2017

Observations of recently released cultivars in commercial beds: yield potential and fruit quality issues

Nicholi Vorsa

Observations of recently released cultivars in commercial beds: yield potential and fruit quality issues

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Rutgers Univ.
Marucci Center
Chatsworth, NJ

RUTGERS
New Jersey Agricultural Experiment Station

Rutgers varieties

2007 Crimson Queen® variety

Selected for yield, early season, high Tacy

2008 Demoranville® variety

Selected for yield, early season, high Tacy

2008 Mullica Queen® variety

Selected for yield, Tacy slightly higher than Stevens

Crimson Queen® variety
NJS98-23

McFarlin x Potters

MA WI

1988 Stevens x Ben Lear

NJ WI

2007 Crimson Queen

US Plant Patent PP18,252

Canadian Breeders Rights Cert. # 3742

Demoranville® variety NJS98-35

THE STATE UNIVERSITY OF NEW JERSEY
RUTGERS
COOK COLLEGE

Early Black x Howes

MA MA

1988 Franklin x Ben Lear

NJ WI

2008 Demoranville

US Plant Patent PP18,911

Canadian Plant Breeder's Rights applied for

Mullica Queen® variety

CNJ97-105-4

THE STATE UNIVERSITY OF NEW JERSEY
RUTGERS
COOK COLLEGE

Howes x Searles
MA WI

1997 No. 35 x Lemunyon
NJ NJ

2008 Mullica Queen

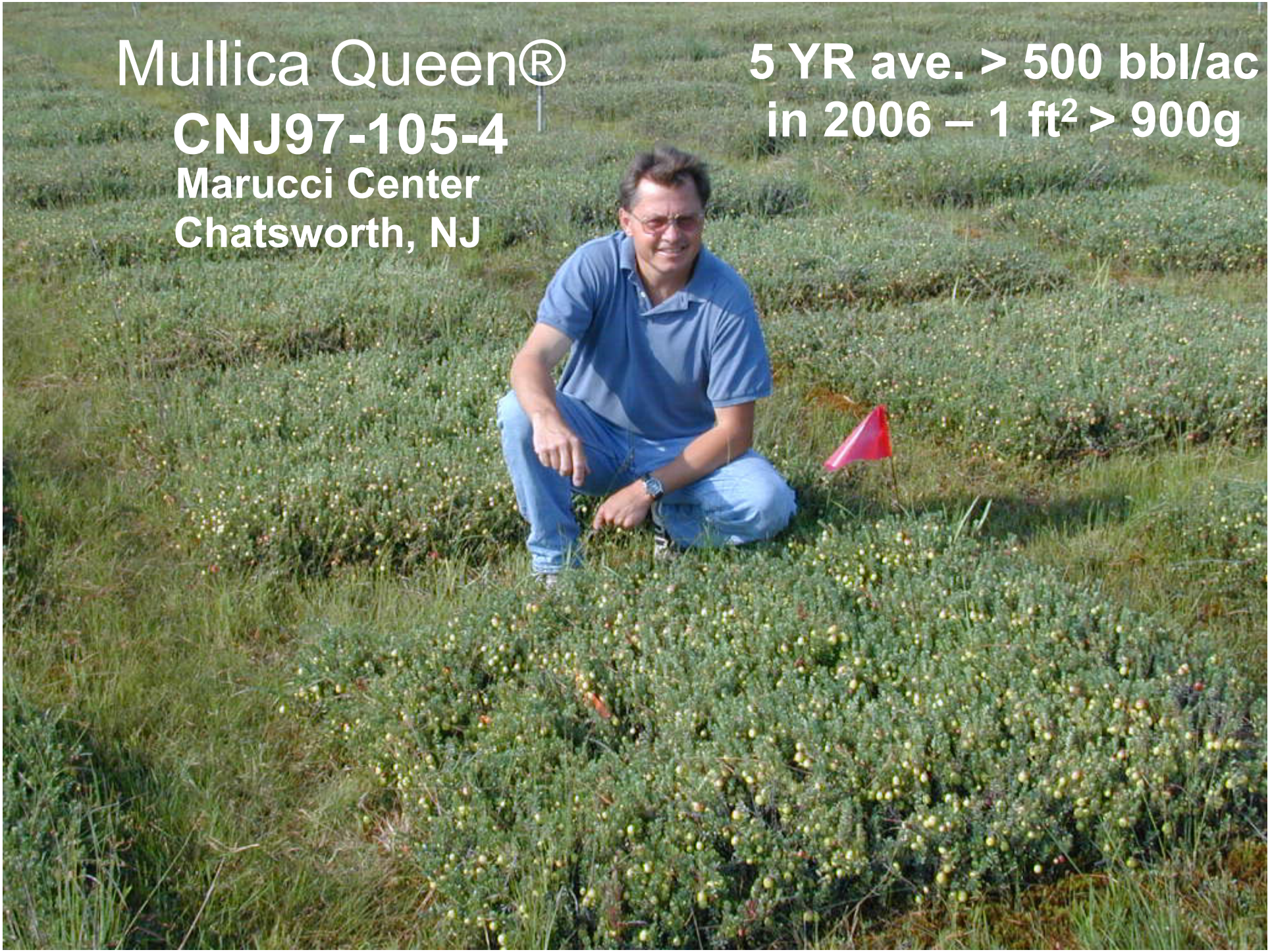
US Plant Patent PP19,434

Canadian Breeders Rights
Application Cert. # 3742

Chatsworth, NJ
1993

Crimson Queen and Demoranville varieties selected from over 1,400 progeny from 20 crosses
Made in 1988

