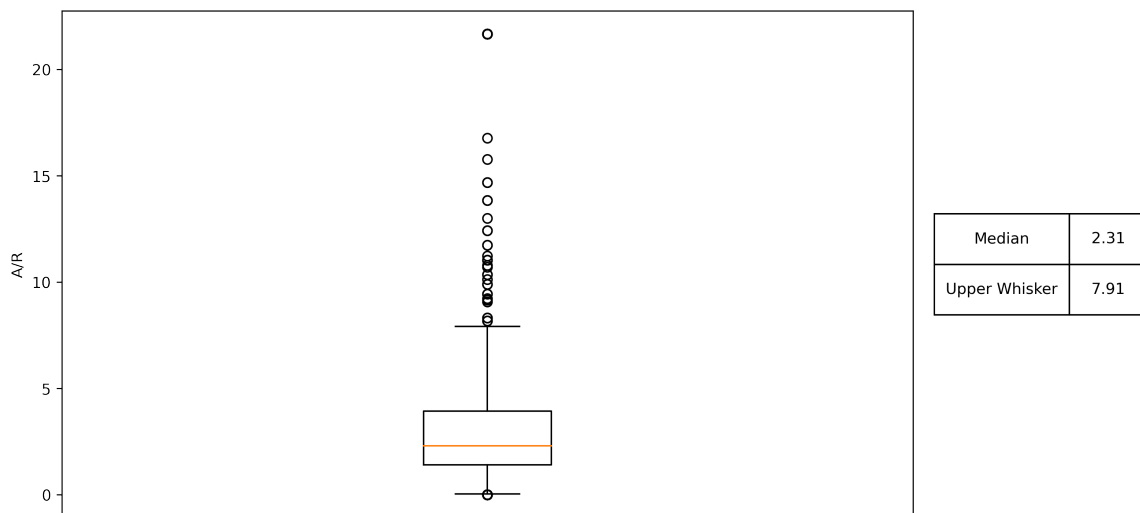
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	453	20598.31	3.63	4.08	0.0	21.66	7.91	--
A-R	453	20598.31	58.21	61.88	-87.45	344.63	169.57	--

Figure 72-1. Histogram of A/R for WALNUT-YOUNG fields in the Coalition.



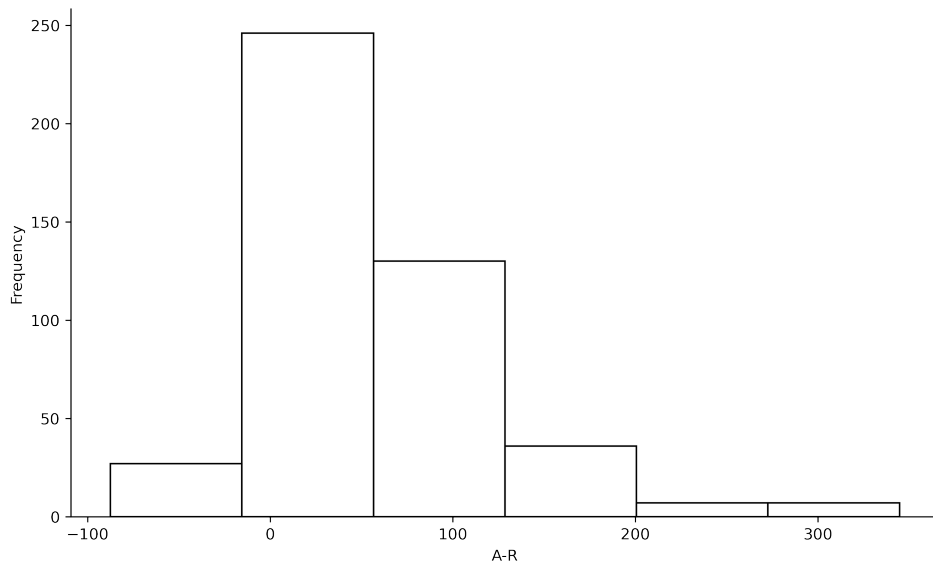
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 72-2. Box and whisker plot of A/R for WALNUT-YOUNG fields in the Coalition.



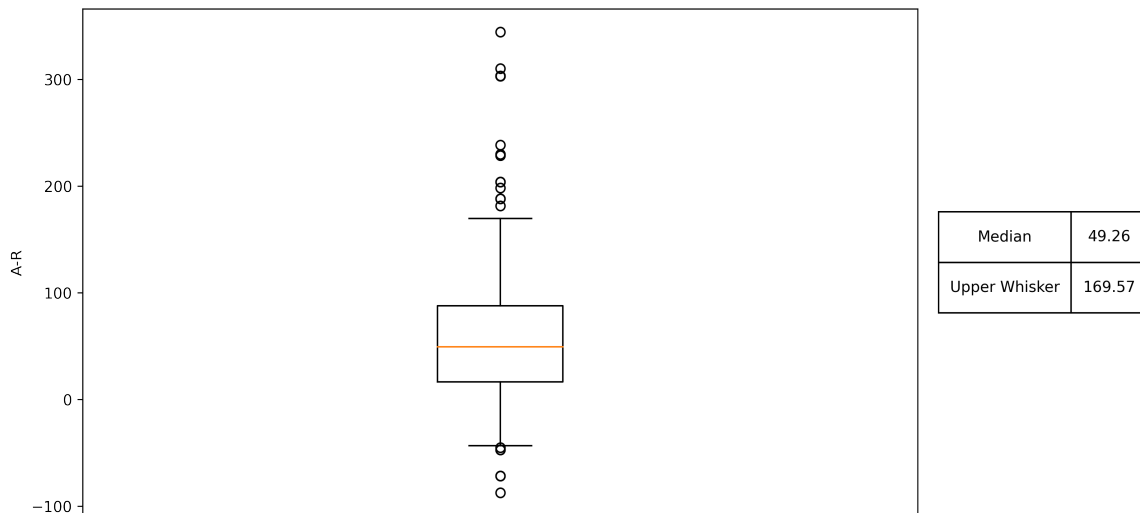
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 72-3. Histogram of A-R for WALNUT-YOUNG fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 72-4. Box and whisker plot of A-R for WALNUT-YOUNG fields in the Coalition.



