Study conducted at Walden Heights Nursery Orchard Walden, VT 2021

Results by malic acid

Cultings	malic acid
Cultivar	g/L
wodarz	1.88
beautiful arcade	2.43
Niedzwetzkyana	2.45
crab 128	2.59
croncels	2.59
golden lights	2.68
priscilla	3.35
gingergold	3.37
norda	3.39
cortland	3.44
garland	3.57
hawaii	3.75
nova easygro	3.79
hazen	3.88
stone	3.88
vista bella	3.93
american beauty	3.97
dayton	4.04
norson	4.08
oriole	4.08
redfree	4.12
whitney	4.14
williams pride	4.16
harcourt	4.18
britemac	4.27
dudley winter	4.27
freedom	4.3
mac summerland red	4.39
walden golden	4.4
oxbo	4.44
peterson	4.44
snowsweet	4.51
macfree	4.52
redfree	4.54
sweet 16	4.55
wild - 79	4.55
bethel	4.62
hubbardston nonesuch	4.69
blue pearmain	4.7
niagara	4.71
reine de pomme	4.73
regent	4.81
carroll	4.86
lowland raspberry	4.89



This material is based upon work supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, through the Northeast Sustainable Agriculture Research and Education program under subaward number FNE20-960.

The Project Leader would like to express gratitude to study Technical Advisor, Terence Bradshaw (Research As.Professor, Dept of Plant & Soil Science, UVM) and the students at the University of Vermont Food Lab.

Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture.

Todd Parlo conducted this study and has worked in plant science for the past thirty years. His family established Walden Heights Nursery and Orchard (WHNO) twenty-five years ago, in Walden VT (US zone 3). WHNO includes a fruit tree arboretum of more than 600 distinct apple varieties, and includes thousands of established fruit trees, bushes and vines managed under certified organic practices, sustainable agriculture, and permaculture principles. The farm has a processing component and storage facility for cider production. WHNO is also a propagation-style nursery, producing stock for farm use and sales local retail and online. Additionally, WHNO offers consulting, educational workshops, and other services. www.WaldenHeightsNursery.com

Study conducted at Walden Heights Nursery Orchard Walden, VT 2021

Results by malic acid

	malic acid
Cultivar	g/L
malinda	4.9
red baron	4.95
westfield snf	4.95
norland	4.98
honeycrisp	5.06
burgundy	5.07
davey	5.07
noran	5.09
sunrise	5.11
two trunk bittercrab	5.13
36-305	5.19
green peak	5.19
opalescent	5.29
honeygold	5.3
black oxford	5.33
chenango strawberry	5.33
gruzhova of moscow	5.33
sweetcrab	5.37
purple mac	5.4
spartan	5.48
greensleeves	5.49
morden 359	5.52
greening	5.56
slovianka	5.56
marlin stephens	5.58
winter banana	5.58
breaky	5.66
mcintosh	5.78
lord lambourne	5.8
rouville	5.81
elstar	5.88
wild - rr 2	5.93
howgate wonder	5.96
smokehouse	5.97
dolgo 299	6
wealthy	6
erwin bauer	6.03
75414	6.04
75414	6.04
magog redstreak	6.05
novamac	6.05
antonovka 88	6.09
anaros	6.11
summerred	6.11
<u> </u>	1 0.11

Study conducted at Walden Heights Nursery Orchard Walden, VT 2021

Results by malic acid

Cultivar g/L yarlington mill 6.13 blue pearmain 6.16 equinox 6.17 mantet 6.17 antonovka 48 6.2 almata 6.21 shiawassee 6.24 shay 6.32 macoun 6.33 chestnut crab 6.35 75413 6.36 ozark gold 6.37 pound sweet 6.39 red wealthy 6.45 false yarlington 6.49 centennial 6.51 kitchell yellow 6.57 morden 363 6.59 red burke 6.59 chenango strawberry 6.61 keepsake 6.63 white pippin 6.64 dakota 6.72 autumn arctic 6.78 pomme gris 6.83 pomme gris 6.83 pomme gris 6.84 lobo 6.99 northwest greening		
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liberty 6.94 alexander 6.96 northwest greening 6.98 bud 490 6.99 haralred 7.02 amsib 7.04 wild -583 7.04 morden 7.06 severny sinap 7.06 audrey transparent 7.07 haralson 7.11 early harvest 7.19	golden russet	6.84
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severny sinap 7.06 audrey transparent 7.07 haralson 7.11 early harvest 7.19	morden	7.06
audrey transparent 7.07 haralson 7.11 early harvest 7.19	severny sinap	
haralson 7.11 early harvest 7.19		
early harvest 7.19		+
	early harvest	
1 7.20	antonovka 1.5	7.26

Study conducted at Walden Heights Nursery Orchard Walden, VT 2021

Results by malic acid

	I
Cultivos	malic acid
Cultivar	g/L
anisim	7.27
arlie's redflesh	7.31
arlie's redflesh	7.31
hewes crab	7.32
swayzie	7.32
bud 118	7.34
parkland	7.45
big red duchess	7.46
white pippin	7.49
wedge	7.53
74818	7.57
false freedom	7.62
island winter	7.65
bedford	7.69
cox's orange pippin	7.7
goldrush	7.75
prairie spy	7.79
ashmead's kernal	7.83
crab -341	7.86
fameuse	7.87
newt grindle	7.87
leo	7.97
fantazja	8.01
rogers red	8.08
columbia crab	8.09
frostbite	8.16
spencer	8.26
redfield	8.3
wolf river	8.49
no peace	8.72
citrus 932	8.83
ugly antonovka	8.99
hiburnal	9.03
columbia crab	9.16
wild - rr4	9.17
wild - rr10	9.36
milwaukee	9.47
gopher	9.51
wild - rr 8	9.58
hewesmata crab	9.68
crab - 835	9.95
atlas	10.23
redrock	10.23
wild - 308 -6	10.23
wiiu - 306 -0	10.23

Study conducted at Walden Heights Nursery Orchard Walden, VT 2021

Results by malic acid

	malic acid
Cultivar	g/L
stowe crab	10.31
empire	10.92
crab - gbr-21	10.97
redhook	11
ribston pippin	11.28
boiken	11.49
kazakh 761	12.1
hiburnal	12.24
crab - 542	12.35
scott winter	12.43
bedford	12.85
cinnamin	13.29
anoka	13.37
sakhi	13.37
crab - 821	14.04
white angel	16.14
crab soc-12	18.33
crab - bc101	26.97