Dubay's WI
1992

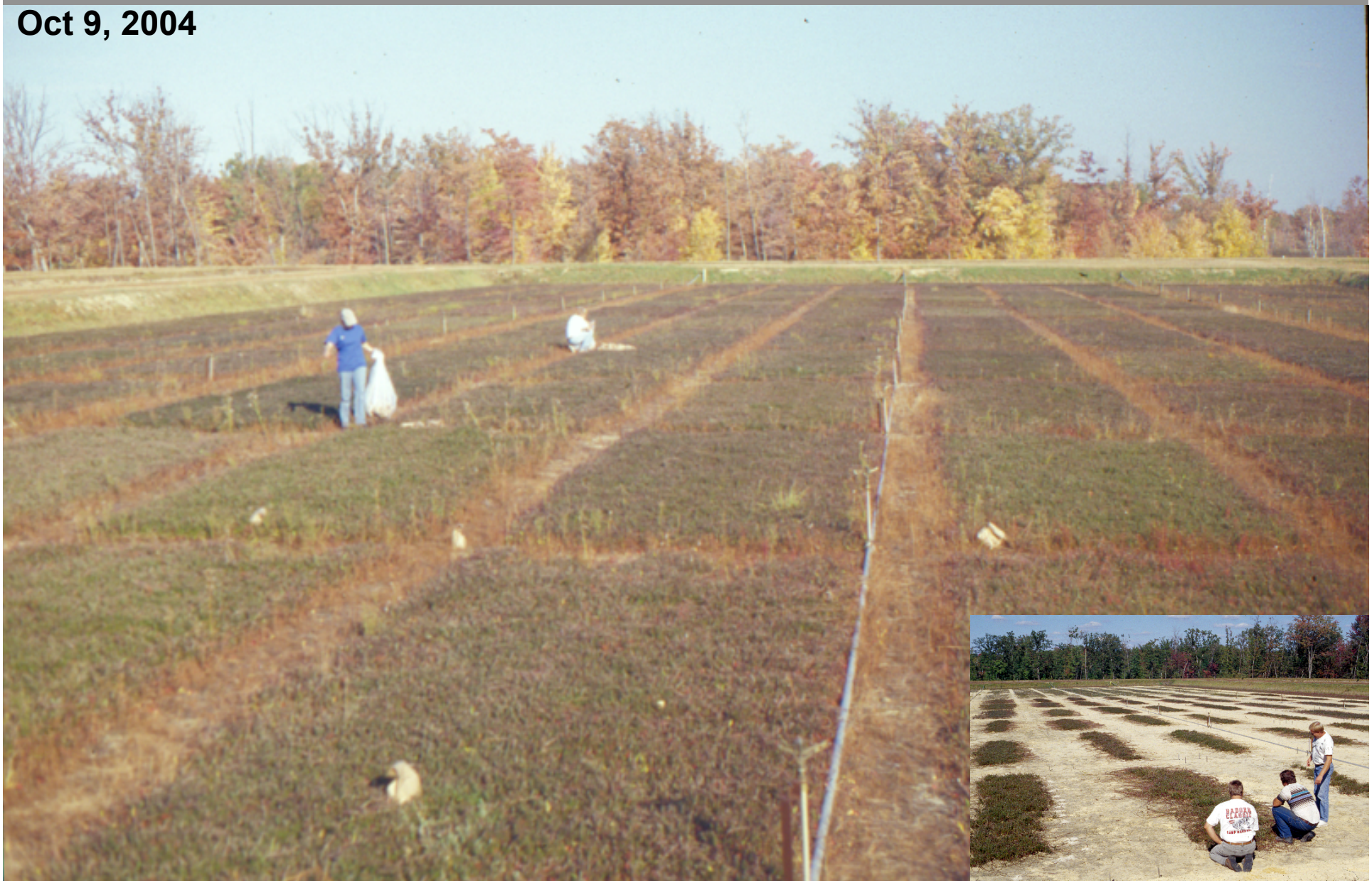

Mullica Queen®
CNJ97-105-4
Marucci Center
Chatsworth, NJ
5 YR ave. > 500 bbl/ac
in 2006 – 1 ft² > 900g

