# BREWSHEET v3.4 (2014-12-14)

user input
calculated

| Brew | | | |
|---|---|---|---|
| Name: | Back in Black IPA | | |
| Brew Date: | 2020 April 20 | Collected (gal): | 10.50 |
| Rack Date: | | Racked (gal): | |
| Keg/Bottle Date: | 2020 May 24 | Kegged/Bottled (gal): | 10.00 |
| **Estimated** | | **Actual** | |
| ABV (%): | 7.1% | ABV (%): | 6.7% |
| OG (SG): | 1.067 | OG (SG): | 1.068 |
| FG (SG): | 1.013 | FG (SG): | 1.017 |
| IBU: | 75.8 | IBU: | 78.8 |
| SRM: | 41.9 | SRM: | 42.3 |
| IBU/Gravity Ratio: | 1.12 | IBU/Gravity Ratio: | 1.16 |

| Grain | Pounds | Potential | SG Share | Color | % Bill |
|---|---|---|---|---|---|
| Pale Malt (2-Row) US | 16.37 | 1.036 | 0.037 | 2.4 | 53.75% |
| British crystal 50-60L | 7.00 | 1.034 | 0.015 | 18.2 | 22.99% |
| Caramel/Crystal 150L | 0.69 | 1.033 | 0.001 | 150.0 | 2.27% |
| Caramel/Crystal 90L | 0.72 | 1.034 | 0.002 | 90.0 | 2.35% |
| Caramel/Crystal 80L | 0.75 | 1.034 | 0.002 | 80.0 | 2.46% |
| Chocolate Malt | 0.53 | 1.028 | 0.001 | 350.0 | 1.73% |
| Carafa I | 1.80 | 1.032 | 0.004 | 401.7 | 5.90% |
| Belgian Special "B" | 0.26 | 1.030 | 0.001 | 220.0 | 0.87% |
| Melanoidin | 0.75 | 1.037 | 0.002 | 20.0 | 2.46% |
| Flaked Oats | 1.59 | 1.033 | 0.003 | 2.2 | 5.22% |

| Hop | Type | Ounces | Boil Time | Alpha % | IBU | % Bill |
|---|---|---|---|---|---|---|
| Centennial | L | 2.00 | fwh | 10.8% | 27.8 | 8.42% |
| Cascade | P | 2.00 | 30 | 4.7% | 9.7 | 8.42% |
| Centennial | L | 1.75 | 30 | 10.8% | 17.0 | 7.37% |
| Centennial | P | **0.00** | 30 | 9.3% | 0.0 | 0.00% |
| Cascade | P | 4.00 | 10 | 4.7% | 9.2 | 16.84% |
| Columbus | P | 1.50 | 10 | 16.6% | 12.1 | 6.32% |
| Cascade | P | 2.00 | 0 | 4.7% | 0.0 | 8.42% |
| Columbus | P | 1.50 | 0 | 16.6% | 0.0 | 6.32% |
| Citra | L | **3.50** | 0 | 12.9% | 0.0 | 14.74% |
| Cascade | P | 4.00 | dry | 4.7% | 0.0 | 16.84% |
| Columbus | P | 0.00 | dry | 16.6% | 0.0 | 0.00% |
| Simcoe | P | **0.50** | dry | 13.3% | 0.0 | 2.11% |
| Amarillo | P | 1.00 | dry | | 0.0 | 4.21% |

**Design Notes**

Using RO water; so at dough-in, add:
10.0 ml lactic acid (88%)
9.65 g CaSO4 (calcium sulfate/gypsum)
4.85 g CaCl2 (calcium chloride)
8.0 g MgSO4 (magnesium sulfate/epsom salt)
4.5 g Ca(OH)2 (calcium hydroxide/slaked lime)
3.9 g NaHCO3 (baking soda)
At boil, add:
5.7 g CaSO4 (calcium sulfate/gypsum)
2.9 g CaCl2 (calcium chloride)
4.7 g MgSO4 (magnesium sulfate/epsom salt)
2.7 g Ca(OH)2 (calcium hydroxide/slaked lime)
2.3 g NaHCO3 (baking soda)
Target is 5.28 mash pH, 140 ppm calcium, 18 ppm magnesium, 25 ppm sodium, 55 ppm chloride, 200 ppm sulfate

