UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, DC 20549

FORM 10-Q

(Mark One)

☒ **QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the quarterly period ended March 31, 2021

OR

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from __________ to __________

Commission File Number: 001-37383

Arcadia Biosciences, Inc.
(Exact Name of Registrant as Specified in its Charter)

Delaware **(State or other jurisdiction of incorporation or organization)**	**81-0571538** **(I.R.S. Employer Identification No.)**
202 Cousteau Place, Suite 105 **Davis, CA** **(Address of Principal Executive Offices)**	**95618** **(Zip Code)**

Registrant's telephone number, including area code: (530) 756-7077

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common	RKDA	NASDAQ CAPITAL MARKET

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☒ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer	☐	Accelerated filer	☐
Non-accelerated filer	☒	Smaller reporting company	☒
Emerging growth company	☐		

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☐ No ☒

As of May 10, 2021, the registrant had 21,336,249 shares of common stock outstanding, $0.001 par value per share.

Arcadia Biosciences, Inc.

FORM 10-Q FOR THE QUARTER ENDED March 31, 2021

INDEX

			Page
Part I —	**Financial Information**		1
	Item 1.	Condensed Consolidated Financial Statements:	1
		Condensed Consolidated Balance Sheets	1
		Condensed Consolidated Statements of Operations and Comprehensive Income	2
		Condensed Consolidated Statements of Stockholders' Equity	3
		Condensed Consolidated Statements of Cash Flows	4
		Notes to Condensed Consolidated Financial Statements	5
	Item 2.	Management's Discussion and Analysis of Financial Condition and Results of Operations	21
	Item 3.	Quantitative and Qualitative Disclosures About Market Risk	29
	Item 4.	Controls and Procedures	29
Part II —	**Other Information**		30
	Item 1.	Legal Proceedings	30
	Item 1A.	Risk Factors	30
	Item 2.	Unregistered Sales of Equity Securities and Use of Proceeds	30
	Item 3.	Defaults Upon Senior Securities	30
	Item 4.	Mine Safety Disclosures	30
	Item 5.	Other Information	30
	Item 6.	Exhibits	31
SIGNATURES			32

ITEM 1. CONDENSED CONSOLIDATED FINANCIAL STATEMENTS

Arcadia Biosciences, Inc.

Condensed Consolidated Balance Sheets

(Unaudited)

(In thousands, except share data)

	March 31, 2021	December 31, 2020
Assets		
Current assets:		
Cash and cash equivalents	$ 32,848	$ 14,042
Short-term investments	19,088	11,625
Accounts receivable	1,113	1,406
Inventories, net — current	2,663	3,812
Prepaid expenses and other current assets	901	811
Total current assets	56,613	31,696
Restricted cash	—	2,001
Property and equipment, net	3,480	3,539
Right of use asset	5,636	5,826
Inventories, net — noncurrent	4,290	3,485
Goodwill	408	408
Intangible assets, net	350	370
Other noncurrent assets	23	23
Total assets	$ 70,800	$ 47,348
Liabilities and stockholders' equity		
Current liabilities:		
Accounts payable and accrued expenses	$ 3,418	$ 4,105
Amounts due to related parties	26	80
Debt — current	1,141	1,141
Unearned revenue — current	63	8
Operating lease liability — current	705	717
Other current liabilities	264	263
Total current liabilities	5,617	6,314
Debt — noncurrent	96	2,105
Operating lease liability — noncurrent	5,228	5,389
Common stock warrant liabilities	12,016	2,708
Other noncurrent liabilities	2,140	2,280
Total liabilities	25,097	18,796
Commitments and contingencies (Note 16)		
Stockholders' equity:		
Common stock, $0.001 par value—150,000,000 shares authorized as of March 31, 2021 and December 31, 2020; 21,336,249 and 13,450,861 shares issued and outstanding as of March 31, 2021 and December 31, 2020, respectively	62	54
Additional paid-in capital	254,208	239,496
Accumulated deficit	(209,767)	(211,825)
Total Arcadia Biosciences stockholders' equity	44,503	27,725
Non-controlling interest	1,200	827
Total stockholders' equity	45,703	28,552
Total liabilities and stockholders' equity	$ 70,800	$ 47,348

See accompanying notes to the unaudited condensed consolidated financial statements.

Arcadia Biosciences, Inc.

Condensed Consolidated Statements of Operations and Comprehensive Income

(Unaudited)

(In thousands, except share and per share data)

	Three Months Ended March 31, 2021	2020
Revenues:		
Product	$ 803	$ 154
License	—	100
Royalty	25	30
Contract research and government grants	—	25
Total revenues	828	309
Operating expenses:		
Cost of product revenues	856	132
Research and development	1,159	2,244
Change in fair value of contingent consideration	(140)	—
Write-down of fixed assets	210	—
Selling, general and administrative	4,069	3,723
Total operating expenses	6,154	6,099
Loss from operations	(5,326)	(5,790)
Interest expense	(9)	(3)
Other income, net	7,463	72
Issuance and offering costs	(769)	—
Change in fair value of common stock warrant liabilities	322	8,161
Net income before income taxes	1,681	2,440
Income tax provision	—	(17)
Net income	1,681	2,423
Net loss attributable to non-controlling interest	(377)	(102)
Net income attributable to common stockholders	$ 2,058	$ 2,525
Net income per share attributable to common stockholders:		
Basic	$ 0.11	$ 0.29
Diluted	$ 0.11	$ 0.29
Weighted-average number of shares used in per share calculations:		
Basic	18,970,250	8,651,213
Diluted	19,042,962	8,674,610
Other comprehensive loss, net of tax		
Unrealized losses on investment securities	—	(1)
Other comprehensive loss	—	(1)
Comprehensive income attributable to common stockholders	$ 2,058	$ 2,524

See accompanying notes to the unaudited condensed consolidated financial statements.

Arcadia Biosciences, Inc.

Condensed Consolidated Statements of Stockholders' Equity

(Unaudited)

(In thousands, except share data)

	Common Stock		Additional Paid-In Capital	Accumulated Deficit	Non-Controlling Interest	Total Stockholders' Equity
	Shares	Amount				
Balance at December 31, 2020	13,450,861	$ 54	$ 239,496	$ (211,825)	$ 827	$ 28,552
Issuance of shares related to the January 2021 PIPE	7,876,784	8	15,508	—	—	15,516
Offering costs related to the January 2021 PIPE	—	—	(2,084)	—	—	(2,084)
Issuance of placement agent warrants related to issuance of January 2021 PIPE	—	—	942	—	—	942
Issuance of shares related to employee stock purchase plan	8,604	—	21	—	—	21
Non-controlling interest capital contribution	—	—	—	—	750	750
Stock-based compensation	—	—	325	—	—	325
Net income	—	—	—	2,058	(377)	1,681
Balance at March 31, 2021	21,336,249	$ 62	$ 254,208	$ (209,767)	$ 1,200	$ 45,703

	Common Stock		Additional Paid-In Capital	Accumulated Deficit	Accumulated Other Comprehensive (Loss) Income	Non-Controlling Interest	Total Stockholders' Equity
	Shares	Amount					
Balance at December 31, 2019	8,646,149	$ 49	$ 214,826	$ (207,171)	$ 1	$ 621	$ 8,326
Issuance of shares related to employee stock purchase plan	7,946	—	14	—	—	—	14
Stock-based compensation	—	—	772	—	—	—	772
Unrealized losses on available-for-sale securities	—	—	—	—	(1)	—	(1)
Non-controlling interest contributions	—	—	—	—	—	689	689
Net income (loss)	—	—	—	2,525	—	(102)	2,423
Balance at March 31, 2020	8,654,095	$ 49	$ 215,612	$ (204,646)	$ —	$ 1,208	$ 12,223

See accompanying notes to the unaudited condensed consolidated financial statements.

Arcadia Biosciences, Inc.

Condensed Consolidated Statements of Cash Flows

(Unaudited)

(In thousands)

	Three Months Ended March 31, 2021	Three Months Ended March 31, 2020
CASH FLOWS FROM OPERATING ACTIVITIES:		
Net income	$ 1,681	$ 2,423
Adjustments to reconcile net loss to cash used in operating activities:		
Change in fair value of common stock warrant liabilities	(322)	(8,161)
Change in fair value of contingent consideration	(140)	—
Issuance and offering costs	769	—
Depreciation	236	74
Amortization of intangible assets	20	—
Lease amortization	289	223
Net amortization of investment premium	—	(39)
Stock-based compensation	325	772
Unrealized gain on corporate securities	(7,463)	—
Write-down of fixed assets	210	—
Write-down of inventory	160	59
Changes in operating assets and liabilities:		
Accounts receivable	293	293
Inventories	184	(4,145)
Prepaid expenses and other current assets	(90)	(748)
Other noncurrent assets	—	(15)
Accounts payable and accrued expenses	(591)	227
Amounts due to related parties	(54)	(24)
Unearned revenue	55	(25)
Other current liabilities	3	—
Operating lease payments	(272)	(184)
Net cash used in operating activities	(4,707)	(9,270)
CASH FLOWS FROM INVESTING ACTIVITIES:		
Purchases of property and equipment	(485)	(778)
Purchases of investments	—	(1,292)
Proceeds from sales and maturities of investments	—	15,200
Net cash (used in) provided by investing activities	(485)	13,130
CASH FLOWS FROM FINANCING ACTIVITIES:		
Proceeds from issuance of common stock and warrants from January 2021 PIPE securities purchase agreement	25,147	—
Payments of offering costs relating to January 2021 PIPE securities purchase agreement	(1,912)	—
Principal payments on debt	(2,009)	(7)
Proceeds from ESPP purchases	21	14
Capital contributions received from non-controlling interest	750	689
Net cash provided by financing activities	21,997	696
Net increase in cash, cash equivalents and restricted cash	16,805	4,556
Cash, cash equivalents and restricted cash — beginning of period	16,043	8,417
Cash, cash equivalents and restricted cash — end of period	$ 32,848	$ 12,973
SUPPLEMENTAL DISCLOSURES OF CASH FLOW INFORMATION:		
Cash paid for income taxes	$ —	$ —
Cash paid for interest	$ 19	$ 3
NONCASH INVESTING AND FINANCING ACTIVITIES:		
Fixed assets acquired with notes payable	$ —	$ 37
Common stock warrants issued to placement agent and included in offering costs related to January 2021 PIPE securities purchase agreement	$ 942	$ —
Right of use assets obtained in exchange for new operating lease liabilities	$ —	$ 3,836
Purchases of fixed assets included in accounts payable and accrued expenses	$ 25	$ —

See accompanying notes to the unaudited condensed consolidated financial statements.

1. Description of Business and Basis of Presentation

Organization

Arcadia Biosciences, Inc. (the "Company"), was incorporated in Arizona in 2002 and maintains its headquarters in Davis, California, with additional facilities in Phoenix, Arizona, American Falls, Idaho, Molokai, Hawaii, and Albany, Oregon. The Company was reincorporated in Delaware in March 2015.

The Company is a leader in science-based approaches to developing high value crop productivity traits primarily in hemp, wheat, and soybean, designed to enhance farm economics by improving the performance of crops in the field, as well as their value as food ingredients, health and wellness products, and their viability for industrial applications. The Company uses state of the art gene-editing technology and advanced breeding techniques to develop these proprietary innovations which the Company is beginning to monetize through a number of methods including seed and grain sales, product extract sales, trait licensing and royalty agreements.

On August 9, 2019, the Company entered into a joint venture agreement with Legacy Ventures Hawaii, LLC ("Legacy," see Note 8) to grow, extract, and sell hemp products. The new partnership, Archipelago Ventures Hawaii, LLC ("Archipelago"), combines the Company's extensive genetic expertise and resources with Legacy's experience in hemp extraction and sales.

Basis of Presentation and Principles of Consolidation

The accompanying unaudited condensed consolidated financial statements have been prepared in accordance with accounting principles generally accepted in the United States ("GAAP") for interim financial statements and are in the form prescribed by the Securities and Exchange Commission (the "SEC") in instructions to Form 10-Q and Rule 10-01 of Regulation S-X. In the opinion of management, the accompanying condensed consolidated financial statements reflect all adjustments, consisting of normal recurring adjustments, considered necessary for a fair statement of the Company's financial position, results of operations and cash flows for the periods indicated. All material intercompany accounts and transactions have been eliminated in consolidation. The accompanying unaudited condensed consolidated financial statements include the accounts of the Company, Verdeca and Archipelago.