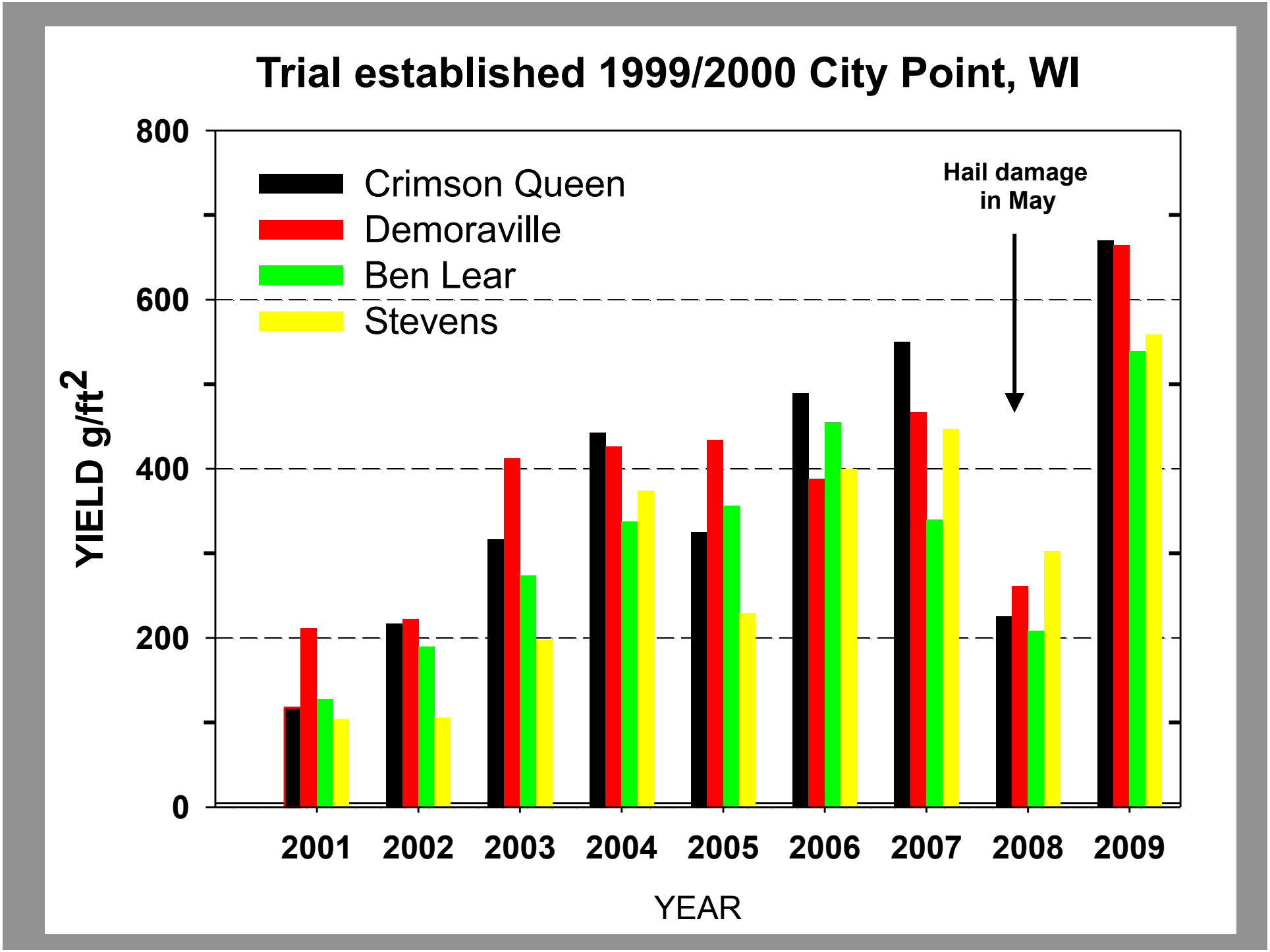
Jackson Co., WI

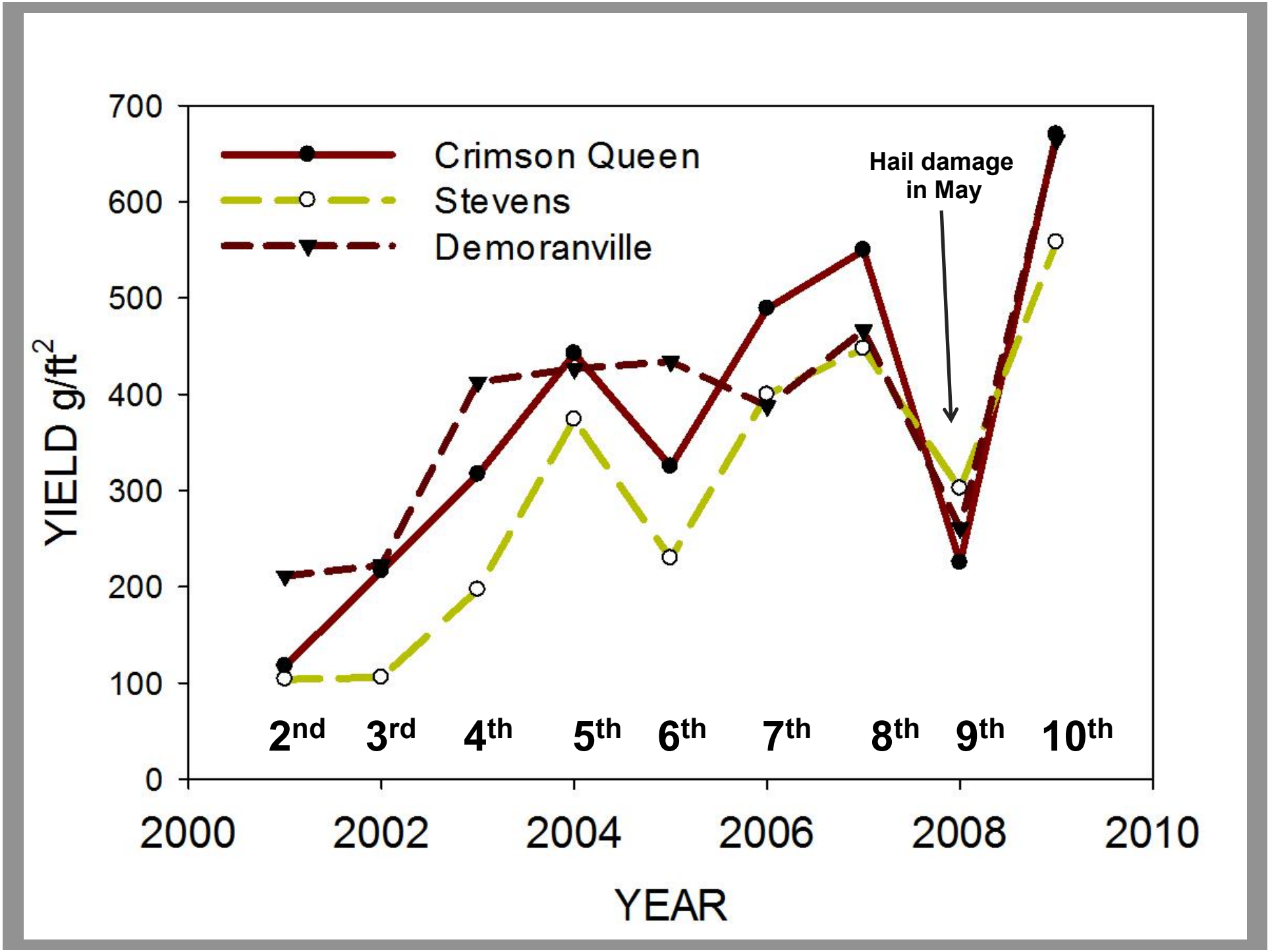
Planted

1st rep – 1999
2nd rep – 2000

Oct 9, 2004




Trial established 1999/2000 City Point, WI
800
600
400
200
0
YIELD g/ft2
Crimson Queen
Demoraville
Ben Lear
Stevens
Hail damage
in May
2001
2002
2003
2004
2005
2006
2007
2008
2009
YEAR