| Batch Variables and Calculations | |
|---|---|
| Batch Size (gal): | 11.00 |
| Grain Temperature (F): | 68 |
| Total Grain Weight (lbs): | 30.45 |
| **Mash** | |
| Mash Time (min): | 60 |
| Desired Mash Temperature (F): | 155 |
| Strike Water (gal): | 11.07 |
| Strike Temperature (F): | 174 |
| Mash Ratio (qts/lb): | 1.45 |
| Grain Absorption (gal): | 3.81 |
| Mash Volume (gal): | 13.50 |
| Mash-out Temperature (F): | 168 |
| Estimated First Runnings (gal): | 7.12 |
| First Runnings (gal): | 7.25 |
| First Runnings Gravity (Brix): | 19.30 |
| First Runnings Gravity (SG): | 1.075 |
| **Sparge** | |
| Desired Sparge Temperature (F): | 168 |
| Sparge Water (gal): | 6.65 |
| Sparge Water Temperature (F): | 172 |
| Estimated Second Runnings (gal): | 7.12 |
| Second Runnings (gal): | 7.00 |
| Second Runnings Gravity (Brix): | 10.00 |
| Second Runnings Gravity (SG): | 1.039 |
| Estimated Preboil Volume (gal): | 14.24 |
| Estimated Preboil Gravity (Brix): | 14.73 |
| Preboil Volume (gal): | 14.25 |
| Preboil Gravity (Brix): | 14.60 |
| Preboil Gravity (SG): | 1.057 |
| Extraction Efficiency (%): | 76% |
| **Boil** | |
| Boil Time (min): | 60 |
| Estimated Evaporation Loss (gal): | 1.20 |
| Hop Absorption (gal): | 1.00 |
| Volume Left in Kettle (gal): | 0.00 |
| Actual Evaporation Rate (gal/hr): | 1.73 |
| Actual Evaporation Loss (gal): | 1.73 |
| Original Gravity (Brix): | 17.58 |
| Batch Size Efficiency (%): | 71% |
| Actual Efficiency (%): | 68% |
| **Fermentation** | |
| Primary Fermentation (days): | 14 |
| Primary Fermentation Temperature (F): | 62 |
| Gravity After Primary Fermentation (SG): | |
| Temperature of Reading (F): | |
| Corrected SG: | |
| Secondary Fermentation (days): | 4 |
| Secondary Fermentation Temperature (F): | 70 |
| Gravity After Secondary Fermentation (SG): | |
| Temperature of Reading (F): | |
| Corrected SG: | |
| Tertiary Fermentation (days): | 3 |
| Tertiary Fermentation Temperature (F): | 32 |
| Final Gravity (SG): | 1.017 |
| Temperature of Reading (F): | 41 |
| Corrected SG: | 1.017 |
| Target Fermentation for Diacetyl Rest (%): | |
| Target Gravity for Diacetyl Rest (SG): | |
| Calories per Pint: | 227 |
| 12 oz. Bottles Required: | 102 |
| **Carbonation** | |
| Bottling Temperature (F): | |
| Volumes of CO2: | 1.90 |
| Priming Sugar (oz): | |
| DME (oz): | |
| Forced Carbonation (lbs): | |

| System Variables | |
|---|---|
| Brewhouse Efficiency (%): | 70% |
| Volume in Hoses (gal): | 0.22 |
| Volume in Wort Chiller (gal): | 0.19 |
| Volume in HERMS Coil (gal): | 0.25 |
| Mash/Lauter Tun Deadspace (gal): | 0.14 |
| Strike to Sparge Volume Ratio (%): | 50% |
| Trub Loss (gal): | 0.16 |
| FWH IBU Factor (%): | 10% |
| Strike Temperature Factor (F): | 7 |
| Sparge Temperature Factor (F): | 4 |
| Estimated Evaporation Rate (gal/hr): | 1.20 |
| Leaf Hop Absorption Ratio (qts/oz): | 0.40 |
| Pellet Hop Absorption Ratio (qts/ oz): | 0.10 |
| Cooling Losses (%): | 4% |
| Hydrometer Correction (SG): | 0.001 |