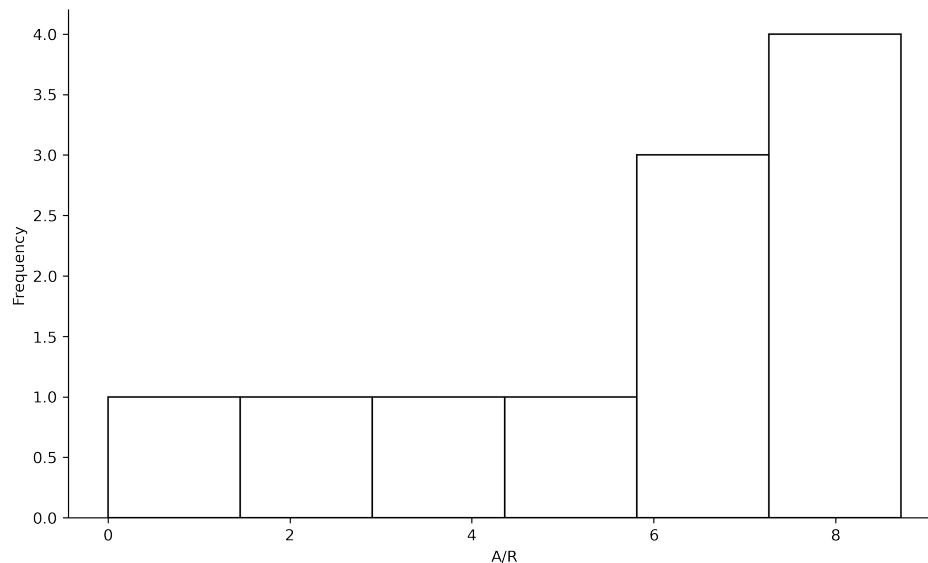
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

73. WATERMELON

Table 73-1. Summary statistics for WATERMELON fields in Coalition.

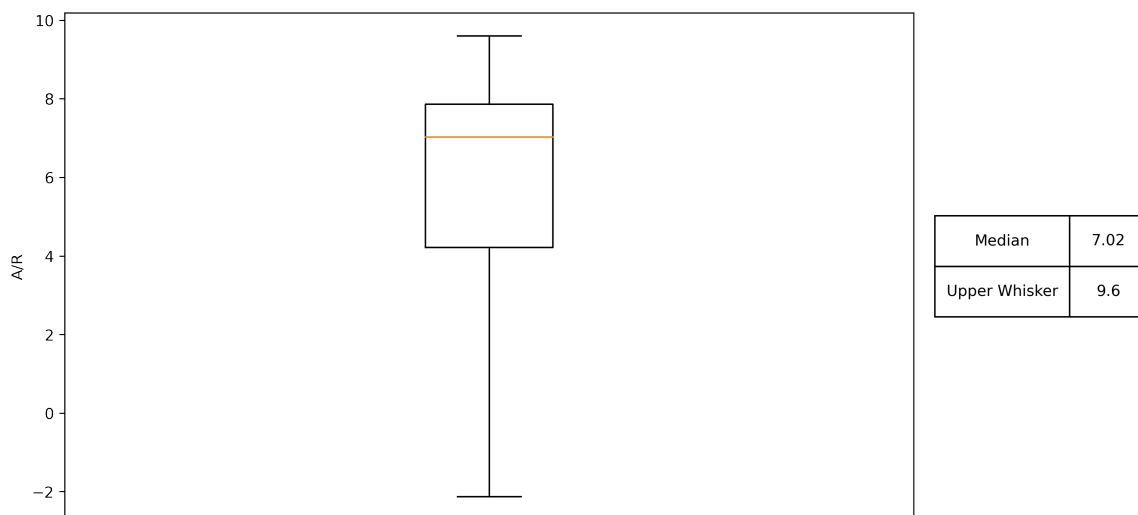
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	11	530.69	5.82	2.85	0.0	8.72	9.6	0
A-R	11	530.69	124.25	75.96	-2.08	240.35	339.18	0

Figure 73-1. Histogram of A/R for WATERMELON fields in the Coalition.



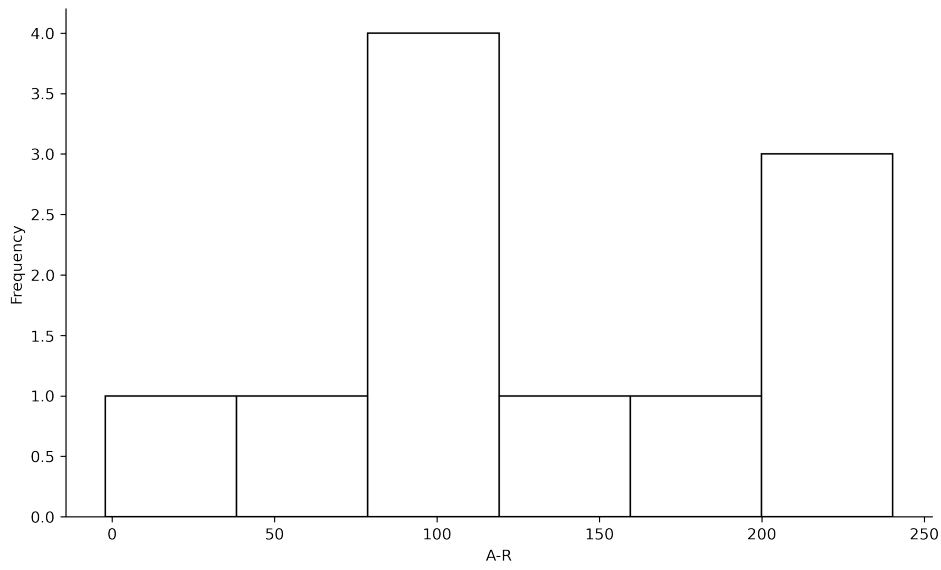
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 73-2. Box and whisker plot of A/R for WATERMELON fields in the Coalition.



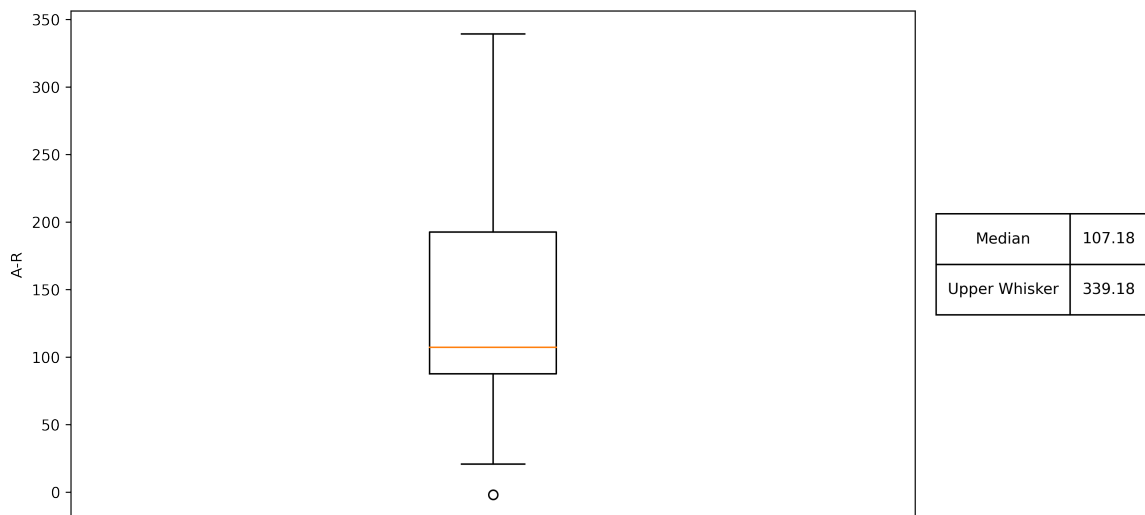
Values $>3x$ the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 73-3. Histogram of A-R for WATERMELON fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 73-4. Box and whisker plot of A-R for WATERMELON fields in the Coalition.