700
600
500
400
300
200
100
0
YIELD g/ft2
Crimson Queen
Stevens
Demoranville
Hail damage
in May
2nd
3rd
4th
5th
6th
7th
8th
9th
10th
2000
2002
2004
2006
2008
2010
YEAR

First commercial full bed plantings

- Jackson Co., WI 2006
  - Crimson Queen, Demoranville
- Monroe Co., WI 2006, 2007
  - Crimson Queen, Demoranville, Mullica Queen
- Burlington Co., NJ 2006, 2007
  - Crimson Queen, Demoranville, Mullica Queen
- Plymouth Co., MA 2006, 2007
  - Crimson Queen, Mullica Queen

Wisconsin, Jackson Co.,

Planted June 2006

		2009 harvest			2010 harvest		
Variety	**Date planted**	**Yield** bbl/ac	**tacy** mg/100g	**brix** % ss	**Yield** bbl/ac	**tacy** mg/100g	**brix** % ss
Crimson Q E7	**June 06**	**420**	--------	------	**592**	**55**	**7.8**
Demoranville E6	**June 06**	**474**	--------	------	**440**	**57**	**8.4**
Stevens E5	**June 07**	**310**	———	——	**320**	**35**	**7.7**

Warrens, WI 2006 planting in sand

Crimson Queen®

Mullica Queen®

Variety	Date Planted	2009 harvest Yield bbl/ac	2009 harvest tacy mg/100g	2009 harvest brix % ss	2010 harvest Yield bbl/ac	2010 harvest tacy mg/100g	2010 harvest brix % ss
Crimson Q	June 06	628 Sept 29	43	7.7	170 Sept 29	43	8.2
Mullica Q	June 06	637 Oct 1	42	8.3	434 Sept 29	28	8.2
Stevens	June 07	395 Oct 8	33	8.7	178 O c t 19	35	8.5

Variety	Date Planted	2009 harvest Yield bbl/ac	2009 harvest tacy mg/100g	2009 harvest brix % ss	2010 harvest Yield bbl/ac	2010 harvest tacy mg/100g	2010 harvest brix % ss
Demoranville	June 07	380 Oct 1	38	8.1	559 Sept 22	53	7.7
Stevens	Estab.	350	—	——	350	——	——

Mullica Queen

				bbls./acre			
Bed	Acres	Planted	Age	2016	5yr/av	Type	planting density/acre
MQ5	2.2	2007	10	673	621	RC	50,000+
MQ1	2.6	2010	7	492	311	M	1-1/2 ton
MQ4	2.2	2010	7	573	455	M	1-1/2 ton
MQ3	3.1	2010	7	688	498	RC	50,000+
MQ2b	3.2	2011	6	494	419	M	3 ton
MQ2	3.3	2012	5	579	401	RC	50,000+

RC – rooted cuttings
M- mowings

Wisconsin

Demoranville

				bbls./acre			
Bed	Acres	Planted	Age	2016	5yr/av	Type	planting density/acre
D6	1.6	2007	10	604	517	RC	50,000+
D13	0.6	2008	9	475	430	RC	50,000+
D2	1.0	2008	9	480	504	RC	50,000+

RC – rooted cuttings
M- mowings

Wisconsin

Crimson Queen

				bbls./acre			
Bed	Acres	Planted	Age	2016	5yr/av	Type	planting density/acre
CQ8	1.6	2006	11	547	466	RC	50,000+
CQ7	1.5	2008	9	558	537	RC	50,000+
CQ1	2.6	2010	7	355	343	M	1-1/2 ton
CQ2	2.7	2010	7	415	370	M	1-12 ton
					4yr/av		
CQ5	1.4	2013	4	264	316	M	2-1/2 ton
CQ6	2	2013	4	305	322	M	2-1/2 ton