The Company uses a qualitative approach in assessing the consolidation requirement for variable interest entities ("VIEs"). This approach focuses on determining whether the Company has the power to direct the activities of the VIE that most significantly affect the VIE's economic performance and whether the Company has the obligation to absorb losses, or the right to receive benefits, that could potentially be significant to the VIE.

For all periods presented, the Company has determined that it is the primary beneficiary of Archipelago, a joint venture, as it has a controlling interest in Archipelago. Accordingly, the Company consolidates Archipelago in the condensed consolidated financial statements after eliminating intercompany transactions. For consolidated joint ventures, the non-controlling partner's share of the assets, liabilities and operations of the joint venture is included in non-controlling interests as equity of the Company. The non-controlling partner's interest is generally computed as the joint venture partner's ownership percentage of Archipelago. Net loss attributable to non-controlling interest of $376,700 and $102,000 is recorded as an adjustment to net loss to arrive at net loss attributable to common stockholders for the three months ended March 31, 2021 and 2020, respectively. The non-controlling partner's equity interests are presented as non-controlling interests on the condensed consolidated balance sheets as of March 31, 2021.

The information included in these condensed consolidated financial statements and notes thereto should be read in conjunction with Management's Discussion and Analysis of Financial Condition and Results of Operations included herein and Management's Discussion and Analysis of Financial Condition and Results of Operations and the condensed consolidated financial statements and notes thereto for the fiscal year ended December 31, 2020 included in the Company's Annual Report on Form 10-K, filed with the SEC on March 31, 2021.

Liquidity, Capital Resources, and Going Concern

The accompanying condensed consolidated financial statements have been prepared on a going concern basis, which contemplates the realization of assets and the satisfaction of liabilities during the normal course of business. Since inception, the Company has financed its operations primarily through equity and debt financings. As of March 31, 2021, the Company had an accumulated deficit of $209.8 million, cash and cash equivalents of $32.8 million, and short-term investments of $19.1 million. For the three months ended March 31, 2021, the Company had net income of $1.7 million and net cash used in operations of $4.7 million. For the twelve months ended December 31, 2020, the Company had net losses of $6.0 million and net cash used in operations of $30.2 million.

With cash and cash equivalents of $32.8 million and short-term investments of $19.1 million as of March 31, 2021, the Company believes that its existing cash, cash equivalents and investments will be sufficient to meet its anticipated cash requirements for at least through May 2022.

As is disclosed in Notes 11 and 12, on January 25, 2021, the Company entered into a securities purchase agreement with certain institutional and accredited investors relating to the issuance and sale in a private placement of shares of Company common stock and warrants for an aggregate of $25.1 million, exclusive of any related transaction fees.

The Company may seek to raise additional funds through debt or equity financings. The Company may also consider entering into additional partner arrangements. The sale of additional equity would result in dilution to the Company's stockholders. The incurrence of debt would result in debt service obligations, and the instruments governing such debt could provide for additional operating and financing covenants that would restrict operations. If the Company does require additional funds and is unable to secure adequate additional funding at terms agreeable to the Company, the Company may be forced to reduce spending, extend payment terms with suppliers, liquidate assets, or suspend or curtail planned development programs. Any of these actions could materially harm the business, results of operations and financial condition.

2. Recent Accounting Pronouncements

In June 2016, the FASB issued ASU No. 2016-13, *Financial Instruments – Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments*. Additionally, the FASB issued ASU No. 2019-04, *Codification Improvements to Topic 326* in April 2019 and ASU 2019-05, *Financial Instruments — Credit Losses (Topic 326) — Targeted Transition Relief* in May 2019. The amendments affect loans, debt securities, trade receivables, net investments in leases, off-balance-sheet credit exposures, reinsurance receivables, and any other financial assets not excluded from the scope that have the contractual right to receive cash. In November 2019, the FASB issued ASU No. 2019-10, which defers the effective date of ASU No. 2016-13 for smaller reporting companies to fiscal years beginning after December 15, 2022, including interim periods within those fiscal years. The Company is currently evaluating the impact of the adoption of ASU No. 2016-13 on the condensed consolidated financial statements.

In December 2019, the FASB issued ASU No. 2019-12, *Income Taxes (Topic 740): Simplifying the Accounting for Income Taxes.* The amendments simplify the accounting for income taxes by removing certain exceptions to the general principles in Topic 740 and clarifying other areas of existing guidance. The amendments are effective for all entities for fiscal years beginning after December 15, 2020. The Company adopted ASU No. 2019-12 on January 1, 2021 with an immaterial impact on the Company's disclosures.

3. Inventory

Inventory costs are tracked on a lot-identified basis and are included as cost of product revenues when sold. Inventories are stated at the lower of cost or net realizable value. The Company makes adjustments to inventory when conditions indicate that the net realizable value may be less than cost due to physical deterioration, obsolescence, changes in price levels, or other factors. Additional adjustments to inventory are made for excess and slow-moving inventory on hand that is not expected to be sold within a reasonable timeframe to reduce the carrying amount to its estimated net realizable value. The write-downs to inventory are included in cost of product revenues and are based upon estimates about future demand from the Company's customers and distributors and market conditions. The Company recorded a write-down of hemp seed inventories of $160,000 during the three months ended March 31, 2021. The Company recorded write-downs of wheat inventory of $59,000 for the three months ended March 31, 2020. If there are significant changes in demand and market conditions, substantial future write-downs of inventory may be required, which would materially increase our expenses in the period the write down is taken and materially affect our operating results.

Inventories, net consist of the following (in thousands):

	March 31, 2021	December 31, 2020
Raw materials	$ 849	$ 966
Goods in process	636	1,921
Finished goods	5,468	4,410
Inventories	$ 6,953	$ 7,297

4. Property and Equipment, Net

Property and equipment, net consisted of the following (in thousands):

	March 31, 2021	December 31, 2020
Laboratory equipment	$ 2,977	$ 2,951
Software and computer equipment	654	591
Machinery and equipment	2,078	2,046
Furniture and fixtures	181	181
Vehicles	484	428
Leasehold improvements	2,229	2,229
Property and equipment, gross	8,603	8,426
Less accumulated depreciation and amortization	(5,123)	(4,887)
Property and equipment, net	$ 3,480	$ 3,539

Depreciation expense was $236,000 and $74,000 for the three months ended March 31, 2021 and 2020, respectively.

As of March 31, 2021, and December 31, 2020, respectively, there was $638,000 and $239,000 of construction in progress included in property and equipment that had not been placed into service and was not subject to depreciation.

During the quarter ended March 31, 2021, the State of Hawaii's Senate decided not to vote on a CBD processing bill in 2021, hence the earliest vote could happen in 2022, and its effectiveness into law will most likely be pushed to 2023. As a result, we assessed Archipelago's fixed assets related to CBD processing for impairment and recorded a write-down in the amount of $210,000 for the three months ended March 31, 2021, calculated through an asset recoverability test. Given the uncertainty in the legislative developments in Hawaii, it is reasonably possible that the entity's estimate that it will recover the carrying amount of this equipment from future operations will change in the near term.

5. Investments and Fair Value Instruments

Investments

The Company classified its investments in corporate securities of Bioceres Crop Solutions Corp. ("BIOX") as short-term investments. The BIOX shares of common stock have a six-months trading restriction, expiring on May 12, 2021. The investments are carried at fair value, based on quoted market prices or other readily available market information. Unrealized and realized gains and losses are recognized as other income in the consolidated statements of operations and comprehensive income.

The following tables summarize the amortized cost and fair value of the investment securities portfolio at March 31, 2021 and December 31, 2020. The Company recorded unrealized gains of $7.5 million for the three months ended March 31, 2021, associated with the corporate securities in other income, net, in the consolidated statements of operations and comprehensive income.

(Dollars in thousands)	Amortized Cost	Unrealized Gains	Unrealized Losses	Estimated Fair Value
March 31, 2021				
Cash equivalents:				
Money market funds	$ 28,294	$ —	$ —	$ 28,294
Short-term investments:				
Corporate securities	10,969	8,119	—	19,088
Total Assets at Fair Value	$ 39,263	$ 8,119	$ —	$ 47,382

(Dollars in thousands)	Amortized Cost	Unrealized Gains	Unrealized Losses	Estimated Fair Value
December 31, 2020				
Cash equivalents:				
Money market funds	$ 12,082	$ —	$ —	$ 12,082
Short-term investments:				
Corporate securities	10,969	656	—	11,625
Total Assets at Fair Value	$ 23,051	$ 656	$ —	$ 23,707

The Company did not have any investment categories that were in a continuous unrealized loss position for more than twelve months as of March 31, 2021.

Fair Value Measurement

The fair value of the investment securities at March 31, 2021 were as follows:

	Fair Value Measurements at March 31, 2021			
(Dollars in thousands)	Level 1	Level 2	Level 3	Total
Assets at Fair Value				
Cash equivalents:				
Money market funds	$ 28,294	$ —	$ —	$ 28,294
Short-term investments:				
Corporate securities	19,088	—	—	19,088
Total Assets at Fair Value	$ 47,382	$ —	$ —	$ 47,382

The fair value of the investment securities at December 31, 2020 were as follows:

	Fair Value Measurements at December 31, 2020			
(Dollars in thousands)	Level 1	Level 2	Level 3	Total
Assets at Fair Value				
Cash equivalents:				
Money market funds	$ 12,082	$ —	$ —	$ 12,082
Short-term investments:				
Corporate securities	11,625	—	—	11,625
Total Assets at Fair Value	$ 23,707	$ —	$ —	$ 23,707

The Company uses the market approach technique to value its financial instruments and there were no changes in valuation techniques during 2021 or 2020. The Company's financial instruments consist primarily of cash and cash equivalents, accounts receivable, accounts payable, accrued liabilities, and notes payable. For accounts receivable, accounts payable, accrued liabilities, and notes payable the carrying amounts of these financial instruments as of March 31, 2021 and December 31, 2020 were considered representative of their fair values due to their short term to maturity or repayment. Cash equivalents are carried at cost, which approximates their fair value.

The Company's Level 3 liabilities consist of a contingent liability resulting from the Anawah acquisition, as described in Note 16, a contingent liability resulting from the Industrial Seed Innovations acquisition, as described in Note 6, and common stock warrant liabilities related to the March 2018, the June 2019, the September 2019, and the January 2021 Offerings described in Note 12.

The contingent liability related to the Anawah acquisition was measured and recorded on a recurring basis as of March 31, 2021 and December 31, 2020, using unobservable inputs, namely the Company's ability and intent to pursue certain specific products developed using technology acquired in the purchase. A significant deviation in the Company's ability and/or intent to pursue the technology acquired in the purchase could result in a significantly lower (higher) fair value measurement. The contingent liability related to the ISI acquisition was measured and recorded on a recurring basis as of March 31, 2021 and December 31, 2020, using unobservable inputs, namely ISI's forecasted revenue. A significant deviation in ISI's forecasted revenue could result in a significantly lower (higher) fair value measurement.

The warrant liabilities were measured and recorded on a recurring basis using the Black-Scholes Model with the following assumptions at March 31, 2021 and December 31, 2020:

	January 2021 Warrants		September 2019 Warrants		June 2019 Warrants		March 2018 Warrants	
	March 31, 2021	December 31, 2020	March 31, 2021	December 31, 2020	March 31, 2021	December 31, 2020	March 31, 2021	December 31, 2020
Expected term (in years)	5.33	—	3.95	4.20	3.71	3.96	1.97	2.22
Expected volatility	126.0%	—	137.3%	135.0%	139.4%	135.0%	122.8%	130.0%
Risk-free interest rate	0.9%	—	0.6%	0.3%	0.6%	0.3%	0.2%	0.1%
Expected dividend yield	0%	—	0%	0%	0%	0%	0%	0%

The significant input used in the fair value measurement of the Company's Level 3 warrant liabilities is volatility. A significant increase (decrease) in volatility could result in a significantly higher (lower) fair value measurement.