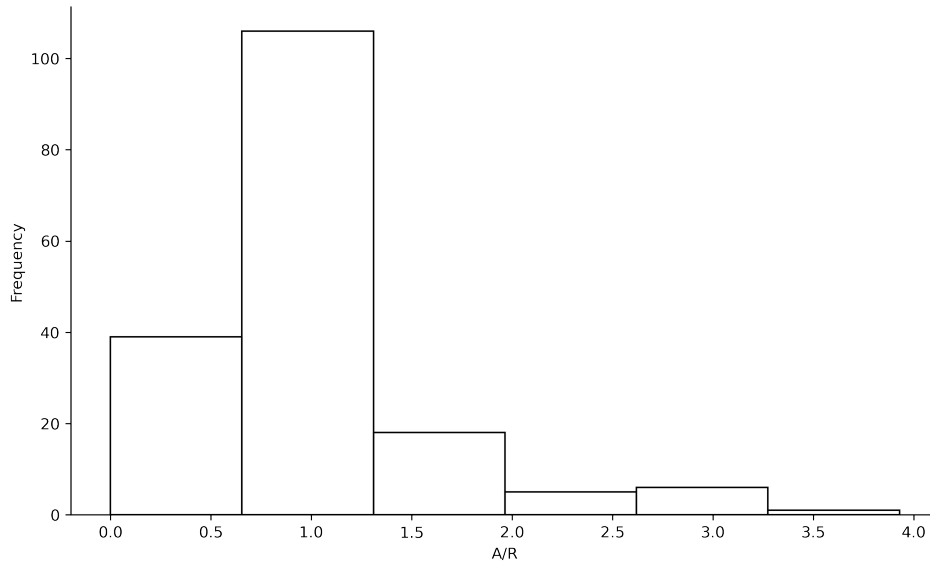
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

74. WHEAT - GRAIN

Table 74-1. Summary statistics for WHEAT - GRAIN fields in Coalition.

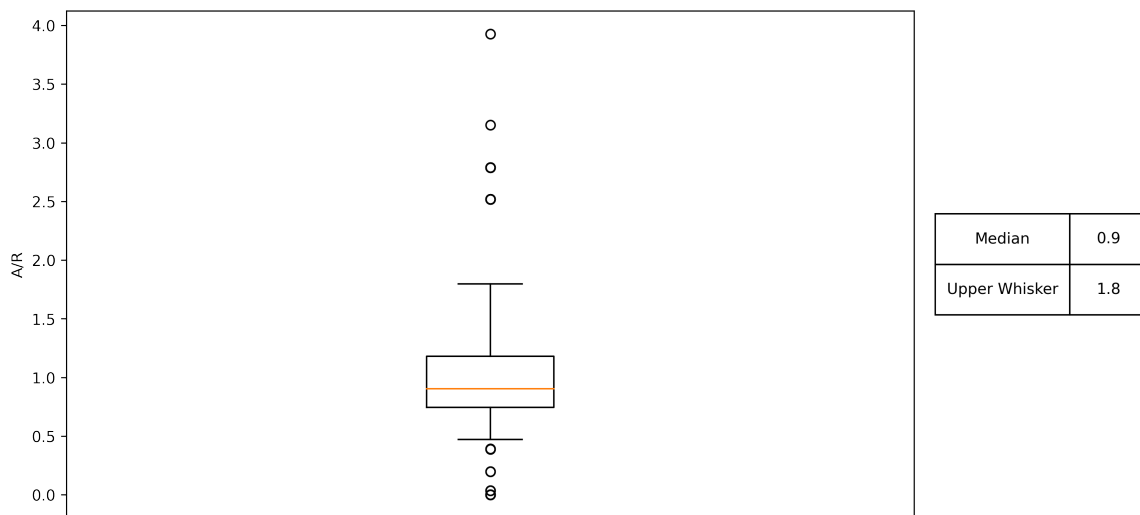
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/R	175	9742.33	1.04	0.61	0.0	3.93	1.8	12
A-R	175	9742.33	-13.15	49.89	-201.55	99.47	89.25	6

Figure 74-1. Histogram of A/R for WHEAT - GRAIN fields in the Coalition.



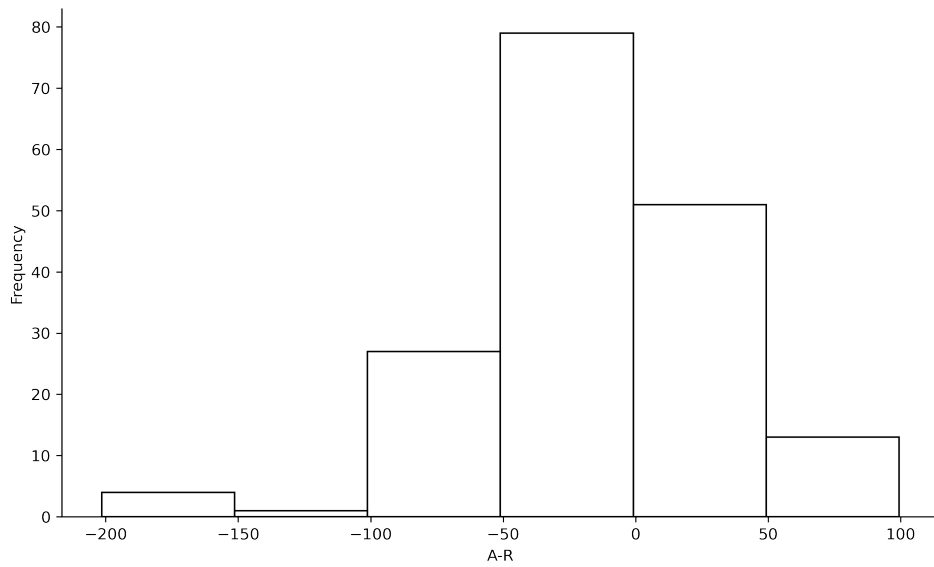
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 74-2. Box and whisker plot of A/R for WHEAT - GRAIN fields in the Coalition.