RC – rooted cuttings, M- mowings

Wisconsin


Plymouth Co., MA – 2006 planting,
2009 - 277 bbl/ac

Plymouth Co., MA

Variety	Date planted	2009 harvest			2010 harvest		
		Yield bbl/ac	tacy mg/100g	brix % ss	Yield bbl/ac	tacy mg/100g	brix % ss
Crimson Q EH	**June 06**	**277** Sept 14	**19**	**7.7**	**163**[1] Sept 11	**17**	**8.1**
Crimson Q SC	**June 07**	---------	------	----	**226** Sept 11	**21**	**7.7**
Crimson Q TB	**June 07**	---------	------	----	**132** Sept 11	**21**	**8.2**
Mullica Q TR	**June 07**	**116** Sept 24	**22**	**7.9**	**322** Sept 24	**28**	**8.1**

[1] **heavily pruned and frost damage**

Demoranville Yields reported bbl/ac

Wisconsin	YEAR	• **Massachusetts**	**Year**
700+	2015	• **600+**	**2015**
800+ bb/ac	2016	**500+**	**2016**
600+ bb/ac	2016		

Crimson Queen Yields reported bbl/ac

Wisconsin	YEAR	• **Massachusetts**	**Year**
600+	2015	• **420**	**2015**
600+	2016	**400**	**2016**

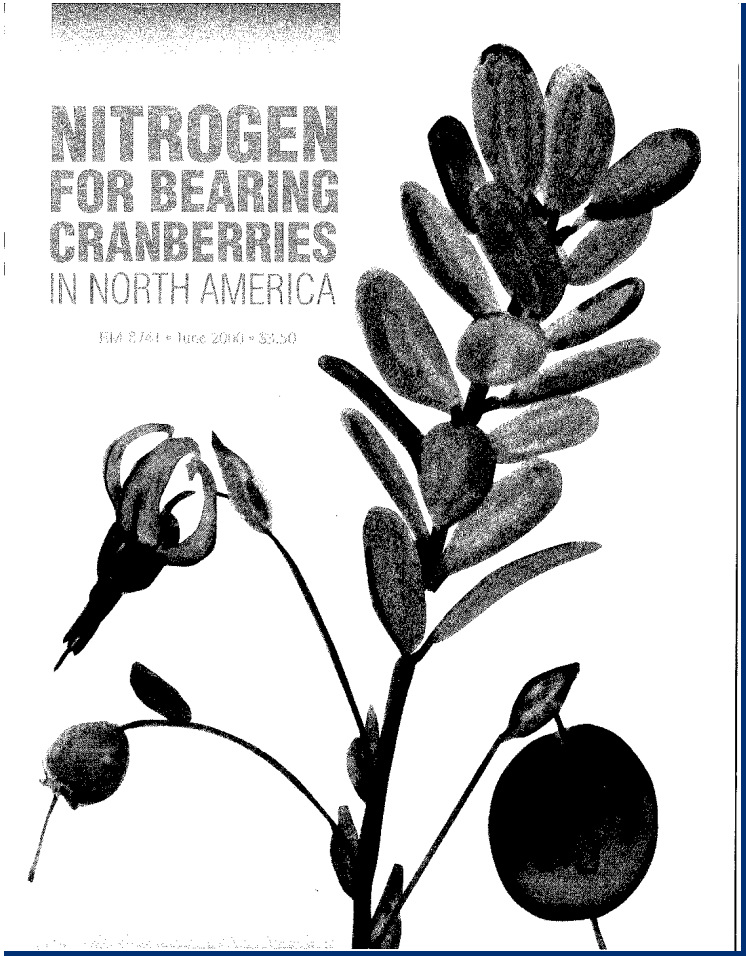
Mullica Queen Yields reported bb/ac

Wisconsin	YEAR	• **Massachusetts**	**Year**
850	2015	• **550+**	**2015**
773	2015	**470**	**3yr old**
733	2016		

Maintaining high yields in Massachusetts

		bbl/ac	
		2015	2016
Crimson Queen	6.7ac	451	272
Mullica Queen	1.8ac	550	340

Drought ?



Factors in achieving higher yield

Biomass – upright density

Bud set

Nutrition

Nitrogen ?

Phosphorus?