The following table sets forth the establishment of the Company's Level 3 liabilities, as well as a summary of the changes in the fair value and other adjustments (in thousands):

	(Level 3)					
(Dollars in thousands)	Common Stock Warrant Liability - March 2018 Purchase Agreement	Common Stock Warrant Liability - June 2019 Offering	Common Stock Warrant Liability - September 2019 Offering	Common Stock Warrant Liability - January 2021 Offering	Contingent Liabilities	Total
Balance as of December 31, 2020	$ 662	$ 832	$ 1,214	$ -	$ 2,280	$ 4,987
Initial recognition	—	—	—	9,631	—	$ 9,631
Change in fair value and other adjustments	(64)	85	111	(454)	(140)	$ (461)
Balance as of March 31, 2021	$ 598	$ 917	$ 1,325	$ 9,176	$ 2,140	$ 14,156

6. Industrial Seed Innovations Acquisition

In August 2020, the Company acquired by merger Industrial Seed Innovations (ISI), an Oregon-based industrial hemp breeding and seed company. As a result of the acquisition, the Company acquired ISI's commercial and genetic assets, including seed varieties, germplasm library and intellectual property. ISI's Rogue and Umpqua seed varieties are now part of Arcadia's portfolio, alongside the Company's GoodHemp line of genetically superior hemp seeds, transplants, and extracts. The acquisition has significantly broadened and accelerated commercialization of Arcadia's hemp-related breeding platform, as well as established a breeding research and development facility in the Pacific Northwest, a key production area in the hemp industry.

The purchase price consideration for the acquisition totaled an estimated $1,212,000, of which $500,000 in cash and $432,000, in the form of 132,626 shares of the Company's common stock, was paid during the month of August 2020. The remaining amount of $280,000 will be recognized in two annual installments, each of up to 132,626 shares of the Company's common stock, subject to the achievement of revenue milestones in 2021 and 2022, and is recorded as a contingent liability in the condensed consolidated balance sheets as of March 31, 2021. The cash consideration paid for the acquisition was funded by cash on hand.

Acquisition costs are not included as components of consideration transferred and instead are accounted for as expenses in the period in which the costs are incurred. The Company incurred costs related to the ISI acquisition of approximately $67,000 included in selling, general and administrative expenses in the Company's condensed consolidated statements of operations and comprehensive loss for the quarter ended September 30, 2020.

The following table presents the allocation of the purchase price of ISI assets acquired, based on their relative fair values, which was assessed during the year ended December 31, 2020.

	Purchase Price Allocation
Inventory	$ 511
Intangible assets, net	400
Goodwill	408
Deferred tax liability	(107)
Total consideration allocated	$ 1,212

A deferred tax liability arising from the difference between book purchase price allocation and tax basis has been assessed in the amount of $107,000. Deferred tax liabilities are required to be recorded in purchase accounting independently of whether the acquiror has a valuation allowance on its own net deferred tax assets. As a result, the combined entity now has additional deferred tax liabilities available to reduce the amount of valuation allowance necessary. Future reversals of existing taxable temporary differences are an objective source of future taxable income. Accordingly, the purchase accounting deferred tax liabilities enabled the realization of a portion of the existing deferred tax assets, thus allowing for a reduction in the valuation allowance. The reduction in the valuation allowance is not accounted for as part of the purchase accounting but is recognized in the consolidated statements of operations and comprehensive income as a discrete tax benefit in the income tax provision.

The former shareholders of ISI remain responsible for ISI's pre-acquisition liabilities. Pursuant to the definitive acquisition agreement, the Company entered into a lease agreement with ISI for the use of land, equipment, greenhouses and buildings. The lease was effective upon the execution of the definitive acquisition agreement and has a term of 3 years with the option to renew for three additional 3-year terms.

7. Intangible assets, net

The Company's intangible assets, net as of March 31, 2021, consist of the following:

	March 31, 2021			December 31, 2020		
	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount
Amortized intangible assets						
Intellectual property	$ 310	$ 44	$ 266	$ 310	$ 27	$ 283
Customer lists	40	6	34	40	3	37
Total amortizable intangible assets	$ 350	$ 50	$ 300	$ 350	$ 30	$ 320
Unamortized intangible assets						
Brands and trademarks	$ 50	$ —	$ 50	$ 50	$ —	$ 50
Total intangible asset, net	$ 400	$ 50	$ 350	$ 400	$ 30	$ 370

Intellectual property and customer lists will be amortized based on their useful life of approximately four years. As of March 31, 2021, future amortization of intellectual property and customer lists is as follows:

Year Ending December 31,	
2021 (excluding the three months ended March 31, 2021)	$ 60
2022	80
2023	80
2024	80
Total	$ 300

8. Consolidated Joint Venture

In 2019, the Company and Legacy Ventures Hawaii, LLC, a Nevada limited liability company ("Legacy"), formed Archipelago Ventures Hawaii, LLC, a Delaware limited liability company and entered into a Limited Liability Company Operating Agreement (the "Operating Agreement"). The Company and Legacy formed Archipelago to develop, extract and commercialize hemp-derived products from industrial hemp grown in Hawaii.

Pursuant to the Operating Agreement, a joint operating committee consisting of two individuals appointed by the Company and two individuals appointed by Legacy will manage Archipelago. As of March 31, 2021, the Company and Legacy hold 50.75% and 49.25% interests in Archipelago, respectively, and have made capital contributions to Archipelago of $3,109,000 and $3,017,000, respectively, as determined by the joint operating committee. The Operating Agreement includes indemnification rights, non-competition obligations, and certain rights and obligations in connection with the transfer of membership interests, including rights of first refusal.

The Company consolidates Archipelago in the condensed consolidated financial statements after eliminating intercompany transactions. Net loss attributable to non-controlling interest of $376,700 and $102,000 is recorded as an adjustment to net income to arrive at net income attributable to common stockholders for the three months ended March 31, 2021, and 2020, respectively. Legacy's equity interests are presented as non-controlling interests on the condensed consolidated balance sheets. Refer to Note 1 for basis of presentation.

9. Collaborative Arrangements

In August 2017, the Company entered into a collaborative arrangement for the research, development and commercialization of an improved wheat quality trait in North America. This collaborative arrangement is a contractual agreement with Corteva AgriScience ("Corteva") and involves a joint operating activity where both Arcadia and Corteva are active participants in the activities of the collaboration. Arcadia and Corteva participate in the research and development, and Arcadia has the primary responsibility for the intellectual property strategy while Corteva will generally lead the marketing and commercialization efforts. Both parties are exposed to significant risks and rewards of the collaboration and the agreement includes both cost sharing and profit sharing. The activities are performed with no guarantee of either technological or commercial success.

The Company accounts for research and development ("R&D") costs in accordance ASC 730, *Research and Development*, which states R&D costs must be charged to expense as incurred. Accordingly, internal R&D costs are expensed as incurred. Third-party R&D costs are expensed when the contracted work has been performed or as milestone results are achieved.

10. Leases

Operating Leases

As of March 31, 2021, the Company leases office space in Davis, CA, Phoenix, AZ, and Molokai, HI, as well as additional buildings, land and equipment. Leases with an initial term of 12 months or less are not recorded on the balance sheet; the Company recognizes lease expense for these short-term leases on a straight-line basis. The Company subleases a portion of the Davis office lease to third parties. During the three months ended March 31, 2021, the Company entered into a lease for office space in Chesterfield, MO, with a lease term of 38 months following the commencement date and no renewal option. The lease commenced in April of 2021. There are no other leases that have not yet commenced as of March 31, 2021.

Some leases (the Davis office, warehouse, greenhouses and a copy machine) include one or more options to renew, with renewal terms that can extend the lease term from one to six years. The exercise of lease renewal options is at the Company's sole discretion.

The Company's lease agreements do not contain any material variable lease payments, material residual value guarantees or material restrictive covenants. Leases consisted of the following (in thousands):

Leases	Classification	March 31, 2021	December 31, 2020
Assets			
Operating lease assets	Right of use asset	$ 5,636	$ 5,826
Total leased assets		$ 5,636	$ 5,826
Liabilities			
Current - Operating	Operating lease liability- current	$ 705	$ 717
Noncurrent - Operating	Operating lease liability- noncurrent	5,228	5,389
Total leased liabilities		$ 5,933	$ 6,106

Lease Cost	Classification	For the Three Months Ended March 31, 2021	For the Three Months Ended March 31, 2020
Operating lease cost	SG&A and R&D Expenses	$ 289	$ 223
Short term lease cost (1)	R&D Expenses	47	80
Short term lease cost	SG&A Expenses	11	—
Sublease income (2)	SG&A and R&D Expenses	(14)	(11)
Net lease cost		$ 333	$ 292

(1) Short term lease cost consists of field trial lease agreements with a lease term of 12 months or less.
(2) Sublease income is recorded as a reduction to lease expense.

Lease Term and Discount Rate	March 31, 2021	December 31, 2020
Weighted-average remaining lease term (years)	5.0	5.0
Weighted-average discount rate	6.3%	6.0%

11. Equity Financing

Private Placements

In January 2021, the Company issued in a private placement offering (the “January 2021 Private Placement”) pursuant to a securities purchase agreement (“January 2021 Purchase Agreement”) (i) 7,876,784 shares of its common stock, and (ii) warrants to purchase up to 3,938,392 shares of common stock at an exercise price of $3.13 per share (the “January 2021 Warrants”) and raised total gross proceeds of $25.1 million. The January 2021 Warrants are exercisable at any time at the option of the holder and expire 5.5 years from the date of issuance. In connection with the January 2021 Private Placement, the Company granted to a placement agent warrants to purchase a total of 393,839 shares of Common Stock (the “January 2021 Placement Agent Warrants”) that have an exercise price per share equal to $3.99 and a term of 5.5 years from the date of issuance.

The common stock warrants are classified as a liability within Level 3 due to a contingent cash payment feature. The Company utilized a Black Scholes Merton model on January 28, 2021 with the following assumptions: volatility of 123.8 percent, stock price of $2.88 and risk-free rate of 0.5%. The estimated fair value of the common stock warrant liability was subsequently remeasured at March 31, 2021 with the changes recorded on the Company’s condensed consolidated statements of operations and comprehensive income. See Note 5.

The January 2021 Placement Agent Warrants were issued for services performed by the placement agent as part of the January 2021 Private Placement and were treated as offering costs. The value of the January 2021 Placement Agent Warrants was determined to be $942,000 using the Black-Scholes Model with input assumptions including the Company’s stock price, expected life of the warrants, stock price volatility determined from the Company’s historical stock prices, and the risk-free interest rate for the term of the warrants. The Company incurred additional offering costs totaling $1.9 million that consist of direct incremental legal, advisory, accounting and filing fees relating to the January 2021 Private Placement. The offering costs, inclusive of the January 2021 Placement Agent Warrants, totaled $2.8 million and allocated to the common stock warrant liability and the common stock using their relative fair values. A total of $769,000 was allocated to the common stock warrant liability and expensed and the remaining $2.0 million was allocated to the common stock and offset to additional paid in capital.

In March 2018, the Company issued in a private placement offering (the “March 2018 Private Placement”) pursuant to a securities purchase agreement (“March 2018 Purchase Agreement”) (i) 300,752 shares of its common stock and (ii) warrants to purchase up to 300,752 shares of common stock at an initial exercise price equal to $45.75 (the “March 2018 Warrants”) and raised total gross proceeds of $10.0 million. The March 2018 Warrants are exercisable at any time at the option of the holder and expire five years from the date of issuance. In connection with the March 2018 Private Placement, the Company granted to a placement agent warrants to purchase a total of 15,038 shares of Common Stock (the “March 2018 Placement Agent Warrants”) that have an exercise price per share equal to $41.5625 and a term of five years from the date of issuance.

The number of shares of common stock and the number and exercise price of the March 2018 Warrants issued in the March 2018 Private Placement were subject to adjustments as provided in the March 2018 Purchase Agreement. Following the adjustments as provided in the March 2018 Purchase Agreement, the number of shares issued to the purchasers was 1,201,634, the total number of shares issuable upon exercise of the March 2018 Warrants was 1,282,832 and the per share exercise price of the March 2018 Warrants was $10.7258.

Registered Direct Offerings

On May 11, 2018, the Company filed a shelf Registration Statement on Form S-3 with the SEC which was declared effective on June 8, 2018 (“Shelf Registration Statement”). This shelf registration process allows the Company to sell any combination of common stock, preferred stock, warrants and units consisting of such securities in one or more offerings from time to time having aggregate offering prices of up to $50 million.