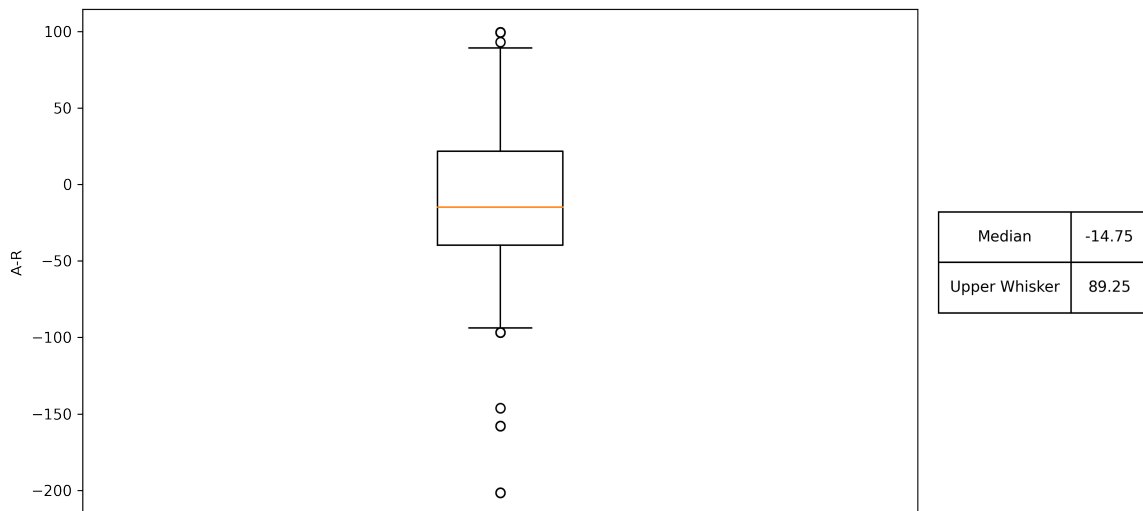
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

Figure 74-3. Histogram of A-R for WHEAT - GRAIN fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot.

Figure 74-4. Box and whisker plot of A-R for WHEAT - GRAIN fields in the Coalition.



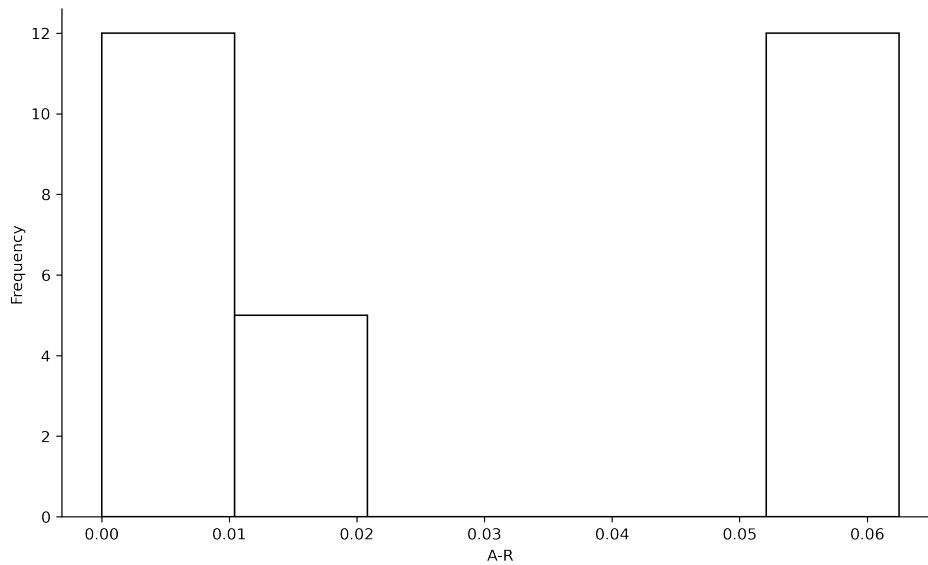
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot. The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

75. WHEAT - HAY

Table 75-1. Summary statistics for WHEAT - HAY fields in Coalition.

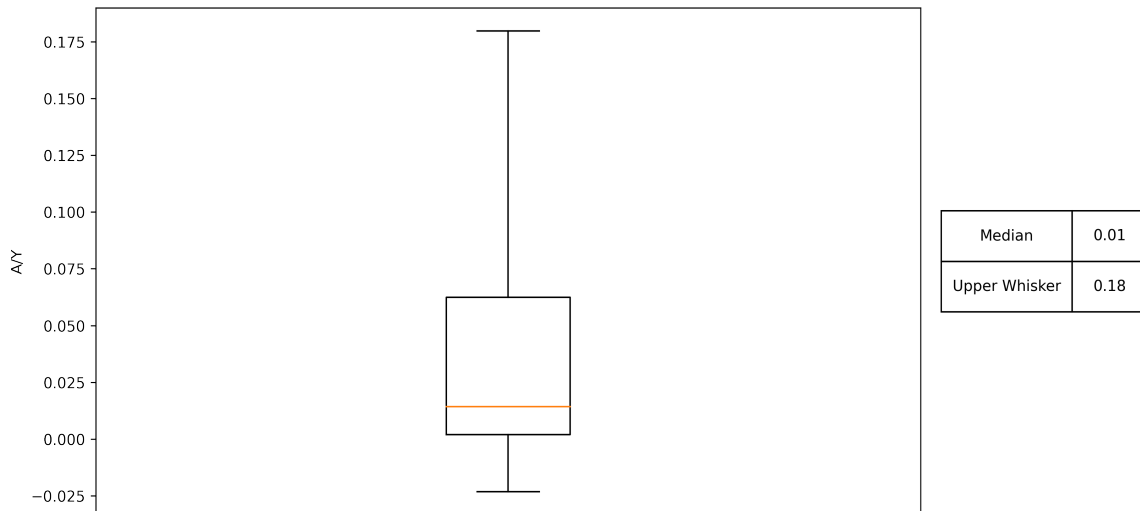
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/Y	29	3014.43	0.03	0.03	0.0	0.06	0.18	0

Figure 75-1. Histogram of A/Y for WHEAT - HAY fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot

Figure 75-2. Box and whisker plot of A/Y for WHEAT - HAY fields in the Coalition.