Pollination

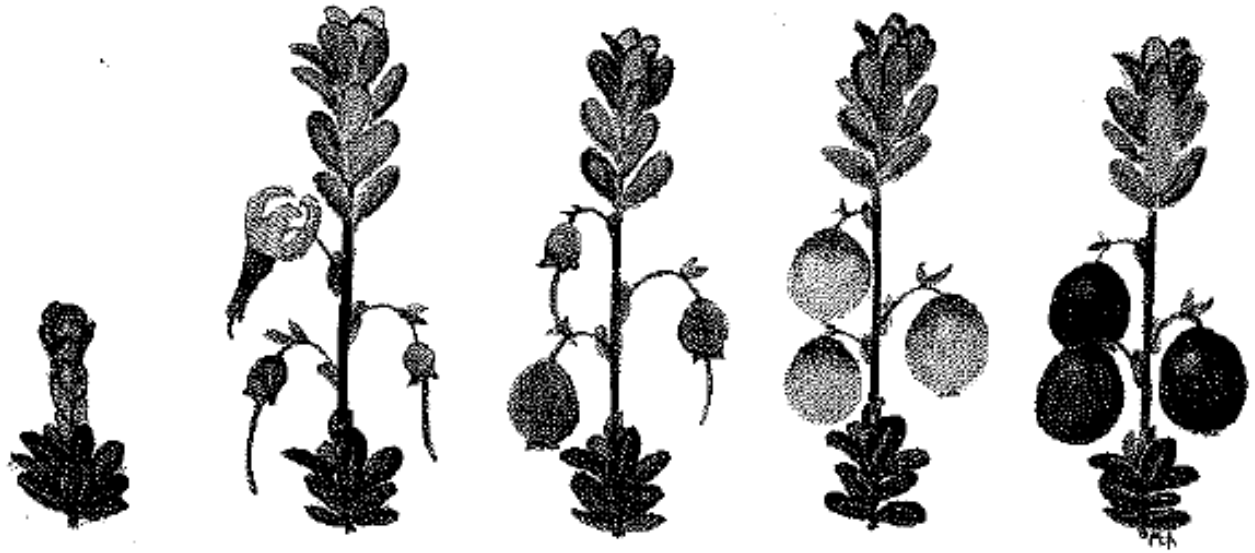
Water relations

Temp. stress

Soil type

- **Sand – low N environment**
- **Sand w/ organic matter – mod. N env.**
- Peat – mod-high N env.
- Muck – high N env.

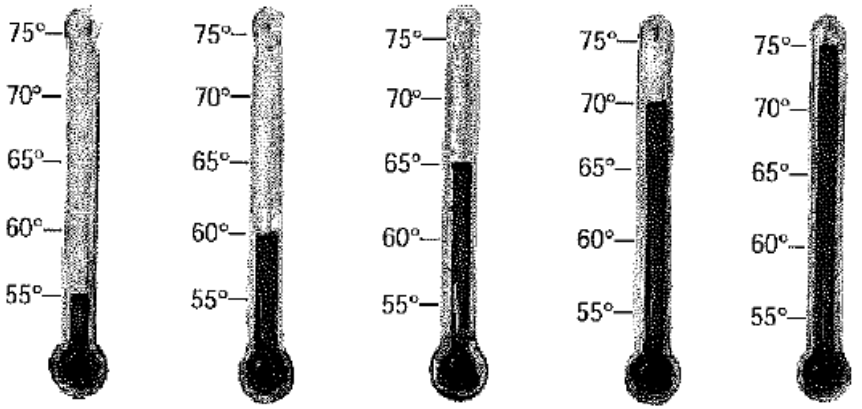
Figure 7.—Optimal nitrogen fertilizer application timing for cranberry production.



Area	Variety	Early growth	Early fruit set	Late fruit set	Bud set	Preharvest
BC	'Stevens'	✓	✓	✓	✓	
MA	'Early Black'	✓	✓	✓	✓	
NJ	'Early Black'		✓	✓	✓	
OR	'Stevens'		✓	✓	✓	
WA	'McFarlin'	✓	✓	✓	✓	
WI	'Stevens'	✓	✓	✓	✓	✓

Soil O.M. and temperature play a role in N release

Figure 9.—The influence of soil organic matter content and temperature on production of available N in cranberry beds.



