North Dakota State University - Dickinson Research and Extension Center, Dickinson, ND

Colupulone as a percent of Alpha Acids	Cohumulone as a percent of Alpha Acids	Beta Acid Content (%)	Alpha Acid Content (%)	Colupulone as a percent of Alpha Acids	Cohumulone as a percent of Alpha Acids	Beta Acid Content (%)	Alpha Acid Content (%)	Variety of Hops	Yield in air-dried ounces			Number of plants harvested of each variety			Yield per harvested plant in air-dried ounces			2015-2017 average yield per plant in air dried ounces
2016	2016	2016	2016	2017	2017	2017	2017		2015	2016	2017	2015	2016	2017	2015	2016	2017	
60.60	35.90	5.28	7.80	63.90	42.40	3.50	3.47	Brewers Gold	16.5	25.5	5.4	3	3	3	5.5	8.5	1.8	5.3
47.90	30.20	2.90	3.46	46.90	31.90	1.42	0.79	Fuggle	4.5	11.3	1.7	3	3	3	1.5	3.8	0.6	1.9
63.10	37.70	10.10	15.10	59.70	36.40	7.43	8.06	Galena	9.0	22.5	2.9	3	3	2	3.0	7.5	1.5	4.0
32.90	12.10	6.96	4.61	-	-	-	-	Glacier	1.8	9.2	0.6	1	3	2	1.8	3.1	0.3	1.7
47.60	26.00	2.47	3.45	-	-	-	-	Golding	1.9	4.8	0.0	2	3	0	1.0	1.6	0.0	0.9
47.10	30.10	2.77	3.05	-	-	-	-	Hallertau	3.6	3.9	0.2	2	3	1	1.8	1.3	0.2	1.1
37.80	22.40	8.02	14.40	-	-	-	-	Magnum	4.9	6.9	0.6	2	3	1	2.5	2.3	0.6	1.8
46.00	25.10	2.19	2.72	-	-	-	-	Mt. Hood	1.1	1.5	0.0	2	1	0	0.6	1.5	0.0	0.7
59.50	34.40	8.30	11.00	-	-	-	-	Newport	4.2	15.7	0.5	3	3	2	1.4	5.2	0.3	2.3
								Averages	5.3	11.3	1.3	2.3	2.8	1.6	2.1	3.9	0.6	

Alpha acids produce desireable bitterness when boiled in wort before the wort is cooled and fermented into beer.
Beta acids lend a more harsh bitterness during conditioning and storage of beer than the bitterness of alpha acids.
Hops with low cohumulone levels (making up <25% of alpha acids) are thought to attribute a smoother bitterness in the finished beer.
Hops with high colupulone (a beta acid) levels are thought to attribute a harsh bitterness produced during the aging of beer.