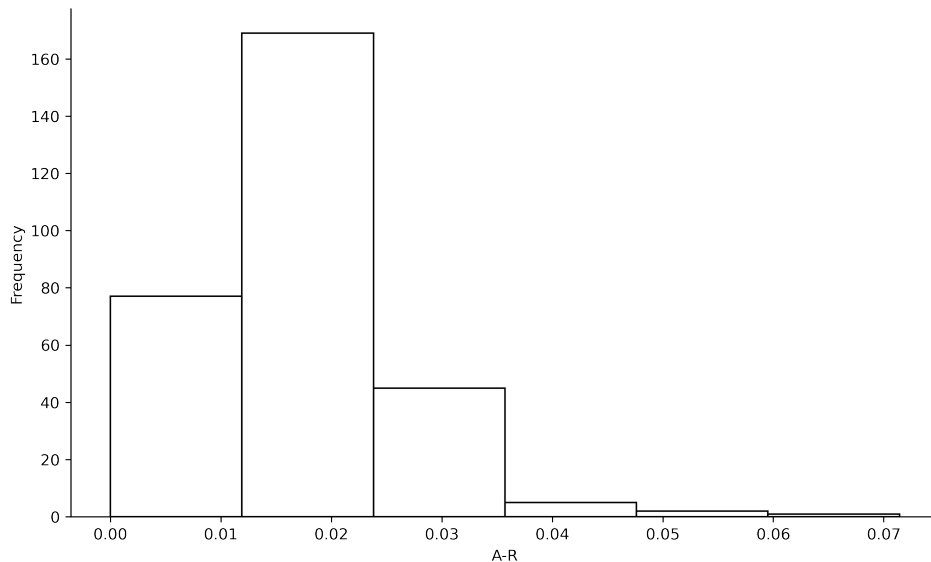
Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot
The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

76. WHEAT - NR

Table 76-1. Summary statistics for WHEAT - NR fields in Coalition.

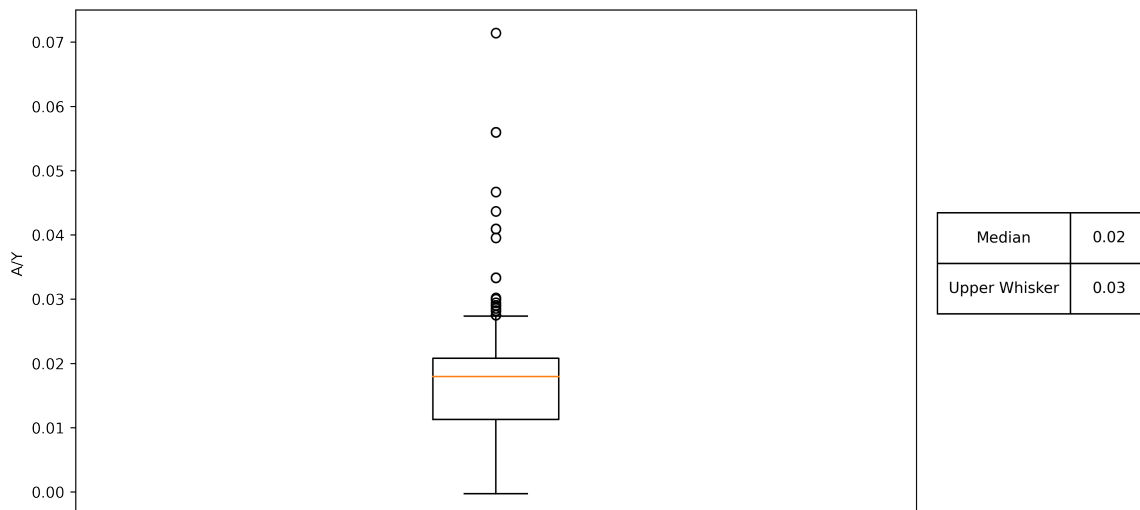
Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max	Outlier Threshold	No. Outliers
A/Y	302	15375.14	0.02	0.02	0.0	0.24	0.03	28

Figure 76-1. Histogram of A/Y for WHEAT - NR fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot

Figure 76-2. Box and whisker plot of A/Y for WHEAT - NR fields in the Coalition.



Values >3x the difference between the upper and lower whisker not shown to avoid skewing of plot
The whiskers are the medcouple values with the upper whisker being the outlier threshold. Dots are outliers.

77. OTHER CROPS

Table 77-1. Summary statistics for crops with limited representation in the Coalition

For crops with less than four unique values, no summary statistics could be calculated.

Crop	Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max
ALFALFA - GREENCHOP	A/Y	1	48.0	0.02		0.02	0.02
ALFALFA - SILAGE/HAYLAGE	A/R	5	150.4	0.2	0.42	0.0	0.95
	A-R	5	150.4	-115.84	75.58	-192.0	-4.8
BEAN - GREEN	A/R	9	582.99	4.74	4.2	0.0	15.41
	A-R	9	582.99	59.91	25.57	-7.51	78.5
CABBAGE	A/Y	2	11.26	0.02	0.0	0.02	0.02
CHRISTMAS TREE	A/Y	19	136.25	0.0	0.0	0.0	0.0
CILANTRO	A/Y	1	87.9	0.02		0.02	0.02
CITRUS-YOUNG	A/R	3	17.25	35.58	20.37	19.32	58.42
	A-R	3	17.25	93.3	29.02	75.86	126.79
CORN - POPCORN	A/Y	11	526.2	0.04	0.0	0.04	0.04
COVER CROP	A/Y	5	7.0	0.0	0.0	0.0	0.0
EGGPLANT	A/Y	2	1.34	0.0	0.0	0.0	0.0
FLOWER/ORNAMENTAL	A/Y	6	340.96				
GARLIC	A/R	5	331.8	1.87	0.41	1.42	2.17
	A-R	5	331.8	88.28	40.15	44.3	117.6
GRAPE - OTHER	A/Y	10	179.0	0.0	0.0	0.0	0.01
GRAPE - TABLE	A/R	3	13.25	13.27	11.71	0.0	22.12
	A-R	3	13.25	42.22	49.65	-2.78	95.48
HEMP	A/Y	4	20.25	0.03	0.05	0.0	0.1
HERB/SPICE	A/Y	1	14.4	0.0		0.0	0.0
HOPS	A/Y	3	19.35	0.29	0.26	0.0	0.48
KIWI-YOUNG	A/Y	3	619.71	0.06	0.08	0.01	0.16
LAVENDER	A/Y	2	3.0	0.0	0.0	0.0	0.0
MILLET - NR	A/Y	2	176.0	0.02	0.0	0.02	0.03
MINT	A/Y	3	282.0	2.96	0.84	1.99	3.45
MISC FIELD CROPS	A/Y	7	245.0	0.01	0.03	0.0	0.09
MISC FRUIT TREE	A/Y	129	2609.63	0.03	0.1	0.0	1.08
MISC NUT TREE	A/Y	8	123.05	0.05	0.0	0.04	0.05
MISC ROW CROP	A/Y	48	3283.13	0.25	0.35	0.0	2.0
MISC VEGETABLE	A/Y	78	1474.52	0.02	0.11	0.0	1.0
NURSERY	A/Y	10	80.95	0.02	0.0	0.02	0.02