In June 2018, the Company entered into a securities purchase agreement (the “June 2018 Purchase Agreement”) pursuant to which it sold (i) 1,392,345 registered shares of its common stock pursuant to the Shelf Registration Statement and (ii) unregistered warrants to purchase 1,392,345 shares of its common stock (the “June 2018 Warrants”) in a private placement, for total gross proceeds of $14.0 million (the “June 2018 Registered Direct Offering”). The June 2018 Registered Direct Offering closed on June 14, 2018. The June 2018 Warrants have an exercise price of $9.94 per share, became exercisable upon issuance and expire 5.5 years after the date of issuance. In connection with the June 2018 Registered Direct Offering, the Company granted to a placement agent warrants to purchase a total of 69,617 shares of common stock (“June 2018 Placement Agent Warrants”) that have an exercise price per share equal to $12.568 and a term of five years.

In June 2019, the Company entered into a securities purchase agreement (the “June 2019 Purchase Agreement”) pursuant to which it sold (i) 1,489,575 registered shares of its common stock pursuant to the Shelf Registration Statement and (ii) unregistered warrants to purchase 1,489,575 shares of its common stock (the “June 2019 Warrants”) in a private placement, for total gross proceeds of $7.5 million (the “June 2019 Registered Direct Offering”). The June 2019 Registered Direct Offering closed on June 14, 2019. The June 2019 Warrants have an exercise price of $5.00 per share, became exercisable upon issuance and expire 5.5 years after the date of issuance. In connection with the June 2019 Registered Direct Offering, the Company granted to a placement agent warrants to purchase a total of 74,479 shares of common stock ("June 2019 Placement Agent Warrants") that have an exercise price per share equal to $6.2938 and a term of five years.

In September 2019, the Company entered into a securities purchase agreement (the "September 2019 Purchase Agreement") pursuant to which it sold (i) 1,318,828 registered shares of its common stock pursuant to the Shelf Registration Statement and (ii) unregistered warrants to purchase 659,414 shares of its common stock (the "September 2019 Warrants") in a private placement, for total gross proceeds of $10.0 million (the "September 2019 Registered Direct Offering"). The September 2019 Registered Direct Offering closed on September 5, 2019. The September 2019 Warrants have an exercise price of $7.52 per share, became exercisable upon issuance and expire 5.5 years after the date of issuance. In connection with the September 2019 Registered Direct Offering, the Company granted to a placement agent warrants to purchase a total of 65,942 shares of common stock ("September 2019 Placement Agent Warrants") that have an exercise price per share equal to $9.4781 and a term of five years.

In December 2020, the Company entered into a securities purchase agreement (the "December 2020 Purchase Agreement") pursuant to which it sold (i) 2,618,658 registered shares of its common stock pursuant to the Shelf Registration Statement and (ii) unregistered warrants to purchase 2,618,658 shares of its common stock (the "December 2020 Warrants") in a private placement, for total gross proceeds of $8.0 million (the "December 2020 Registered Direct Offering"). The December 2020 Registered Direct Offering closed on December 22, 2020. The December 2020 Warrants have an exercise price of $3.00 per share, became exercisable upon issuance and expire 5.5 years after the date of issuance. In connection with the December 2020 Registered Direct Offering, the Company granted to a placement agent warrants to purchase a total of 130,933 shares of common stock ("December 2020 Placement Agent Warrants") that have an exercise price per share equal to $3.8188 and a term of five years. See Note 12.

12. Warrants

Common Stock Warrant transactions

In May 2020, several existing accredited investors exercised the June 2018 Warrants (the "May 2020 Warrant Exercise Transaction") to purchase up to an aggregate of 1,392,345 shares of the Company's common stock at a reduced exercise price of $4.90 per share for gross proceeds of $6.8 million. As consideration for the exercise of the June 2018 Warrants, the Company issued new unregistered warrants to purchase up to 1,392,345 shares of common stock (the "May 2020 Warrants") at an exercise price of $4.775 per share with an exercise period of five years from the date of issuance. The May 2020 Warrants were valued at $4.4 million, which was calculated using the Black-Scholes Model with the following assumptions: volatility of 128 percent, stock price of $3.81, and risk-free rate of 0.38%. In connection with the May 2020 Warrant Exercise Transaction, the Company granted to a placement agent warrants to purchase a total of 69,617 shares of common stock (the "May 2020 Placement Agent Warrants") that have an exercise price per share equal to $6.125 and a term of five years. The value of the May 2020 Placement Agent Warrants was determined to be $215,000 using the Black-Scholes Model. The Company recognized a gain on extinguishment of warrant liability in the amount of $47,000 associated with this transaction, during the quarter ended June 30, 2020.

In July 2020, an existing accredited investor exercised its March 2018 Warrants (the "July 2020 Warrant Exercise Transaction") to purchase up to an aggregate of 641,416 shares of the Company's common stock at a reduced exercise price of $3.975 per share for gross proceeds of $2.6 million. As consideration for the exercise of these March 2018 Warrants, the Company issued new unregistered warrants to purchase up to 641,416 shares of common stock (the "July 2020 Warrants") at an exercise price of $3.85 per share with an exercise period of 5.5 years from the date of issuance. The July 2020 Warrants were valued at $2.1 million, which was calculated using the Black-Scholes Model with the following assumptions: volatility of 126 percent, stock price of $3.73, and risk-free rate of 0.35%. In connection with the July 2020 Warrant Exercise Transaction, the Company granted to a placement agent warrants to purchase a total of 32,071 shares of common stock (the "July 2020 Placement Agent Warrants") that have an exercise price per share equal to $4.969 and a term of 5.5 years. The value of the July 2020 Placement Agent Warrants was determined to be $101,000 using the Black-Scholes Model. The Company recognized a loss on extinguishment of warrant liability in the amount of $682,000 associated with this transaction, during the quarter ended September 30, 2020.

Equity Classified Common Stock Warrants

In connection with professional services agreements with non-affiliated third party entities, during the three months ended March 31, 2021 and the year ended December 31, 2020, the Company issued service and performance warrants ("Service and Performance Warrants").

As of March 31, 2021, the Company issued the following warrants to purchase shares of its common stock. These warrants are exercisable any time at the option of the holder until their expiration date.

	Issuance Date	Term	Exercise Price Per Share	Warrants Exercised during the Year Ended December 31, 2020	Warrants Outstanding at December 31, 2020	Warrants Exercised during the Three Months Ended March 31, 2021	Warrants Outstanding at March 31, 2021
January 2021 Placement Agent Warrants	January 2021	5.5 years	$ 3.99	—	—	—	393,839
January 2021 Service and Performance Warrants	January 2021	2 years	$ 3.08	—	—	—	7,500
December 2020 Warrants	December 2020	5.5 years	$ 3.00	—	2,618,658	—	2,618,658
December 2020 Placement Agent Warrants	December 2020	5 years	$ 3.82	—	130,933	—	130,933
July 2020 Warrants	July 2020	5.5 years	$ 3.85	—	641,416	—	641,416
July 2020 Placement Agent Warrants	July 2020	5.5 years	$ 4.97	—	32,071	—	32,071
May 2020 Warrants	May 2020	5 years	$ 4.78	—	1,392,345	—	1,392,345
May 2020 Placement Agent Warrants	May 2020	5 years	$ 6.13	—	69,617	—	69,617
March 2020 Service and Performance Warrants	March 2020	3 years	$ 2.50	—	18,350	—	18,350
February 12, 2020 Service and Performance Warrants	February 2020	2 years	$ 4.71	—	150,000	—	150,000
February 3, 2020 Service and Performance Warrants	February 2020	2 years	$ 4.91	—	10,000	—	10,000
September 2019 Placement Agent Warrants	September 2019	5 years	$ 9.48	—	65,942	—	65,942
August 2019 Service and Performance Warrants	August 2019	2 years	$ 1.92	—	20,000	—	20,000
July 2019 Service and Performance Warrants	July 2019	2 years	$ 2.19	—	10,000	—	10,000
June 2019 Placement Agent Warrants	June 2019	5 years	$ 6.29	—	74,479	—	74,479
April 2019 Service and Performance Warrants	April 2019	5 years	$ 6.18	—	145,154	—	145,154
June 2018 Placement Agent Warrants	June 2018	5 years	$ 12.57	—	69,617	—	69,617
March 2018 Placement Agent Warrants	March 2018	5 years	$ 41.56	—	15,038	—	15,038
Total				—	5,463,620	—	5,864,959

Liability Classified Common Stock Warrants

Certain warrants contain a contingent cash payment feature and therefore were accounted for as a liability at the date of issuance and are adjusted to fair value at each balance sheet date. The change in fair value of the warrant liability is recorded as change in fair value of common stock warrant liabilities in the consolidated statements of operations and comprehensive income. The key terms and activity of the liability classified common stock warrants are summarized as follows:

	Issuance Date	Term	Exercise Price Per Share	Warrants Exercised during the Year Ended December 31, 2020	Warrants Outstanding at December 31, 2020	Warrants Exercised during the Three Months Ended March 31, 2021	Warrants Outstanding at March 31, 2021
January 2021 Warrants	January 2021	5.5 years	$ 3.13	—	—	—	3,938,392
September 2019 Warrants	September 2019	5.5 years	$ 7.52	—	659,414	—	659,414
June 2019 Warrants	June 2019	5.5 years	$ 5.00	—	435,830	—	435,830
June 2018 Warrants	June 2018	5.5 years	$ 9.94	1,392,345	—	—	—
March 2018 Warrants	March 2018	5 years	$ 10.73	641,416	641,416	—	641,416
Total				2,033,761	1,736,660	—	5,675,052

See Note 5 for the Black-Scholes option-pricing model and weighted-average assumptions used to estimate the fair value of the warrant liabilities.

13. Stock-Based Compensation and Employee Stock Purchase Program

Stock Incentive Plans

The Company has two equity incentive plans: the 2006 Stock Plan (“2006 Plan”) and the 2015 Omnibus Equity Incentive Plan (“2015 Plan”).

In 2006, the Company adopted the 2006 Plan, which provided for the granting of stock options to executives, employees, and other service providers under terms and provisions established by the Board of Directors. The Company granted non-statutory stock options (“NSOs”) under the 2006 Plan until May 2015, when it was terminated as to future awards, although it continues to govern the terms of options that remain outstanding and were issued under the 2006 Plan. The 2015 Plan became effective upon the Company’s IPO in May 2015 and all shares that were reserved, but not issued, under the 2006 Plan were assumed by the 2015 Plan. Upon effectiveness, the 2015 Plan had 154,387 shares of common stock reserved for future issuance, which included 10,637 that were transferred to and assumed by the 2015 Plan. The 2015 Plan provides for automatic annual increases in shares available for grant. In addition, shares subject to awards under the 2006 Plan that are forfeited or canceled will be added to the 2015 Plan. The 2015 Plan provides for the grant of incentive stock options (“ISOs”), NSOs, restricted stock awards, stock units, stock appreciation rights, and other forms of equity compensation, all of which may be granted to employees, officers, non-employee directors, and consultants. The ISOs and NSOs will be granted at a price per share not less than the fair value at the date of grant. Options granted generally vest over a four-year period; however, the options granted in the third quarter of 2018 vest over two-year period, vesting monthly on a pro-rated basis. Options granted, once vested, are generally exercisable for up to 10 years, after grant.

In June 2019, the shareholders approved an amendment to the Company’s 2015 Plan for a one-time increase to the number of shares of common stock that may be issued under the 2015 Plan by 120,000 shares. As of March 31, 2021, a total of 1,594,667 shares of common stock were reserved for issuance under the 2015 Plan, of which 191,288 shares of common stock are available for future grant. As of March 31, 2021, a total of 9,782 and 1,403,379 options are outstanding under the 2006 and 2015 Plans, respectively. As of December 31, 2020, a total of 19,172 and 870,587 options are outstanding under the 2006 and 2015 Plans, respectively.

The following is a summary of stock option information and weighted average exercise prices under the Company's stock incentive plans (in thousands, except share data and price per share):

	Shares Subject to Outstanding Options		Weighted-Average Exercise Price Per Share		Aggregate Intrinsic Value
Outstanding — Balance at December 31, 2020	889,759	$	14.46	$	240
Options granted	566,853		3.03		
Options exercised	—		—		
Options forfeited	(105,342)		3.66		
Options expired	(11,120)		226.32		
Outstanding — Balance at March 31, 2021	1,340,150	$	8.72	$	7,035
Vested and expected to vest — March 31, 2021	1,304,842	$	8.83	$	7,010
Exercisable — March 31, 2021	527,259	$	16.68	$	346

Aggregate intrinsic value represents the difference between the exercise price of the options and the estimated fair value of the Company's common stock determined by our Board of Directors for each of the respective periods. The intrinsic value of options exercised was $0 for both quarters ended March 31, 2021 and 2020.