| BJCP Style Guidelines | | |
|---|---|---|
| Style: | Cascadian Dark Ale | |
| Code: | | 0 |
| OG: | 1.060-1.075 | |
| FG: | 1.008-1.016 | |
| IBU: | 60.0-90.0 | |
| SRM: | 30.0-40.0 | |
| ABV: | | 0 |
| CO2: | 1.5-2.3 | |

| Yeast Strain | |
|---|---|
| Yeast Strain: | Danstar Nottingham (Dry Ale) |
| Type: | Dry Ale |
| Attenuation (%): | 75-85% |
| Actual Attenuation (%): | 75% |
| Fermentation Temp (F): | 57-70F |
| Flocculation: | high |
| **Required Amounts** | |
| Cell Count (billions): | 511 |
| Vials (White Labs/Wyeast): | |
| Dry Yeast (g): | 25.6 |
| **Yeast Starter/Slurry** | |
| Vials (White Labs/Wyeast): | |
| Date Yeast Produced: | |
| Yeast Viability (%): | |
| Yeast Growth Rate: | |
| Yeast Innoculation Rate (million/ml): | |
| Starter Volume Required (ml); | |
| DME Required (oz): | |
| Yeast slurry concentration (billion/ml): | 2.5 |
| Non-yeast Percentage (%): | 20% |
| Yeast Slurry Required (ml): | |

| User Variables | |
|---|---|
| | |

| Batch Scaling | | | |
|---|---|---|---|
| Desired OG: | 1.068 | Total Weight (lbs): | 30.41 |
| Batch Size (gal): | 11.00 | Total Bill: | 100.00% |
| Brewhouse Efficiency (%): | 70% | | |
| **Grain** | **Pounds** | **Potential** | **Color** | **% Bill** |
| Pale Malt (2-Row) US | 22.96 | 1.036 | 2.0 | 75.50% |
| Caramel/Crystal 20L | 1.98 | 1.035 | 20.0 | 6.50% |
| Caramel/Crystal 150L | 1.98 | 1.033 | 150.0 | 6.50% |
| Chocolate Malt | 0.99 | 1.028 | 350.0 | 3.25% |
| German carafa | 0.99 | 1.030 | 400.0 | 3.25% |
| Flaked oats | 1.52 | 1.033 | 2.2 | 5.00% |

| Poundage | | |
|---|---|---|
| Goal (lbs): | | |
| Amount (lbs \| oz.f_oz): | | |
| Amount (lbs \| oz.f_oz): | | |
| Amount (lbs \| oz.f_oz): | | |
| Amount (lbs \| oz.f_oz): | | |
| Amount (lbs \| oz.f_oz): | | |
| Amount (lbs \| oz.f_oz): | | |
| Amount (lbs \| oz.f_oz): | | |
| Amount (lbs \| oz.f_oz): | | |
| Amount (lbs \| oz.f_oz): | | |
| Amount (lbs \| oz.f_oz): | | |
| Amount (lbs \| oz.f_oz): | | |
| Amount (lbs \| oz.f_oz): | | |
| Needed (lbs \| oz.f_oz): | | |

| Hydrometer Correction | |
|---|---|
| SG: | 1.067 |
| Temperature (F): | 65 |
| Corrected SG: | 1.068 |

| Gravity Calculator | | |
|---|---|---|
| Brix: | 17.15 | 17.58 |
| Specific Gravity: | 1.067 | 1.068 |
| Degrees Plato: | 16.16 | 16.53 |

| Brix Ethanol Correction | |
|---|---|
| Original Brix: | |
| Current Brix: | |
| SG: | |

**Brewing Notes**

4/20: mash-in at 157F; reduced to 155F in ~15min.
5/7: dry hopped.
5/18: crashed.