Crop	Parameter	# Fields	Acreage	Mean	St. Dev.	Min	Max
OAT - NR	A/Y	3	125.0	0.0	0.0	0.0	0.0
OAT - SILAGE	A/Y	3	76.9	0.0	0.0	0.0	0.0
OKRA	A/Y	2	102.9	0.08	0.02	0.07	0.1
ONION	A/R	2	84.2	0.32	0.45	0.0	0.63
	A-R	2	84.2	-11.32	4.36	-14.4	-8.23
OTHER	A/Y	11	216.98	1.23	3.58	0.0	12.0
PLUM/PLUOT-YOUNG	A/R	4	52.5	82.6	55.07	0.0	110.13
	A-R	4	52.5	277.79	187.61	-3.63	371.6
POMEGRANATE	A/R	1	20.0	0.0		0.0	0.0
	A-R	1	20.0	-23.76		-23.76	-23.76
POTATO	A/R	6	364.67	0.06	0.0	0.06	0.06
	A-R	6	364.67	-84.16	0.0	-84.16	-84.16
RESEARCH	A/Y	2	70.5	0.14	0.2	0.0	0.28
RYEGRASS - SILAGE/HAYLAGE	A/Y	3	65.6	0.0	0.0	0.0	0.01
TOMATO - FRESH MARKET	A/R	3	58.0	5.39	3.93	0.86	7.66
	A-R	3	58.0	49.07	56.88	-9.29	104.34
TURNIP	A/Y	1	8.2	0.01		0.01	0.01
VETCH	A/Y	5	130.1	0.0	0.0	0.0	0.0
WHEAT - GREENCHOP	A/Y	1	99.29	0.09		0.09	0.09
WHEAT - SILAGE	A/R	2	97.2	0.15	0.07	0.1	0.2
	A-R	2	97.2	-152.0	82.02	-210.0	-94.0
WINTER GRAIN	A/Y	6	117.9	0.02	0.03	0.0	0.06
WINTER VEGETABLE	A/Y	1	0.09	0.02		0.02	0.02

APPENDIX B

EXAMPLE INMP MEMBER FEEDBACK REPORT

**Sacramento Valley Water Quality Coalition
2020 Irrigation and Nitrogen Management Plan Summary Report Results**

Owner ID: ABC1000
Reporter ID: ABC1000

Owner Name: John Doe
Reporter Name: John Doe

Crop: CORN - GRAIN

These results represent information you provided on your 2020 Irrigation and Nitrogen Management Plan Summary Report comparing your Nitrogen *Applied* to your Nitrogen *Removed* (A/R and A – R) to other fields of the same crop in the Sacramento Valley Water Quality Coalition.

The table below shows your results and the average results for the whole Coalition for fields of the same crop:

- Columns 1 & 2:** Your Applied pounds of Nitrogen per acre compared to the average pounds of Nitrogen Applied per acre in the Coalition for your crop.
- Columns 3, 4, 5:** Your Nitrogen *Applied* divided by Nitrogen *Removed* (A/R) compared to the average A/R in the Coalition and the A/R outlier threshold.
- Columns 6, 7:** Your Nitrogen *Applied* minus Nitrogen *Removed* (A – R) compared to the average A – R in the Coalition.
- Column 8:** The total number of fields analyzed in the Coalition for your crop.

Table 1. Your Results Compared to the Coalition (Sacramento Valley)

APN	# Irrigated Acres	Crop Yield (lb/ac)	(1) N Applied (lb/ac)	(2) Coalition Median N Applied (lb/ac)	(3) A/R ¹	(4) Coalition Median A/R	(5) A/R Outlier Threshold	(6) A–R	(7) Coalition Median A–R	(8) # of Fields in Coalition
000-000-000-001	77	9,000	290	222	2.69	1.53	2.23	182	77.6	454
000-000-000-002	60	10,000	148	222	1.23	1.53	2.23	28	77.6	454

A/R Status Color Key

- Outlier in Coalition²
 High in Coalition (>75% of fields)
 Average or Low in Coalition (<75% of fields)
 Not Enough Data

The A/R status color shows how your fields compare to others of the same crop across the whole Coalition. If your A/R values are greater than the outlier threshold for the Coalition, that is considered to be an “outlier” value. If your value is less than this threshold but greater than 75% of all fields in the Coalition of the same crop, it is considered high. If your value is less than 75% of all fields in the Coalition for your crop, then it is average or low. In some cases, there were not enough data points to calculate outliers. N/A means the value could not be calculated or the crop was excluded from outlier calculations (e.g., young orchards or no R factor for crop).

Members with outliers for A/R must have their INMP certified by an irrigation and nitrogen management plan specialist unless the Member receives additional self-certification training provided by the third-party.

Notes:

1. A/R Value: The purpose of this value is to estimate the amount of residual Nitrogen available to leach to groundwater. The A/R value (total Applied N divided by N Removed), was calculated using published N removal values from: *Nitrogen concentrations in harvested plant parts - A literature overview* (Geisseler, 2016) (http://geisseler.ucdavis.edu/Geisseler_Report_2016_12_02.pdf). This publication documents the best available information, but values are expected to be updated and modified as new information becomes available. For many crops, the publication indicates only few if any values could be found, while for others extensive datasets were

available.

2. Outlier fields have an A/R value that is greater than the outlier threshold. The outlier threshold is generally the 75th percentile plus 1.5 x the distance between the 25th and 75th percentiles. This distance is called the interquartile range and is used to measure how spread out the results are. Some modifications to the calculation are made if the data distribution for a crop is skewed following the procedure of Hubert and Vandervieren (2008).