As of March 31, 2021, there was $1.8 million of unrecognized compensation cost related to unvested stock-based compensation grants that will be recognized over the weighted-average remaining recognition period of 3.40 years.

In determining the fair value of the stock-based awards, the Company uses the Black-Scholes option-pricing model and assumptions discussed below. Each of these inputs is subjective and generally requires significant judgment to determine.

Expected Term—The expected term is the estimated period of time outstanding for stock options granted and was estimated based on a simplified method allowed by the SEC due to insufficient historical data, and defines the term as the average of the contractual term of the options and the weighted-average vesting period for all open employee awards.

Expected Volatility—The historical volatility data was computed using the daily closing prices for the Company's shares during the equivalent period of the calculated expected term of the stock-based awards.

Risk-Free Interest Rate—The risk-free interest rate is based on the interest rate of U.S. Treasuries of comparable maturities on the date the options were granted.

Expected Dividend—The expected dividend yield is based on the Company's expectation of future dividend payouts to common stockholders.

The fair value of stock option awards was estimated at the date of grant using a Black-Scholes option-pricing model with the following weighted-average assumption:

	Three Months Ended March 31,	
Assumptions	2021	2020
Expected term (years)	6.03	6.03
Expected volatility	121.2%	122.5%
Risk-free interest rate	0.62%	1.40%
Expected dividend yield	—	—

The Company recognized $0.3 million and $0.8 million of compensation expense for stock options awards for the quarters ended March 31, 2021 and 2020, respectively.

Employee Stock Purchase Plan

The Company's 2015 Employee Stock Purchase Plan ("ESPP") became effective on May 14, 2015. The ESPP allows eligible employees to purchase shares of the Company's common stock at a discount of up to 15% of their eligible compensation through payroll deductions, subject to any plan limitations. After the first offering period, which began on May 14, 2015 and ended on February 1, 2016, the ESPP provides for six-month offering periods, and at the end of each offering period, employees are able to purchase shares at 85% of the lower of the fair market value of the Company's common stock on the first trading day of the offering period or on the last day of the offering period. As of March 31, 2021, the number of shares of common stock reserved for future issuance under the ESPP is 118,307. The ESPP provides for automatic annual increases in the shares available for purchase beginning on January 1, 2016. As of March 31, 2021, 43,660 shares had been issued under the ESPP. The Company recorded $5,000 and $13,000 of ESPP related compensation expense for the quarters ended March 31, 2021 and 2020, respectively.

14. Debt

Vehicle Loans

The Company entered into notes payable agreements to finance the purchase of company vehicles. The Company has various vehicle loans that mature in 2024 and have interest rates that range from 7.64% to 8.00%. As of March 31, 2021, the outstanding balance of vehicle loans was $129,000.

Paycheck Protection Program Note

On April 16, 2020, the Company borrowed $1.1 million and entered into a promissory note for the same amount (the "PPP Note") under the Paycheck Protection Program ("PPP") that was established under the Coronavirus Aid Relief, and Economic Security Act ("CARES Act") of 2020. The PPP Note matures on April 16, 2022, bears an interest rate of 1.00% per year, with interest accruing monthly beginning on November 2, 2020. The Company may prepay the PPP Note at any time prior to maturity with no prepayment penalties. The principal amount of the PPP Note and accrued interest are eligible for forgiveness if the proceeds are used for qualifying expenses, including payroll, rent, and utilities during the eight-week period commencing on April 16, 2020. The Company will be obligated to repay any portion of the principal amount of the PPP Note that is not forgiven, together with accrued interest thereon, until such unforgiven portion is paid in full. The Company intends to apply for loan forgiveness within the required timeframe. No assurance is provided that the Company will obtain forgiveness of the PPP Note in whole or in part. As of March 31, 2021, the outstanding balance of the PPP Note was $1.1 million.

Promissory Note

On June 26, 2020, the Company executed a promissory note (the "Note") in the amount of $2.0 million, payable to MidFirst Bank, a federally chartered savings association (the "Lender"). The Note was issued in accordance with the terms of a Loan Agreement dated as of May 18, 2020 entered into by the Company and the Lender (the "Loan Agreement") in which the Lender agreed to make advances to the Company from time to time, at any amount up to but not to exceed $2.0 million. Pursuant to the Loan Agreement, the Note accrues interest, adjusted monthly, at a rate equal to the greater of (i) 3.25% and (ii) the sum of (a) the quotient of the LIBOR Index divided by (one minus the reserve requirement set by the Federal Reserve), and (b) 2.50%.   The Company is required to make monthly interest payments on the Note to the Lender and pay the full principal amount plus any accrued but unpaid interest outstanding under the Note no later than May 18, 2023. The Company and the Lender also entered into a Pledge and Security Agreement dated as of May 18, 2020 whereby the Company agreed to secure the Note by granting a security interest to the Lender for the Company's deposit account held with and controlled by the Lender. Due to the lender's control of the deposit account, the balance of $2.0 million is included in restricted cash on the consolidated balance sheets as of December 31, 2020. As of March 31, 2021, there was no outstanding balance of the Note. On February 26, 2021, the Company repaid the full balance of $2.0 million, and on March 31, 2021, the line of credit was closed.

Maturities of current and noncurrent debt as of March 31, 2021, are as follows (in thousands):

Years ending December 31,	**Amounts**
Remainder of 2021	$ 1,134
2022	36
2023	39
2024	27
2025	1
Thereafter	—
Total	$ 1,237

15. Income Taxes

Income tax expense during interim periods is based on applying an estimated annual effective income tax rate to year-to-date income, plus any significant unusual or infrequently occurring items that are recorded in the interim period. The computation of the annual estimated effective tax rate at each interim period requires certain estimates and significant judgment including, but not limited to, the expected operating income for the year, projections of the proportion of income earned and taxed in various jurisdictions, permanent and temporary differences, and the likelihood of recovering deferred tax assets generated in the current year. The accounting estimates used to compute the provision for income taxes may change as new events occur, more experience is obtained, additional information becomes known, or as the tax environment changes.

The interim financial statement provision for income taxes is different from the amounts computed by applying the United States federal statutory income tax rate of 21%. The Company's effective tax rate was -0.01% and -0.10% for the three months ended March 31, 2021, and 2020. The difference between the effective tax rate and the federal statutory rate of 21% was primarily due to the full valuation allowance recorded on the Company's net deferred tax assets and foreign withholding taxes.

The Company experienced an ownership change under IRC Section 382 as a result of the common shares issued in connection with the June 2018 Offering. This ownership change limited the Company's ability to utilize its net operating loss carryforwards prior to expiration and certain net operating loss carryforwards were written off as a result. The Company is currently conducting additional analysis regarding the valuation of the Company at the time of the ownership change to assess what, if any, portion of the limitation may be reversed. Any adjustment to the amount of limitation will not impact the deferred tax asset balance due to the full valuation allowance. Further, the Company may have experienced an ownership change under IRC Section 382 as a result of the common shares issued in connection with the December 2020 Purchase Agreement or in the January 2021 Purchase Agreement. Such an ownership change could limit the Company's ability to utilize its NOL carryforwards prior to expiration but would not impact the net deferred tax asset recorded given the full valuation allowance.

During the three months ended March 31, 2021, there were no material changes to the Company's uncertain tax positions.

16. Commitments and Contingencies

Leases

The Company leases office and laboratory space, greenhouse space, grain storage bins, warehouse space, farmland, and equipment under operating lease agreements having initial lease terms ranging from one to five years, including certain renewal options available to the Company at market rates. The Company also leases land for field trials on a short-term basis. See Note 10.

Legal Matters

From time to time, in the ordinary course of business, the Company may become involved in certain legal proceedings. The Company currently is not a party to any material litigation or other material legal proceedings.

Contingent Liability Related to the Anawah Acquisition

In June 2005, the Company completed its agreement and plan of merger and reorganization with Anawah, Inc. ("Anawah"), to purchase the Anawah's food and agricultural research company through a non-cash stock purchase. Pursuant to the merger with Anawah, and in accordance with the ASC 805 - Business Combinations, the Company incurred a contingent liability not to exceed $5.0 million. This liability represents amounts to be paid to Anawah's previous stockholders for cash collected on revenue recognized by the Company upon commercial sale of certain specific products developed using technology acquired in the purchase. As of March 31, 2021, the Company continues to pursue two development programs using this technology and believes that the contingent liability is probable. As a result, $2.0 million remains on the condensed consolidated balance sheets as an other noncurrent liability.

Contingent Liability Related to the ISI Acquisition

In August 2020, the Company acquired by merger Industrial Seed Innovations (ISI). A portion of the purchase price consideration for the acquisition in the amount of $280,000 will be recognized in two annual installments, each of up to 132,626 shares of the Company's common stock, subject to the achievement of revenue milestones in 2021 and 2022. The contingent consideration of $280,000 was measured and recorded at fair value. As of March 31, 2021, the full amount of the contingent consideration is included in other noncurrent liabilities as no installments will become due within 12 months from the condensed consolidated balance sheets date. During the quarter ended March 31, 2021, as a result of a remeasurement of the contingent consideration, a $140,000 decrease in the related liability was recorded as a change in fair value of contingent consideration on the condensed consolidated statements of operations and comprehensive income.

Contracts

The Company has entered into contract research agreements with unrelated parties that require the Company to pay certain funding commitments. The initial terms of these agreements range from one to three years in duration and in certain cases are cancelable.

The Company licenses certain technologies via executed agreements ("In-Licensing Agreements") that are used to develop and advance the Company's own technologies. The Company has entered into various In-Licensing Agreements with related and unrelated parties that require the Company to pay certain license fees, royalties, and/or milestone fees. In addition, certain royalty payments ranging from 2% to 15% of net revenue amounts as defined in the In-Licensing Agreements are or will be due.

The Company could be adversely affected by certain actions by the government as it relates to government contract revenue received in prior years. Government agencies, such as the Defense Contract Audit Agency routinely audit and investigate government contractors. These agencies review a contractor's performance under its agreements; cost structure; and compliance with applicable laws, regulations and standards. The agencies also review the adequacy of, and a contractor's compliance with, its internal control systems and policies, including the contractor's purchasing, property, estimating, compensation and management information systems. While the Company's management anticipates no adverse result from an audit, should any costs be found to be improperly allocated to a government agreement, such costs will not be reimbursed, or if already reimbursed, may need to be refunded. If an audit uncovers improper or illegal activities, civil and criminal penalties and administrative sanctions, including termination of contracts, forfeiture of profits, suspension of payments or fines, and suspension or prohibition from doing business with the government could occur. In addition, serious reputational harm or significant adverse financial effects could occur if allegations of impropriety were made against the Company. There currently are routine audits in process relating to government grant revenues.

17. Net Income per Share

Basic net income per share is calculated by dividing net income by the weighted-average number of common shares outstanding during the period and excludes any dilutive effects of stock-based awards and warrants. Diluted net income per share is computed giving effect to all potentially dilutive common shares, including common stock issuable upon exercise of stock options and warrants.

The following table sets forth the computation of basic and diluted net income per common share (in thousands, except share and per share amounts):

	For the Three Months Ended March 31, 2021	2020
Net income per share - Basic		
Numerator:		
Net income attributable to common stockholders	$ 2,058	$ 2,525
Denominator:		
Weighted average number of common shares outstanding	18,970,250	8,651,213
Basic net income per share attributable to common stockholders:	$ 0.11	$ 0.29
Net income per share - Diluted		
Numerator:		
Net income attributable to common stockholders	$ 2,058	$ 2,525
Denominator:		
Weighted average number of common shares outstanding	18,970,250	8,651,213
Effect of dilutive stock options	—	1,345
Effect of dilutive warrants	72,712	22,052
Weighted average number of common shares outstanding - diluted	19,042,962	8,674,610
Diluted net income per share attributable to common stockholders:	$ 0.11	$ 0.29

18. Related-Party Transactions

The Company's related parties include Moral Compass Corporation ("MCC") and the John Sperling Foundation ("JSF"). The rights to the intellectual property owned by Blue Horse Labs, Inc. ("BHL") were assigned to its sole shareholder, the John Sperling Revocable Trust ("JSRT") due to BHL's dissolution and then subsequently to JSF. JSF is deemed a related party of the Company because MCC, one of the Company's largest stockholder, and JSF share common officers and directors.

