



## 2018-2020 Chart Book: Nutrition at a Glance

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## NUTRITION 2018 AT A GLANCE

Prepared by Carolyn J. DeMoranville and Katherine M. Ghantous as an addendum to the 2018-2020 Chart Book

**UMass Cranberry Station** <http://ag.umass.edu/cranberry> 508-295-2212 x 20

### REFER TO 2018-2020 CRANBERRY CHART BOOK FOR ADDITIONAL INFORMATION

The Commonwealth of Massachusetts regulation 330 CMR 31.00 requires growers to follow UMass Extension nutrient management recommendations (the Chart Book) and keep records of fertilizer applications and soil and tissue test results. Having a copy of the Chart Book and the required records satisfies the regulatory requirements - you are not required to have a separate written plan. The Cranberry Station website 'Nutrient Management for Cranberries' Quick Link (<http://ag.umass.edu/cranberry>) includes a plan template and Excel files with sample record keeping formats and nutrient calculators (determine fertilizer rates based on how much nutrient you want to apply). The BOGS system, available from the Cape Cod Cranberry Growers Association, is an online tool designed to plan and keep records that meet regulatory requirements for pesticide and nutrient applications.

**Recommended nitrogen base rate range** reflects varying crop loads: up to 600 bbl/A for the newest hybrids and up to 300 bbl/A for the others. This does not mean that higher yields necessarily would require more N. In fact, for all but the newest cultivars, adding more N than required can result in yield *decline*.

| Cultivar group   | Base N rate lb/A | Other considerations                          |
|--|------------------|---|
| Natives:<br>Early Black and Howes  | 25-40            | Reduce to 25-30 for crops less than 200 bbl/A |
| Older hybrids and large fruit:<br>Ben Lear, Stevens, Grygleski, Pilgrim                          | 35-50            | Reduce to 35-40 for crops less than 200 bbl/A |
| Rutgers and University of Wisconsin cultivars: Crimson Queen, Demoranville, Mullica Queen, HyRed | 50-80            | Reduce to 50-60 for crops less than 300 bbl/A |

| Stage/formulation  | % of total N for the season |
|--|-----------------------------|
| <b>Slow or controlled release</b>                                  |                             |
| Pre-roughneck (mid-May)  | 50-100%*                    |
| *if less than 100%, apply remainder at set using fast-acting       |                             |
| <b>Fast-acting, soluble sources including soil-applied liquids</b> |                             |
| <b>All but the newest cultivars</b>                                |                             |
| Roughneck to hook  | up to 20%                   |
| 75% in bloom (early set)   | 50-60%                      |
| 75% out of bloom (late set)  | 30-40%                      |
| <b>Rutgers and U-WI cultivars</b>                                  |                             |
| Roughneck to hook  | up to 20%                   |
| First fruit set  | 30-35%                      |
| 7 days later   | 30-35%                      |
| 7 days later   | 20-30%                      |

**Recommended phosphorus rates.** Very little P is removed from the bog in the harvested crop! There is *no evidence* that more than 20 lb/A actual P is required for productive cranberries. P can be an environmental pollutant. Adverse environmental impacts are reduced by using moderate P rates (no more than 20 lb/A per season) and by careful attention to harvest flood management.

| Production system                                      | Recommended P rate lb/A | as P <sub>2</sub> O <sub>5</sub> lb/A | Notes  |
|--|-------------------------|---------------------------------------|--|
| New plantings  | up to 30                | up to 68                              | Initial year only                                |
| Established beds, tissue test >0.16%                   | no more than 10         | no more than 23                       |  |
| Established beds, tissue test 0.11-0.15% and stable    | no more than 15         | no more than 34                       | Trying a lower rate (e.g. 10 lb/A) is encouraged |
| Established beds, tissue test <0.12% and trending down | up to 20                | up to 45                              | 15 lb/A P with testing should suffice            |
| Established beds, tissue test <0.10%                   | 20                      | 45                                    |  |

**Recommended potassium rates.** Cranberry sand soils are naturally low in K, leading an annual requirement for K additions. Supplemental K may be applied as soon as the soil warms in the spring, generally in early May. Otherwise, K is generally added with nitrogen and phosphorus (NPK).

|                              | Recommended K rate lb/A | Other considerations  |
|------------------------------|-------------------------|---|
| Soil and tissue tests normal | up to 100               | Look for NPK with similar first and third numbers   |
| Soil and tissue tests low    | 60-100                  | Consider a supplement like SulPoMag or KMag at 100-150 lb/A or a soil-applied liquid K supplement |
| Tissue test high             | 0-60                    | Use no supplements  |

## Calculating Fertilizer N and P Rates -- important for planning

Fertilizer labels have three numbers that are N-P-K. These numbers are percent by weight, and also the amount per 100 lbs of fertilizer.

**Nitrogen (N)** - First number on the bag is percent N

*N example:* You have a 50 pound bag of **18** – 8 – 18

To figure out how much N is in the bag of fertilizer:

1. Multiply the first number by weight of the bag
  - $18 \times 50 = 900$
2. Because the number on the bag is a percentage, you then divide by 100 to calculate how much nitrogen you are applying
  - $900/100 = 9$

For every 50 lbs of this fertilizer, you are adding 9 lbs of N.

\*\*shortcut - for a 100 pound application - the first number is pounds applied on the bog

**Phosphorus (P)** - Middle number on the bag is percent phosphorus as *phosphate* -  $P_2O_5$

*P example:* You have a 50 pound bag of 12 – **24** – 12

To figure out how much actual P is in the bag of fertilizer:

1. Multiply the second number on the bag by 0.44 (conversion factor)
  - $24 \times 0.44$  (conversion factor) = 10.56
2. Multiply this number by weight of the bag
  - $10.56 \times 50$  (weight of the bag) = 528
3. Because the number on the bag is a percentage, you then divide by 100 to calculate how much P you are applying
  - $528/100 = 5.28$

For every 50 lbs of this fertilizer, you are adding 5.28 lbs of P.

NOTE: if you want less than 20 pounds actual P on the bog, limit to no more than 45 pounds of *phosphate*

**Potassium (K)** - Last number on the bag is percent potassium as *potassium oxide* -  $K_2O$

*K example:* You have a 50 pound bag of 0 – 0 – **22**

To figure out how much actual K is in the bag of fertilizer:

1. Multiply the third number on the bag by 0.83 (conversion factor)
  - $22 \times 0.83$  (conversion factor) = 18.26
2. Multiply this number by weight of the bag
  - $18.26 \times 50$  (weight of the bag) = 913
3. Because the number on the bag is a percentage, you then divide by 100 to calculate how much K you are applying
  - $913/100 = 9.13$

For every 50 lbs of this fertilizer, you are adding 9.13 lbs of K.