

Hop Variety	Alpha %	Possible Substitutes
Admiral (U.K.)	13.5-16%	U.K. Challenger, U.K. Northdown, U.K. Target
Ahtanum™ (Brand YCR 1 cv.)	4-6.3%	Amarillo, Centennial, Simcoe, Cascade
Amarillo® (VGXP01)	8-9%	Cascade, Centennial, Simcoe, Ahtanum
Apollo (US)	15-19%	Magnum, Zeus
Aramis (French)	7.5-8.5%	Centennial, Chinook, Tettnang
Belma (U.S.)	12.10%	
Bitter Gold (U.S.)		
Boadicea (U.K.)	8-9%	
Bramling Cross (U.K.)	5-7%	U.K. Kent Golding, U.K. Progress, Whitbread Golding Variety
Bravo (Hopsteiner 0146) (U.S.)	14-17%	Columbus, Apollo, Zeus
Brewer's Gold (U.S.)	7-10%	Chinook, Galena, Nugget
Brewer's Gold (German)	6-7%	Bullion, Galena, Northdown, Northern Brewer
Bullion (U.K.)	6.5-9%	Columbus, Northern Brewer, German Brewer's Gold
Calypso (U.S.)	12-14%	
Cascade (U.S.)	4.5-7%	Centennial, Amarillo, possibly Columbus
Cascade (Argentina)	3-5%	Any noble hops
Cascade (New Zealand)	6-8%	Ahtanum, Cascade, Centennial
Cashmere (U.S.)		
Centennial (U.S.)	8-11.5%	Amarillo, Cascade, Columbus, Summit
Challenger (U.K.)	6.5-8.5%	Northern Brewer, U.S. or German Perle
Chelan (U.S.)		
Chinook (U.S.)	10-14%	Brewers Gold, Columbus, Galena, Nugget, Northern Brewer, Eroica
Citra® (Brand YCR 394 cv.) (U.S.)	11-13%	
Cluster (U.S.)	5.5-8.5%	Galena, Eroica
Columbia (U.S.)	7-11%	Fuggie
Columbus (U.S.)	11-16%	Magnum, Chinook, Northern Brewer, Warrior, Millenium, Bullion
Comet (U.S.)	9.5-12.5%	Galena
Crystal (U.S.)	2-4.5%	Mt. Hood, Liberty, Hallertauer, Tettnanger, Strisselspalt
Dr. Rudi (New Zealand)	10-12%	Super Alpha NZ
El Dorado (U.S.)	14-16%	
Ella (Australia)	13.3-16.3%	
Equinox™ (HBC 366 cv.) (U.S.)		
Eroica (German)	9-12%	Chinook, Galena, Nugget
Eroica (U.S.)	7.3-14.9%	Brewers Gold, Bullion, Galena, Glacier
Exp - HBC 291		
Exp - HBC 342		
Falconer's Flight®	10-12%	
Falconer's Flight® 7C's	8.5-10.5%	
First Gold (U.K.)	6.5-8.5%	U.K. Kent Golding, maybe Crystal
Fuggie (U.S.)	4-5.5%	U.K. Fuggie, Willamette, Styrian Golding, U.S. Tettnanger
Galaxy (Australia)	11-16%	
Galena (U.S.)	10-14%	Nugget, Cluster, Chinook, Eroica, Newport
Glacier (U.S.)	5-9%	Willamette, Fuggie, Tettnanger, Styrian Goldings
Golding (U.S.)	4-6%	U.K. Golding, U.K. Progress, Whitbread Golding Variety
Green Bullet (New Zealand)	11-14%	Crystal, Hallertauer Tradition, Liberty, Mt. Hood, Ultra
Hallertau Aroma (New Zealand)	6.5-8.5%	Perle
Hallertau Blanc (German)	9-12%	
Hallertau (German)	3.5-5.5%	Crystal, Liberty
Hallertau (U.S.)	3.5-5.5%	Hallertauer Tradition, Liberty, Ultra
Hallertauer Gold (German)	6-6.5%	Crystal, Mt. Hood
Hallertauer Mittelfrüh (German)	3-5.5%	Hallertau German, German Tradition, Liberty, Ultra
Helga (Australia)	4.9-7.3%	German Hallertau
Herald (U.K.)	11-13%	
Herkules (German)	12-17%	