JSF receives a single digit royalty from the Company when revenue has been collected on product sales or for license payments from third parties that involve certain intellectual property developed under research funding originally from BHL. Royalty fees due to JSF were $26,000 and $80,000 as of March 31, 2021 and December 31, 2020, respectively, and are included in the condensed consolidated balance sheets as amounts due to related parties.

The Company currently leases land on the island of Molokai, Hawaii from an entity owned by Kevin Comcowich, the Chair of the Company's Board of Directors, and his wife. The Company grows hemp on this land to support the operations of its joint venture Archipelago Ventures Hawaii. The original lease was executed in February 2019, covers 10 acres of land, has a term of two years and provides for rent payments of $1,200 per acre per year. During the quarter ended March 31, 2020, the Company engaged a third-party contractor to construct a fence on the property to adhere to the rules of the hemp pilot program. Out of pocket costs to build this fence were approximately $126,400. Mr. Comcowich supplied materials to the contractor and received payments from the contractor totaling approximately $44,000. In March and April 2020, the Company entered into two lease amendments for two additional 10-acre parcels and two additional 15-acre parcels, at the same lease rate of $1,200 per acre per year, and with a term of two years. The Company made lease payments in the amount of $36,000 and $5,000 for the quarters ended March 31, 2021 and 2020, respectively.

19. Subsequent Events

Agrasys

The Company acquired, through Arcadia SPA, S.L., the assets of Agrasys S.A., a food ingredients company based in Barcelona, Spain, for a purchase price of 205,000 Euros, or approximately $250,000. The transaction includes the physical and intellectual property assets to enable Arcadia to commercialize Tritordeum, a proprietary cereal grain. Tritordeum is a combination of durum wheat and wild barley, resulting in a nutritious grain that is high in fiber, protein and lutein, that was developed at the Instituto de Agricultura Sostenible – Consejo Superior de Investigaciones Científicas, (IAS-CSIC) the largest public institution dedicated to agricultural research in Spain, and subsequently licensed exclusively to Agrasys for commercialization. Arcadia completed the transaction through Arcadia SPA, S.L., a newly formed company based in Spain. Key Agrasys personnel will join Arcadia SPA and will operate the Tritordeum and GoodWheat business in Europe through that entity.

Soul Spring

On May 17, 2021, the Company closed a transaction to acquire the assets of Lief Holdings, LLC ("Lief"), EKO Holdings, LLC ("EKO") and Live Zola, LLC ("Zola") from The Parent Company US Holdings, LLC. The acquired portfolio of wellness products includes the CBD bath and body brand Soul Spring™, the all-natural body care product line Saavy Naturals™ and the CBD-infused sports performance line Provault™. Also included in the purchase is the Zola® brand of coconut water. Acquired assets include inventory, fixed assets, trademarks and domain names. The total purchase price for the assets is $4.0 million in cash and 827,400 shares of Arcadia common stock.

ITEM 2. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

Special Note Regarding Forward-Looking Statements

The following discussion and analysis of our financial condition and results of operations should be read in conjunction with our unaudited condensed consolidated financial statements and the related notes to those statements included herein. In addition to historical financial information, this report contains forward-looking statements that involve risks and uncertainties. Our actual results could differ materially from those discussed in the forward-looking statements. The statements contained in this report that are not purely historical are forward-looking statements within the meaning of Section 27A of the Securities Act and Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act. Forward-looking statements are often identified by the use of words such as, but not limited to, "anticipate," "believe," "can," "continue," "could," "estimate," "expect," "intend," "may," "plan," "project," "seek," "should," "strategy," "target," "will," "would" and similar expressions or variations intended to identify forward-looking statements. These statements are based on the beliefs and assumptions of our management based on information currently available to management. Such forward-looking statements are subject to risks, uncertainties and other important factors that could cause actual results and the timing of certain events to differ materially from future results expressed or implied by such forward-looking statements. Factors that could cause or contribute to such differences include, but are not limited to, those identified below and those discussed in the section titled "Risk Factors" included in the most recent Annual Report on Form 10-K filed by the Company. Furthermore, such forward-looking statements speak only as of the date of this report. Except as required by law, we undertake no obligation to update any forward-looking statements to reflect events or circumstances after the date of such statements.

Solely for convenience, the trademarks, service marks and trade names referred to in this report may appear without the ®, TM, or SM symbols, but such references do not constitute a waiver of any rights that might be associated with the respective trademarks, service marks, or trade names.

Overview

We are a leader in science-based approaches to developing high value crop improvements primarily in wheat, hemp and soy, designed to enhance farm economics by improving the performance of crops in the field, as well as their value as food ingredients, health and wellness products, and their viability for industrial applications. We have used advanced breeding techniques to develop these proprietary innovations which we are now commercializing through the sales of seed and grain food ingredients and products, hemp extracts, trait licensing and royalty agreements.

Our commercial strategy is to satisfy consumer nutrition, health and wellness demands with the superior functional benefits our crops deliver directly from the farm, enabling us to share premium economics throughout the ag-food supply chain and to build a world-class estate of high value traits and varieties.

According to ResearchandMarkets.com, the global wheat flour market in 2019 totaled $181 billion and is expected to reach $220 billion by 2027. It is also estimated by the U.S. Department of Agriculture ("USDA"), that approximately one-quarter of the FDA recommended calories consumed by people in the US are from wheat. Therefore, the market opportunity for nutritional improvements in wheat are significant not only because the wheat market itself is vast, but also because of the "share of stomach" wheat represents. Considering that most people today are not getting enough fiber or protein in their daily diets, the superior nutrient density of our non-GM GoodWheat™ ("GoodWheat") technology can improve the dietary intake of average consumers, by increasing their fiber and protein consumption without changing the way they eat. We believe this proprietary advantage gives GoodWheat the potential to become a global standard in wheat.

We also believe the recent legalization of hemp in the U.S. and many other areas of the world has created a significant agricultural and financial opportunity that we can participate in meaningfully. The market has demonstrated broad demand for industrial, nutritional, health and wellness products from hemp, yet the genetics have not yet been optimized for industrial scale production, which provides Arcadia with new opportunities to add value to the industry through seed and extract offerings.

The passage of the U.S. Agriculture Improvement Act of 2018 – also known as the Farm Bill – confirmed the federal legalization of hemp, the term given to non-psychoactive cannabis containing less than 0.3% tetrahydrocannabinol (THC). It also included provisions for legalizing on a federal level hemp's cultivation, transport and sale for the first time in more than 75 years. Hemp, not previously distinguished by the federal government from cannabis, a Schedule 1 drug and banned as an agricultural crop, lacks substantive plant biology research and is limited by suboptimal genetics, highly fragmented germplasm and performance inconsistencies. We are targeting hemp-based solutions that allow farmers to reliably and consistently achieve compliance with USDA regulations, through varieties with improved functionality and application of specific attributes such as select cannabinoid contents for health and wellness, enhanced proteins profiles for plant-based dietary applications and industrial applications such as clothing and hempcrete. Arcadia conducts its business in only federal and state markets in which its activities are legal.

In addition to bringing new hemp varieties to market, we also see an attractive opportunity to service the growing consumer demand for Cannabidiol ("CBD") and other hemp-derived cannabinoids. CBD is a naturally occurring compound found in the resinous flower of cannabis, a plant with a rich history as a medicine going back thousands of years. Today the therapeutic properties of CBD are being tested and confirmed by scientists and doctors around the world. According to a New Frontier Data report issued in March 2020, U.S. consumer spending on CBD is projected to grow from an estimated $14B USD in 2020 to $26B USD in 2025 with global demand accelerating significantly as countries formalize regulatory frameworks for the industry. Backed by our own consumer survey data, we believe our premium Hawaiian grown hemp provides a unique value proposition to consumers that will enable us to rapidly gain traction in the marketplace as we grow our B2B and branded retail business channels.

Arcadia GoodWheat™

In 2018, we launched our GoodWheat brand, a non-genetically modified (non-GM) portfolio of wheat products that enables food manufacturers to differentiate their consumer-facing brands. Consumer food companies are looking to simplify their food ingredient formulations and consumers are demanding "clean labeling" in their foods, paying more for foods having fewer artificial ingredients and more natural, recognizable and healthy ingredients. A 2017 survey by PR agency Ingredient Communications found that 73% of consumers are happy to pay a higher retail price for a food or drink product made with ingredients they recognize. Because GoodWheat increases the nutrient density directly in the primary grains and oils, it provides the mechanism for food formulation simplification naturally and cost effectively to meet evolving consumer demands.

The brand launch is a key element of the company's go-to-market strategy to achieve greater value for its innovations by participating in downstream consumer revenue opportunities. We designed the brand to make an immediate connection with consumers that products made with GoodWheat meet their demands for healthier wheat options that also taste great. The GoodWheat brand encompasses our current and future non-GM wheat portfolio of high fiber Resistant Starch (RS) and Reduced Gluten wheat varieties, as well as future wheat innovations. In October 2019, the U.S. Patent and Trademark Office granted us the latest patents for extended shelf life wheat, the newest trait in our non-genetically modified wheat portfolio. This new trait was designed to promote whole wheat consumption by improving the shelf life and taste of whole grain wheat products.

With additional patents granted in 2020 we now hold more than 15 global patents on our high fiber Resistant Starch wheat, protecting both bread wheat and durum (pasta) wheat. Claims granted recently strengthen our intellectual property for our Resistant Starch portfolio of products.

We announced in August 2019 an agreement with Bay State Milling Company and Arista Cereal Technologies to bring to market our resistant starch GoodWheat in North America and other key markets, beginning in late 2019. In the daily American diet approximately 500 calories come from wheat products, 25% of the FDA's recommended daily caloric intake for a woman and 20% for a man. The GoodWheat portfolio of specialty wheat varieties deliver new functional value through an ingredient already an important component of the human diet.

Arcadia GoodHemp™

In December 2019, we announced the launch of a new product line, GoodHemp, as the company's new commercial brand for delivering hemp seeds, transplants, flower and extracts. The acquisition of Industrial Seed Innovations ("ISI") in August 2020 brought ISI's portfolio of strong performing, federally compliant hemp varieties to Arcadia's GoodHemp™ catalog. ISI's popular Umpqua and Rogue seed varieties each bring unique and highly desirable characteristics to further differentiate Arcadia's GoodHemp catalog. We have since introduced another variety, Santiam, to the market, and have built a pipeline that is expected to deliver new commercial varieties on an annual basis.

By 2025, the Brightfield Group, a hemp and CBD market research firm, projects U.S. sales of hemp-based CBD to reach $16.8 billion. Additionally, Markets and Markets estimates the non-cannabinoid, industrial hemp global market will exceed $26 billion by 2025.

Archipelago Ventures Hawaii, LLC

In August 2019, we formed a new joint venture to serve the Hawaiian, North American and Asian hemp markets, Archipelago Ventures Hawaii, LLC (“Archipelago”). This new venture between Arcadia and Legacy Ventures Hawaii (“Legacy”) combines Arcadia’s extensive genetic expertise and seed innovation history with Legacy’s growth capital and strategic advisory expertise in the Hawaiian markets. Additionally, Legacy brings to the partnership years of proven success in extraction, product formulation and sales of cannabinol oil and distillate products through its equity partner, Vapen CBD. Legacy was originally formed to be a vehicle for its partners to pursue hemp opportunities within the Hawaiian Islands. Legacy’s primary role within Archipelago is to build world class cGMP extraction facilities to allow Hawaiian farmers an outlet for maximizing their profits growing and converting hemp to high grade CBD, as well as other high-value compounds. Legacy’s equity partner, Vapen CBD, is a wholly owned subsidiary of VEXT which is a publicly traded cannabis operator based in Phoenix, Arizona listed on both the Canadian and Frankfurt exchanges.

Archipelago creates a vertically integrated supply chain, from seed to sale, we believe the first of its kind in Hawaii, and has three important strategic imperatives: (1) ensure a reliable supply chain during critical scale up of the global hemp market, a major risk mitigation for success, (2) ensure high quality throughout the supply chain, from genetics to the field and field to the customer and (3) ensure being well-positioned to address the unique opportunities related to market for Hawaiian grown hemp.