APPENDIX C

INMP STATISTICAL GROUPINGS AND EXCLUSION THRESHOLDS BY CROP

Specific Crop	Statistical Crop Grouping	Maximum Yield (lbs/ac)	Minimum Yield (lbs/ac)	R Conversion Factor (lbs N/lbs yield)	Crop Exempt from INMP Reporting
ALFALFA	ALFALFA - NR	30,000		0.03115	
ALFALFA - SEED	SEED CROP	3,000			
ALFALFA - HAY	ALFALFA - HAY	30,000	1,000	0.03115	
ALFALFA - SILAGE/HAYLAGE	ALFALFA - SILAGE/HAYLAGE	50,000		0.012	
ALFALFA - GREENCHOP	ALFALFA - GREENCHOP	50,000			
ALMOND	ALMOND	10,000	100	0.068	
APPLE	APPLE	70,000	500	0.00054	
APRICOT/APRIUM	APRICOT/APRIUM	70,000	500	0.00278	
AQUACULTURE	AQUACULTURE				Y
ASPARAGUS	ASPARAGUS	10,000	200	0.002925	
BARLEY - NON-IRRIGATED	NON-IRRIGATED CROP	50,000			Y
BARLEY	BARLEY - NR	50,000	500	0.0168	
BARLEY - FODDER/SILAGE	BARLEY - FODDER/SILAGE	50,000	500		
BARLEY - GRAIN	BARLEY - GRAIN	20,000	500	0.0168	
BARLEY - GREENCHOP	BARLEY - GREENCHOP	50,000	500		
BARLEY - SILAGE	BARLEY - SILAGE	50,000	500		
BARLEY - HAY	BARLEY - HAY	50,000	500		
BEAN - GREEN	BEAN - GREEN	50,000		0.00289	
BEAN - LIMA	BEAN DRY	10,000	100	0.03615	
BEAN - GARBANZO	BEAN DRY	10,000	100	0.0336	
BEAN - BLACKEYE	BEAN DRY	10,000	100	0.0365	
BEAN DRY	BEAN DRY	10,000	100	0.035416667	
BEET	BEET	75,000			
BERRY	BERRY	50,000			
BLACKBERRY	BERRY	50,000			
BLUEBERRY	BERRY	50,000			
BROCCOLI	BROCCOLI	50,000		0.0056	
BROCCOLI - SEED	SEED CROP	3,000			
CABBAGE - SEED	SEED CROP	3,000			
CABBAGE	CABBAGE	50,000			
CANOLA	CANOLA	10,000			
CARROT	CARROT	100,000		0.0014	
CHERRY	CHERRY	30,000	300	0.00221	
CHESTNUT	CHESTNUT	30,000			
CHRISTMAS TREE	CHRISTMAS TREE				
CILANTRO	CILANTRO	50,000			
CITRUS	CITRUS	70,000	300	0.00138	
CORN	CORN - NR	100,000			
CORN - FODDER/SILAGE	CORN - FODDER/SILAGE	100,000	500	0.003765	
CORN - GRAIN	CORN - GRAIN	20,000	500	0.012	
CORN - POPCORN	CORN - POPCORN	20,000			

Note:

Yield thresholds estimated from a variety of sources including CDFA production statistics, UCCE cost studies and literature, and previous years INMP data

Specific Crop	Statistical Crop Grouping	Maximum Yield (lbs/ac)	Minimum Yield (lbs/ac)	R Conversion Factor (lbs N/lbs yield)	Crop Exempt from INMP Reporting
CORN - SWEET	CORN - SWEET	50,000	300	0.003585	
COTTON	COTTON	10,000	500	0.0217	
COVER CROP	COVER CROP				
CUCUMBER	CUCUMBER	120,000		0.00108	
CUCUMBER - SEED	VINE SEED	3,000			
DICHONDRA	DICHONDRA				
EGGPLANT	EGGPLANT	50,000			
FALLOW	FALLOW	0			Y
FESCUE	HAY/FORAGE	50,000	100	0.0254	
FIG	FIG	50,000	100	0.00127	
FILBERT/HAZELNUT	FILBERT/HAZELNUT	10,000			
FLOWER/ORNAMENTAL	FLOWER/ORNAMENTAL				
FORAGE/HAY	HAY/FORAGE	50,000		0.0267	
GARLIC	GARLIC	50,000		0.00755	
GRAIN HAY	GRAIN HAY	50,000		0.01085	
GRAPE - OTHER	GRAPE - OTHER				
GRAPE - TABLE	GRAPE - TABLE	70,000	100	0.00113	
GRAPE - WINE	GRAPE - WINE	40,000	100	0.0018	
GRAPE ROOTSTOCK	GRAPE ROOTSTOCK				
GRASS HAY	HAY/FORAGE	50,000	100	0.0267	
GREENHOUSE	GREENHOUSE				
HAY/FORAGE	HAY/FORAGE	50,000	100	0.0267	
HEMP	HEMP				
HERB/SPICE	HERB/SPICE				
HOPS	HOPS				
KALE	KALE	50,000			
KIWI	KIWI	50,000			
KOHLRABI	KOHLRABI	50,000			
LAVENDER	LAVENDER				
LEEK	LEEK	75,000			
LETTUCE	LETTUCE	50,000			
MELON	MELON	100,000		0.001535	
MELON - SEED	VINE SEED	3,000			
MELON - HONEYDEW	MELON	100,000		0.001475	
MELON - CANTALOUPE	MELON	100,000		0.002435	
MILLET	MILLET - NR	50,000			
MILLET - GREENCHOP	MILLET - GREENCHOP	50,000			
MILLET - SILAGE	MILLET - SILAGE	50,000			
MILLET - HAY	MILLET - HAY	50,000			
MILLET - GRAIN	MILLET - GRAIN	50,000			
MILO/SORGHUM	SORGHUM/MILO - NR	70,000	500	0.0165	

Note:

Yield thresholds estimated from a variety of sources including CDFA production statistics, UCCE cost studies and literature, and previous years INMP data

Specific Crop	Statistical Crop Grouping	Maximum Yield (lbs/ac)	Minimum Yield (lbs/ac)	R Conversion Factor (lbs N/lbs yield)	Crop Exempt from INMP Reporting
MINT	MINT				
MISC FIELD CROPS	MISC FIELD CROPS	100,000			
MISC FRUIT TREE	MISC FRUIT TREE	75,000			
MISC NUT TREE	MISC NUT TREE	50,000			
MISC ROW CROP	MISC ROW CROP	100,000			
MISC VEGETABLE	MISC VEGETABLE	100,000			
MULBERRY	MISC FRUIT TREE	100,000			
NON-IRRIGATED CROP	NON-IRRIGATED CROP				Y
NURSERY	NURSERY				
OAT	OAT - NR	50,000	500		
OAT - GRAIN	OAT - GRAIN	20,000	500	0.01885	
OAT - FODDER/SILAGE	OAT - FODDER/SILAGE	50,000	500	0.01085	
OAT - GREENCHOP	OAT - GREENCHOP	50,000	500		
OAT - SILAGE	OAT - SILAGE	50,000	500		
OAT - HAY	OAT - HAY	50,000	500	0.01085	
OKRA	OKRA	50,000			
OLIVE	OLIVE	50,000	300	0.00314	
OLIVE - OIL	OLIVE	50,000	300	0.00314	
OLIVE - TABLE	OLIVE	50,000	300	0.00314	
ONION	ONION	75,000		0.00197	
ONION - SEED	SEED CROP	3,000			
ORANGE	CITRUS	70,000	300	0.00148	
ORCHARD GRASS - HAY	ORCHARD GRASS - HAY	50,000		0.02725	
PASTURE	PASTURE				Y, if no N applied
PEA	PEA	50,000			
PEACH/NECTARINE	PEACH/NECTARINE	75,000	1,000	0.00113	
PEACH	PEACH/NECTARINE	75,000	1,000	0.00152	
PEAR	PEAR	75,000	1,000	0.000645	
PECAN	PECAN	10,000			
PEPPER	PEPPER	75,000		0.001655	
PERSIMMON	PERSIMMON	50,000			
PISTACHIO	PISTACHIO	10,000	100	0.0102	
PLUM/PLUOT	PLUM/PLUOT	75,000	300	0.001135	
POMEGRANATE	POMEGRANATE	75,000	300	0.00198	
POTATO	POTATO	75,000	1,000	0.00312	
PRUNE	PRUNE	20,000	300	0.0056	
PUMPKIN - SEED	VINE SEED	3,000			
PUMPKIN	PUMPKIN	75,000		0.00368	
RADISH	RADISH	50,000			
RANGELAND	RANGELAND				
RASPBERRY	BERRY	50,000			