Hersbrucker (German)	3-5.5%	French Strisslespalt, Mt. Hood
Horizon (U.S.)	11-14%	Magnum
Hull Melon (German)	7-8%	
Kent Golding (U.K.)	4-5.5%	Fuggie, Progress, First Gold
Kohatu (New Zealand)	0.03	
Legacy (U.S.)		
Liberty (U.S.)	3-6%	Hallertau, Tettnanger, Mt. Hood, Crystal, Ultra
Lublin (Poland)	3-4.5%	Czech Saaz, U.S. Saaz, U.S. Tettnanger, Sterling
Magnum (German)	12-16%	Northdown, Northern Brewer, Horizon
Magnum (U.S.)	10-14%	Northdown, Northern Brewer
Mandarina Bavaria (German)	7-10%	Cascade
Marynka (Poland)	9-12%	
Merkur (German)	12-15%	Magnum
Millenium (U.S.)	12-15%	Nugget, Columbus
Mosaic™ (HBC 369 cv.) (U.S.)	11.5-13.5%	Nugget, Simcoe
Motueka (New Zealand)	6.5-7.5%	Czech Saaz, U.S. Saaz
Mt. Hood (U.S.)	3-8%	Crystal, French Strisslespalt, Hersbrucker
Mt. Rainier (U.S.)	5-8.1%	Hallertauer
Nelson Sauvín (New Zealand)	12-14%	
Newport (U.S.)	13-17%	Galena, Nugget, Fuggie, Magnum
Northdown (U.K.)	7.5-9.5%	Admiral, Challenger
Northern Brewer (German)	7-10%	Chinook, U.S. Northern Brewer
Northern Brewer (U.S.)	6-10%	Chinook, Nugget
Northwest Golding	4-5%	
Nugget (U.S.)	11-14.5%	Cluster, Galena, Brewers Gold, Warrior, Eroica, Target, Millenium
Olympic (U.S.)	11-13%	Chinook
Opal (German)	5-8%	Styrian Golding
Orbit (New Zealand)		
Pacific Gem (New Zealand)	13-15%	Galena
Pacific Jade (New Zealand)	12-14%	
Pacifica (New Zealand)	5-6%	Hallertau family
Palisade® (Brand YCR 4 cv.) (U.S.)	5.5-9.5%	Perhaps Cascade
Perle (German)	6-8.5%	U.S. Perle, Northern Brewer
Perle (U.S.)	6-9.5%	Northern Brewer, Cluster, Galena, Chinook
Phoenix (U.K.)	8-13%	U.K. Challenger, U.K. Kent Golding, U.K. Northdown
Pilgrim (U.K.)	9-13%	U.K. Challenger, U.K. Target
Pioneer (U.K.)	8-10%	U.K. Kent Golding
Polaris (German)	18-24%	
Premiant (Czech)	8-12.5%	
Pride of Ringwood (Australia)	7-10%	Galena, Cluster
Progress (U.K.)	5-7.5%	Fuggie, U.K. Kent Golding
Rakau (New Zealand)	10-11%	Amarillo, Summit
Riwaka (New Zealand)	4.5-6.5%	Czech Saaz, possible American "C" hops
Saaz (Czech)	3-4.5%	U.S. Saaz, Polish Lublin
Saaz (U.S.)	3-5%	Czech Saaz, Polish Lublin
Santiam (U.S.)	5-7.9%	German Spalt, German Spalt Select, German Tettnanger
Saphir (German)	2.5-4.5%	Any noble hops
Satus	12.5-14%	Galena
Select (German)	4-6%	Czech Saaz, German Spalt, Tettnanger
Simcoe® (Brand YCR 14 cv.) (U.S.)	12-14%	Magnum, Summit
Sladek (Czech)	5-6%	Czech Saaz, Lublin, U.S. Saaz, U.S. Tettnanger
Smaragd (German)	4-6%	
Sorachi Ace (Japan)	13-16%	
Southern Cross (New Zealand)	11-14%	
Sovereign (U.K.)	5-6%	U.K. Fuggie

Spalt (German)	4-5.5%	Santiam, Liberty, Tettninger, Hallertau
Spalt Select (German)	4-6%	German Spalt, U.S. Saaz, U.S. Tettninger
Spalt Select (U.S.)	3-5%	Saaz, Tettninger
Sterling (U.S.)	6-9%	Saaz, Polish Lublin
Sticklebract (New Zealand)		
Strisslespalt (France)	3-5%	Crystal, Hersbrucker, Mt. Hood
Styrian Aurora (Slovenia)	7-9.5%	Northern Brewer, Styrian Golding, U.S. Styrian Bobek
Styrian Bobek (Slovenia)	3.5-7%	Styrian Golding, U.K. Fuggle, U.S. Fuggle, Willamette
Styrian Celeia (Slovenia)	3-6%	Styrian Golding, Saaz, Styrian Bobek
Styrian Golding (Slovenia)	4.5-6%	U.K. Fuggle, U.S. Fuggle, Willamette
Styrian Golding/Celeia (Slovenia)	3-6%	Styrian Golding, Czech Saaz, Styrian Bobek
Styrian Savinjski Golding (Slovenia)	2.8-5.5%	Styrian Bobek, Fuggle
Summer (Australia)	5.6-6.4%	
Summit (U.S.)	16-18%	Cascade, Simcoe, Amarillo
Sun	12-16%	Magnum
Super Alpha (New Zealand)	10-12%	Dr. Rudi NZ
Super Pride (Australia)	14%	Pride of Ringwood
Sussex (U.K.)	4.3-5.8%	
Sylva (Australia)	5.6-7.3%	
Tahoma (U.S.)		
Target (U.K.)	9.5-12.5%	Fuggle, Willamette
Taurus (German)	12-17%	Magnum
Tett nang (German)	3.5-5.5%	German Spalt, German Spalt Select, Saaz, U.S. Tettninger
Tett nang (U.S.)	3.4-5.2%	Czech Saaz, German Spalt, Santiam
Tomahawk	15-17%	Columbus
Topaz (Australia)	13.7-17.7%	
Tradition (German)	5-7%	Hallertau German, Hallertauer Mittelfrüh, Hersbrucker
Triple Pearl (U.S.)		
Triskel (French)		
Ultra (U.S.)	2-4.1%	Liberty, Saaz
Vangaurd (U.S.)	5-6%	Liberty, Hallertau
Vic Secret (Australia)	14-17%	
Wai-iti (New Zealand)	0.034	Saaz
Waimea (New Zealand)	16-19%	
Wakatu (New Zealand)	6.5-8.5%	
Warrior® (Brand YCR 5 cv.) (U.S.)	15-17%	Nugget, Columbus
WGV (Whitbread Golding Variety) (U.K.)	5-7%	Glacier, Styrian Golding, U.K. Kent Golding, U.K. Progress, U.K. Target
Willamette (U.S.)	3.5-6%	Styrian Golding, Target, Fuggle, Tettninger, Glacier
Yakima Cluster (U.S.)	6-8.5%	
Yakima Gold (U.S.)		
Zeus	13-17%	Columbus
Zythos	10-12.5%	