Verdeca HB4® Soybean

In 2012, we partnered with Bioceres, Inc. (“Bioceres”) an Argentina-based technology company, to form Verdeca LLC, (“Verdeca”) a U.S.-based joint venture company to deploy next-generation soybean traits developed to benefit soybean producers through quality improvement, stress mitigation and management practices. The HB4® soybean varieties deliver two layers of value for growers: drought and herbicide tolerance, offering resistance to a broad-spectrum herbicide utilized to prevent growth of a wide range of annual and perennial broadleaf weeds and grasses. In November 2020, we sold our membership interest in Verdeca to Bioceres in a transaction in which we received cash, shares of Bioceres stock and a royalty stream of up to $10 million on HB4 soybean sales. An additional $2 million in cash is to be paid upon achievement by Verdeca of specific regulatory or commercial milestones.

Impact of COVID-19

In early 2020, the World Health Organization ("WHO") determined the coronavirus ("COVID-19") was a worldwide pandemic. We are closely monitoring how the spread of the new strains of coronavirus are affecting our employees and business operations. We have developed preparedness plans to help protect the safety of our employees while safely continuing business operations. While management currently expects the impact of COVID-19 to be temporary, there is uncertainty around the duration and its broader impact on the economy and therefore the effects it will have on the Company’s financial condition, liquidity, operations, suppliers, industry, and workforce.

Components of Our Statements of Operations Data

Revenues

We derive our revenues from product revenues, royalties, license revenues and contract research agreements. Given our acute focus on selling our GoodWheat and GoodHemp products, we do not intend to continue pursuing contract research agreements and government grant projects.

Product Revenues

Our product revenues to date have consisted primarily of sales of our SONOVA products, and GoodWheat grain sales. We recognize revenue from product sales when control of the product is transferred to third-party distributors and manufacturers, collectively “our customers,” which generally occurs upon shipment. Our revenues fluctuate depending on the timing of shipments of product to our customers.

License Revenues

Our license revenues to date consist of up-front, nonrefundable license fees, annual license fees, and subsequent milestone payments that we receive under our research and license agreements. Revenue generated from up-front license fees are recognized upon execution of the agreement. We recognize annual license fees when it is probable that a material reversal will not occur.

Milestone fees are variable consideration that is initially constrained and recognized only when it is probable that such amounts would not be reversed. The Company assesses when achievement of milestones are probable in order to determine the timing of revenue recognition for milestone fees. Milestones typically consist of significant stages of development for our traits in a potential commercial product, such as achievement of specific technological targets, completion of field trials, filing with regulatory agencies, completion of the regulatory process, and commercial launch of a product containing our traits. Given the seasonality of agriculture and time required to progress from one milestone to the next, achievement of milestones is inherently uneven, and our license revenues are likely to fluctuate significantly from period to period.

Royalty Revenues

Our royalty revenues consist of amounts earned from the sale of commercial products that incorporate our traits by third parties. Our royalty revenues consist of a minimum annual royalty, offset by amounts earned from the sale of products. We recognize the minimum annual royalty on a straight-line basis over the year, and we recognize royalty revenue resulting from the sale of products when the third parties transfer control of the product to their customers, which generally occurs upon shipment. Our royalty revenues can fluctuate depending on the timing of shipments of product by the third parties to their customers.

Contract Research and Government Grant Revenues

Contract research and government grant revenues consist of amounts earned from performing contracted research primarily related to breeding programs or the genetic engineering of plants for third parties. Contract research revenue is accounted for as a single performance obligation for which revenues are recognized over time using the input method (e.g., costs incurred to date relative to the total estimated costs at completion).

Operating Expenses

Cost of Product Revenues

Cost of product revenues relates to the sale of our SONOVA and GoodWheat products and consists of in-licensing and royalty fees, any adjustments or write-downs to inventory or prepaid production costs, as well as the cost of raw materials, including internal and third-party services costs related to procuring, processing, formulating, packaging and shipping our products.

Research and Development Expenses

Research and development expenses consist of costs incurred in the discovery, development and testing of our products and products in development incorporating our traits. These expenses consist primarily of employee salaries and benefits, fees paid to subcontracted research providers, fees associated with in-licensing technology, land leased for field trials, chemicals and supplies, and other external expenses. These costs are expensed as incurred. Additionally, we are required from time to time to make certain milestone payments in connection with the development of technologies in-licensed from third parties. Our research and development expenses may fluctuate from period to period.

Selling, General and Administrative Expenses

Selling, general and administrative expenses consist primarily of employee costs, professional service fees, and overhead costs. Our selling, general, and administrative expenses may fluctuate from period to period. In connection with our commercialization activities for our hemp seed and consumer ingredient products, we expect to increase our investments in sales and marketing and business development.

Change in Fair Value of Contingent Consideration

Change in the fair value of contingent consideration is comprised of the fair value remeasurement of the liabilities associated with our contingent consideration.

Write-down of fixed assets

Write-down of fixed assets includes losses from tangible assets due to impairment or recoverability test charges to adjust fixed assets to their fair value or recoverability value.

Interest Expense

Interest expense consists primarily of contractual interest on notes payable relating to the purchase of company vehicles, the revolving line of credit and the Paycheck Protection Loan.

Other Income, Net

Other income, net, consists of unrealized gains on corporate securities, interest income and the amortization of investment premium and discount on our cash and cash equivalents and investments.

Issuance and offering costs

Issuance and offering costs generally include placement agent, legal, advisory, accounting and filing fees related to financing transactions.

Change in the Estimated Fair Value of Common Stock Warrant Liabilities

Change in the estimated fair value of common stock warrant liabilities is comprised of the fair value remeasurement of the liabilities associated with our financing transactions.

Income Tax Provision

Our income tax provision has not been historically significant, as we have incurred losses since our inception. The provision for income taxes consists of state and foreign income taxes. Due to cumulative losses, we maintain a valuation allowance against our U.S. deferred tax assets as of March 31, 2021 and December 31, 2020. We consider all available evidence, both positive and negative, including but not limited to, earnings history, projected future outcomes, industry and market trends and the nature of each of the deferred tax assets in assessing the extent to which a valuation allowance should be applied against our U.S. deferred tax assets.

Results of Operations

Comparison of the Three Months Ended March 31, 2021 and 2020

	Three Months Ended March 31, 2021	2020	$ Change	% Change
	(In thousands except percentage)			
Revenues:				
Product	$ 803	$ 154	$ 649	421%
License	—	100	(100)	(100)%
Royalty	25	30	(5)	(17)%
Contract research and government grants	—	25	(25)	(100)%
Total revenues	828	309	519	168%
Operating expenses:				
Cost of product revenues	856	132	724	548%
Research and development	1,159	2,244	(1,085)	(48)%
Change in fair value of contingent consideration	(140)	—	(140)	(100)%
Write-down of fixed assets	210	—	210	100%
Selling, general and administrative	4,069	3,723	346	9%
Total operating expenses	6,154	6,099	55	1%
Loss from operations	(5,326)	(5,790)	464	(8)%
Interest expense	(9)	(3)	(6)	183%
Other income, net	7,463	72	7,391	10265%
Issuance and offering costs	(769)	—	(769)	(100)%
Change in fair value of common stock warrant liabilities	322	8,161	(7,839)	(96)%
Net income before income taxes	1,681	2,440	(759)	(31)%
Income tax provision	—	(17)	17	(100)%
Net income	1,681	2,423	(742)	(31)%
Net loss attributable to non-controlling interest	(377)	(102)	(275)	269%
Net income attributable to common stockholders	$ 2,058	$ 2,525	$ (467)	(19)%

Revenues

Product revenues accounted for 97% and 50% of our total revenues in the three months ended March 31, 2021 and 2020, respectively. The $649,000, or 421%, increase in product revenues for the three months ended March 31, 2021 compared to the same period in 2020 was primarily driven by sales of GoodWheat and additional volume of SONOVA pet food orders.

License revenues accounted for 0% and 32% of our total revenues in the three months ended March 31, 2021, and 2020, respectively. The $100,000 in license revenues for the three months ended March 31, 2020 was due to the achievement of certain milestones.

Royalty revenues accounted for 3% and 10% of our total revenues in the three months ended March 31, 2021 and 2020, respectively. The $25,000 of royalty revenues for the three months ended March 31, 2021 represents the proportionate share of contracted minimum annual royalty fees.

Contract research and government grant revenues accounted for 0% and 8% of our total revenues for the three months ended March 31, 2021 and 2020, respectively. Our contract research and government grant revenues decreased by $25,000, or 100%, in the three months ended March 31, 2021 compared to the same period in 2020. The decrease was driven by the completion of agreements and grants during 2020. Given our acute focus on selling our GoodWheat and GoodHemp products, we do not intend to continue pursuing contract research agreements and government grant projects.

Cost of Product Revenues

Cost of product revenues increased by $724,000, or 548%, in the three months ended March 31, 2021 compared to the same period in 2020. The increase is in line with the higher sales of GoodWheat and of SONOVA GLA, and also partially due to a $160,000 write-down of hemp seed inventory.

Research and Development

Research and development expenses decreased by $1,085,000, or 48%, in the three months ended March 31, 2021 compared to the same period in 2020. The decrease was primarily driven by the Company pivoting its focus to commercialization, which led to lower employee-related expenses as we right-sized our research teams.

Selling, General, and Administrative

Selling, general, and administrative expenses increased by $346,000, or 9%, in the three months ended March 31, 2021 compared to the same period in 2020. The increase was primarily driven by higher employee-related expenses, increased commercial and marketing activities, partially offset by lower consulting-related stock compensation expense.

Change in fair value of contingent consideration

During the quarter ended March 31, 2021, the change in the fair value of contingent consideration was due to the ISI contingent consideration remeasurement that resulted in a decrease of the liability in the amount of $140,000. There was no change in fair value of contingent consideration during the quarter ended March 31, 2020.

Write-down of fixed assets

We assessed Archipelago's fixed assets related to CBD processing for impairment and recorded a write-down in the amount of $210,000 for the quarter ended March 31, 2021. There were no such impairments during the three months ended March 31, 2020. See Note 4.

Other Income, Net

Other income, net increased by $7,391,000, or 10265%, in the three months ended March 31, 2021 when compared to the same period in 2020. This was primarily due to the unrealized gain resulting from the increase in the stock price from December 31, 2020 to March 31, 2020 of the shares of BIOX stock held.

Issuance and offering costs

Offering costs increased by $769,000 for the three months ended March 31, 2021, and comprised of the placement agent fees, placement agent warrants, and legal and accounting fees related to the January 2021 PIPE financing transaction. There were no issuance and offering costs for the three months ended March 31, 2020.

Change in the Estimated Fair Value of Common Stock Warrant Liabilities

Change in the estimated fair value of common stock warrant liabilities resulted in income of $322,000 for the three months ended March 31, 2021, due to the fair value remeasurement of the common stock warrant liabilities driven by an increase in the risk-free rates and volatility compared to December 31, 2020.

Income Tax Expense

Income tax expense for the three months ended March 31, 2021 of $0 slightly decreased when compared to the expense of $17,000 recorded for the three months ended March 31, 2020.

Seasonality

We and our commercial partners operate in different geographies around the world and conduct field trials used for data generation, which must be conducted during the appropriate growing seasons for particular crops and markets. Often, there is only one crop-growing season per year for certain crops and markets. Similarly, climate conditions and other factors that may influence the sales of our products may vary from season to season and year to year. In particular, weather conditions, including natural disasters such as heavy rains, hurricanes, hail, floods, tornadoes, freezing conditions, drought, or fire, may affect the timing and outcome of field trials, which may delay milestone payments and the commercialization of products incorporating our seed traits. Sales of commercial products that incorporate our seed traits will vary based on crop growing seasons and weather patterns within particular regions.

Liquidity, Capital Resources, and Going Concern

We have funded our operations primarily with the net proceeds from the sale of our securities and incurring debt, as well as from the sale of our SONOVA and GoodWheat products and payments under license agreements, contract research agreements and government grants. Our principal use of cash is to fund our operations, which are primarily focused on completing development and commercializing our quality seed traits. This includes scaling harvest production of wheat, hemp and soy, as well as coordinating with our partners on their development programs. As of March 31, 2021, we had cash and cash equivalents of $32.8 million. For the three months ended March 31, 2021, the Company had net income of $1.7 million and net cash used in operations of $4.7 million. For the twelve months ended December 31, 2020, the Company had net losses of $6.0 million and net cash used in operations of $30.2 million.