Note:

Yield thresholds estimated from a variety of sources including CDFA production statistics, UCCE cost studies and literature, and previous years INMP data

Specific Crop	Statistical Crop Grouping	Maximum Yield (lbs/ac)	Minimum Yield (lbs/ac)	R Conversion Factor (lbs N/lbs yield)	Crop Exempt from INMP Reporting
RESEARCH	RESEARCH				
RICE	RICE	10,000			Y
RICE - WILD	RICE - WILD	10,000			
RYEGRASS	RYEGRASS - NR	50,000	500	0.02745	
RYEGRASS - GREENCHOP	RYEGRASS - GREENCHOP	50,000	500		
RYEGRASS - SILAGE/HAYLAGE	RYEGRASS - SILAGE/HAYLAGE	50,000	500		
RYEGRASS - HAY	RYEGRASS - HAY	50,000	500	0.02745	
RYEGRASS - NON-IRRIGATED	NON-IRRIGATED CROP	50,000	500		Y
SAFFLOWER	SAFFLOWER	10,000	300	0.02585	
SAFFLOWER - NON-IRRIGATED	NON-IRRIGATED CROP	10,000	300	0.02585	Y
SEED CROP	SEED CROP	5,000			
SORGHUM/MILO	SORGHUM/MILO - NR	70,000	500	0.0165	
SORGHUM/MILO - GREENCHOP	SORGHUM/MILO - GREENCHOP	75,000	500		
SORGHUM/MILO - SILAGE	SORGHUM/MILO - SILAGE	75,000	500	0.00367	
SORGHUM/MILO - HAY	SORGHUM/MILO - HAY	75,000	500		
SORGHUM/MILO - GRAIN	SORGHUM/MILO - GRAIN	20,000	500	0.0165	
SQUASH	SQUASH	75,000		0.001835	
SQUASH - SEED	VINE SEED	3,000			
STRAWBERRY	STRAWBERRY	90,000			
SUDAN GRASS - SEED	SEED CROP	3,000			
SUDAN GRASS	SUDAN GRASS - NR	50,000			
SUDAN GRASS - GREENCHOP	SUDAN GRASS - GREENCHOP	50,000			
SUDAN GRASS - SILAGE	SUDAN GRASS - SILAGE	50,000			
SUDAN GRASS - HAY	SUDAN GRASS - HAY	50,000			
SUNFLOWER	SUNFLOWER	10,000	100	0.0316	
SUNFLOWER - NON-IRRIGATED	NON-IRRIGATED CROP	10,000	100	0.0316	Y
TOMATILLO	TOMATILLO	50,000	1,000		
TOMATO	TOMATO - NR	150,000	3,000		
TOMATO - FRESH MARKET	TOMATO - FRESH MARKET	200,000	3,000	0.001305	
TOMATO - PROCESSING	TOMATO - PROCESSING	200,000	3,000	0.00146	
TRITICALE	TRITICALE - NR	50,000	500	0.0202	
TRITICALE - GRAIN	TRITICALE - GRAIN	50,000	500	0.0202	
TRITICALE - GREENCHOP	TRITICALE - GREENCHOP	50,000	500		
TRITICALE - SILAGE/HAYLAGE	TRITICALE - SILAGE/HAYLAGE	50,000	500	0.004515	
TRITICALE - HAY	TRITICALE - HAY	50,000	500		
TURF	TURF				
TURNIP	TURNIP	70,000			
TURNIP - SEED	SEED CROP	3,000			
VEGETABLE SEED	SEED CROP	3,000			
VETCH	VETCH	20,000			
VINE SEED	VINE SEED	3,000			

Note:

Yield thresholds estimated from a variety of sources including CDFA production statistics, UCCE cost studies and literature, and previous years INMP data

Specific Crop	Statistical Crop Grouping	Maximum Yield (lbs/ac)	Minimum Yield (lbs/ac)	R Conversion Factor (lbs N/lbs yield)	Crop Exempt from INMP Reporting
WALNUT	WALNUT	15,000	300	0.0159	
WALNUT - NON-IRRIGATED	NON-IRRIGATED CROP	15,000	300	0.0159	Y
WATERMELON	WATERMELON	100,000		0.000695	
WATERMELON - SEED	VINE SEED	3,000			
WETLAND	WETLAND				Y
WHEAT	WHEAT - NR	50,000	500		
WHEAT - GRAIN	WHEAT - GRAIN	20,000	500	0.0215	
WHEAT - FODDER/SILAGE	WHEAT - FODDER/SILAGE	50,000	500	0.00525	
WHEAT - NON-IRRIGATED	NON-IRRIGATED CROP	50,000	500		Y
WHEAT - GREENCHOP	WHEAT - GREENCHOP	50,000	500		
WHEAT - SILAGE	WHEAT - SILAGE	50,000	500	0.00525	
WHEAT - HAY	WHEAT - HAY	50,000	500		
WINTER GRAIN	WINTER GRAIN	100,000			
WINTER VEGETABLE	WINTER VEGETABLE	50,000			
OTHER	OTHER				

Note:

Yield thresholds estimated from a variety of sources including CDFA production statistics, UCCE cost studies and literature, and previous years INMP data

ATTACHMENTS

Attachment 1: Annual Management Practice Implementation Data

Attachment 2: Annual Irrigation and Nitrogen Management Plan Summary Report Data

ATTACHMENT 1

ANNUAL MANAGEMENT PRACTICE IMPLEMENTATION DATA

Excel workbook provided electronically

ATTACHMENT 2

ANNUAL IRRIGATION AND NITROGEN MANAGEMENT PLAN SUMMARY REPORT DATA

Excel workbook provided electronically