We believe that our existing cash and cash equivalents will be sufficient to meet our anticipated cash requirements for at least the next 12 months. See Note 1 of the notes to the condensed consolidated financial statements for more information.

As is disclosed in Notes 11 and 12, on January 25, 2021, the Company entered into a securities purchase agreement with certain institutional and accredited investors relating to the issuance and sale in a private placement of shares of Company common stock and warrants for an aggregate of $25.1 million, exclusive of any related transaction fees.

We may seek to raise additional funds through debt or equity financings. We may also consider entering into additional partner arrangements. The sale of additional equity would result in dilution to the Company’s stockholders. The incurrence of debt would result in debt service obligations, and the instruments governing such debt could provide for additional operating and financing covenants that would restrict operations. If the Company does require additional funds and is unable to secure adequate additional funding at terms agreeable to the Company, we may be forced to reduce spending, extend payment terms with suppliers, liquidate assets, or suspend or curtail planned development programs. Any of these actions could materially harm the business, results of operations and financial condition.

Cash Flows

The following table summarizes our cash flows for the periods indicated (in thousands):

	Three Months Ended March 31, 2021	Three Months Ended March 31, 2020
Net cash (used in) provided by:		
Operating activities	$ (4,707)	$ (9,270)
Investing activities	(485)	13,130
Financing activities	21,997	696
Net increase in cash	$ 16,805	$ 4,556

Cash flows from operating activities

Cash used in operating activities for the three months ended March 31, 2021, was $4.7 million. Our net income of $1.7 million, non-cash charges including $325,000 of stock-based compensation, $289,000 of lease amortization, and $236,000 of depreciation were offset by adjustments in our working capital accounts of $200,000, by $7.5 million of unrealized gain on corporate securities, other non-cash income from the change in fair value of common stock warrant liabilities of $322,000, and operating lease payments of $272,000.

Cash used in operating activities for the three months ended March 31, 2020 was $9.3 million. Our net income of $2.4 million reflects adjustments in our working capital accounts of $4.4 million, non-cash income from the change in fair value of common stock warrant liabilities of $8.2 million, operating lease payments of $184,000, and amortization of investment premium of $39,000, partially offset by non-cash charges including $772,000 of stock-based compensation, $223,000 of lease amortization, and $74,000 of depreciation.

Cash flows from investing activities

Cash used in investing activities for the three months ended March 31, 2021 consisted of $485,000 in purchases of property and equipment.

Cash provided by investing activities for the three months ended March 31, 2020 consisted of $15.2 million in proceeds from sales and maturities of investments, which were offset by $1.3 million in purchases of short-term investments and $778,000 in purchases of property and equipment.

Cash flows from financing activities

Cash provided by financing activities for the three months ended March 31, 2021 consisted of proceeds from the issuance of common stock relating to the January 2021 PIPE financing transaction of $25.1 million gross proceeds, capital contributions from the non-controlling interest in our joint venture of $750,000, and proceeds from the purchase of ESPP shares of $21,000, which were offset by payments of transaction costs related to the January 2021 PIPE of $1.1 million and principal payments on debt of $2.0 million.

Cash provided by financing activities for the three months ended March 31, 2020 consisted of capital contributions from the non-controlling interest in our joint venture of $689,000 and proceeds from the purchase of ESPP shares of $14,000, which were offset by principal payments on notes payable of $7,000.

Off-Balance Sheet Arrangements

Since our inception, we have not engaged in any off-balance sheet arrangements, including the use of structured finance, special purpose entities, or variable interest entities other than Verdeca, which has been disposed of in November 2020.

Critical Accounting Policies and Estimates

Our management's discussion and analysis of our financial condition and results of operations is based on our condensed consolidated financial statements, which have been prepared in accordance with GAAP. The preparation of these condensed consolidated financial statements requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the condensed consolidated financial statements, as well as the reported revenue generated, and expenses incurred during the reporting periods. Our estimates are based on our historical experience and on various other factors that we believe are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying value of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions.

We consider our critical accounting policies and estimates to be revenue recognition, determination of the provision for income taxes, stock-based compensation, fair value of certain equity instruments, and net realizable value of inventory. See Notes 5, 11 and 12 for the estimates made in connection with the securities purchase agreements executed during 2018, 2019, 2020 and 2021.

ITEM 3: QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Not Required.

ITEM 4: CONTROLS AND PROCEDURES

Evaluation of Disclosure Controls and Procedures

We maintain "disclosure controls and procedures," as such term is defined in Rule 13a-15(e) under the Securities Exchange Act of 1934, or Exchange Act, that are designed to ensure that information required to be disclosed by us in reports that we file or submit under the Exchange Act is recorded, processed, summarized, and reported within the time periods specified in Securities and Exchange Commission rules and forms, and that such information is accumulated and communicated to our management, including our President and Chief Executive Officer and our Chief Financial Officer, as appropriate, to allow timely decisions regarding required disclosure. In designing and evaluating our disclosure controls and procedures, management recognized that disclosure controls and procedures, no matter how well conceived and operated, can provide only reasonable, not absolute, assurance that the objectives of the disclosure controls and procedures are met. Our disclosure controls and procedures have been designed to meet reasonable assurance standards. Additionally, in designing disclosure controls and procedures, our management necessarily was required to apply its judgment in evaluating the cost-benefit relationship of possible disclosure controls and procedures. The design of any disclosure controls and procedures also is based in part upon certain assumptions about the likelihood of future events, and there can be no assurance that any design will succeed in achieving its stated goals under all potential future conditions.

Based on their evaluation as of the end of the period covered by this Quarterly Report on Form 10-Q, our President and Chief Executive Officer and our Chief Financial Officer have concluded that, as of such date, our disclosure controls and procedures were effective at the reasonable assurance level.

Changes in Internal Control over Financial Reporting

There were no changes in our internal control over financial reporting (as such term is defined in Rule 13a-15(f) under the Exchange Act) identified in connection with the evaluation identified above that occurred during the quarter ended March 31, 2021 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

PART II. OTHER INFORMATION

ITEM 1. LEGAL PROCEEDINGS

We currently are not a party to any material litigation or other material legal proceedings. From time to time, we may be subject to legal proceedings and claims in the ordinary course of business.

ITEM 1A. RISK FACTORS

In addition to the other information set forth in this Quarterly Report, you should carefully consider the factors discussed in Part I, “Item 1A. Risk Factors” in our Annual Report on Form 10-K for the year ended December 31, 2020, which could materially affect our business, financial condition, liquidity or future results. The risks described in our Annual Report on Form 10-K are not the only risks facing our company. Additional risks and uncertainties not currently known to us or that we currently deem to be immaterial also may materially adversely affect our business, financial condition, liquidity or future results.

ITEM 2. UNREGISTERED SALES OF EQUITY SECURITIES AND USE OF PROCEEDS

During the three months ended March 31, 2021, we issued the securities described below without registration under the Securities Act. Unless otherwise indicated below, the securities were issued pursuant to the private placement exemption provided by Section 4(a)(2) of the Securities Act.

On January 15, 2021, we issued a warrant to an independent contractor entity to purchase up to 7,500 shares of our common stock. The warrant has an exercise price per share of $3.08 and a term of 2 years.

On January 25, 2021, we entered into a securities purchase agreement with certain institutional and accredited investors relating to the issuance and sale in a private placement of 7,876,784 shares of common stock at a purchase price of $3.1925 per share and warrants exercisable for an aggregate of 3,938,392 shares of common stock with an exercise price of $3.13 per share. Subject to certain ownership limitations, the warrants are exercisable upon issuance and will expire on the 5.5 year anniversary of the date of issuance. In connection with the private placement, we granted to a placement agent warrants to purchase a total of 393,839 shares of common stock that have an exercise price per share equal to $3.99 and a term of five years from the date of issuance.

ITEM 3. DEFAULTS UPON SENIOR SECURITIES

None.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

ITEM 5. OTHER INFORMATION

On May 16, 2021, Arcadia Biosciences, Inc. provided notice to Randy Shultz of the elimination of the chief technology officer position at the company, a role in which he had been serving. The effective date of Mr. Shultz’s final day of employment is May 21, 2021.

ITEM 6. EXHIBITS

The following exhibits are attached hereto or are incorporated herein by reference.

Exhibit Number	Exhibit Description
4.1(1)	Form of New Warrant issued on January 28, 2021.
4.2(2)	Form of Placement Agent Warrant issued on January 28, 2021.
10.1(3)	Securities Purchase Agreement dated as of January 25, 2021.
10.2(4)	Registration Rights Agreement made as of January 25, 2021.
31.1	Principal Executive Officer's Certifications Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
31.2	Principal Financial Officer's Certifications Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
32.1(5)	Certification Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
32.2(5)	Certification Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
101.INS	XBRL Instance Document
101.SCH	XBRL Taxonomy Extension Schema Document
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document
101.LAB	XBRL Taxonomy Extension Label Linkbase Document
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document

(1) Incorporated by reference to Exhibit 4.1 filed with the Report on Form 8-K filed on January 29, 2021.
(2) Incorporated by reference to Exhibit 4.2 filed with the Report on Form 8-K filed on January 29, 2021.
(3) Incorporated by reference to Exhibit 10.1 filed with the Report on Form 8-K filed on January 29, 2021.
(4) Incorporated by reference to Exhibit 10.2 filed with the Report on Form 8-K filed on January 29, 2021.
(5) This certification is deemed not filed for purpose of Section 18 of the Exchange Act or otherwise subject to the liability of that section, nor shall it be deemed incorporated by reference into any filing under the Securities Act or the Exchange Act.

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned thereunto duly authorized.

	Arcadia Biosciences, Inc.
May 17, 2021	By: /s/ MATTHEW T. PLAVAN Matthew T. Plavan President and Chief Executive Officer
May 17, 2021	By: /s/ PAMELA HALEY Pamela Haley Chief Financial Officer

Exhibit 31.1

CERTIFICATION OF CHIEF EXECUTIVE OFFICER
PURSUANT TO EXCHANGE ACT RULE 13a-14(a)/15d-14(a)
AS ADOPTED PURSUANT TO SECTION 302
OF THE SARBANES-OXLEY ACT OF 2002

I, Matthew T. Plavan, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Arcadia Biosciences, Inc. for the period ended March 31, 2021;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Dated: May 17, 2021

/s/ MATTHEW T. PLAVAN
Matthew T. Plavan
President and Chief Executive Officer
(Principal Executive Officer)

Exhibit 31.2

CERTIFICATION OF CHIEF FINANCIAL OFFICER
PURSUANT TO EXCHANGE ACT RULE 13a-14(a)/15d-14(a)
AS ADOPTED PURSUANT TO SECTION 302
OF THE SARBANES-OXLEY ACT OF 2002

I, Pamela Haley, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Arcadia Biosciences, Inc. for the period ended March 31, 2021;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Dated: May 17, 2021

/s/ PAMELA HALEY
Pamela Haley
Chief Financial Officer
(Principal Financial Officer)

Exhibit 32.1

CERTIFICATION
PURSUANT TO 18 U.S.C. SECTION 1350
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the accompanying Quarterly Report of Arcadia Biosciences, Inc. (the “Company”), on Form 10-Q for the quarter ended March 31, 2021 (the “Report”), I, Matthew T. Plavan, President and Chief Executive Officer of the Company, hereby certify pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002 that:

(1) the Report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Dated: May 17, 2021

/s/ MATTHEW T. PLAVAN
Matthew T. Plavan
President and Chief Executive Officer
(Principal Executive Officer)

Exhibit 32.2

**CERTIFICATION
PURSUANT TO 18 U.S.C. SECTION 1350
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002**

In connection with the accompanying Quarterly Report of Arcadia Biosciences, Inc. (the “Company”), on Form 10-Q for the quarter ended March 31, 2021 (the “Report”), I, Pamela Haley, Chief Financial Officer of the Company, hereby certify pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002 that:

(1) the Report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Dated: May 17, 2021

/s/ PAMELA HALEY
Pamela Haley
Chief Financial Officer
(Principal Financial Officer)