Soil temperature 55°F 60°F 65°F 70°F 75°F

Soil type	% organic matter	N lb/a/day	N lb/a/day	N lb/a/day	N lb/a/day	N lb/a/day
Sand	0.5	0.2	0.2	0.2	0.2	0.3
Sanded peat	5.0	3.0	3.0	3.0	4.0	5.0
Peat	25.0	2.0	2.0	4.0	20.0	50.0
Muck	35.0	10.0	12.0	12.0	14.0	20.0

7.5 to 10 lbs N removed for every 100 bb/ac crop

Cranberry Nitrogen Balance Sheet

Item	Credit	Debit	Balance
1. Beginning balance			185
2. Removal of fruit / leaves		25-30	155
3. New root growth		50	105
4. N from soil for root growth	45		150
5. New shoot growth		50	100
6. N moving from old growth	45		145
7. Ending balance			145
8. Fertilizer N need			-40

Crop bbl/ac	lbs N removed
200	15 – 20
400	30 – 40
600	46 - 60

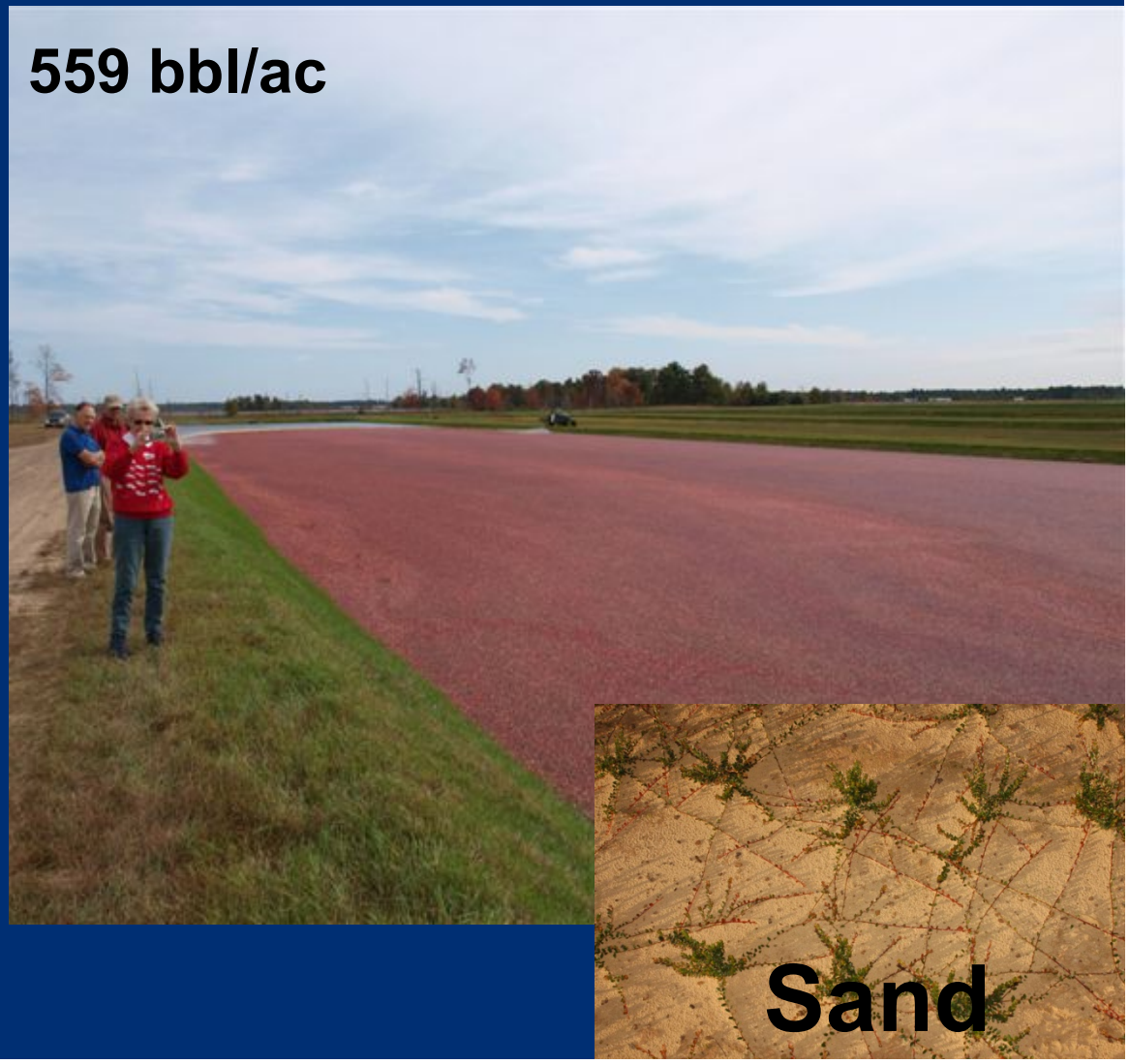
N Inputs

Demoranville

N Fert. in 2010

Date	N lb
• 5/26	10
• 6/3	15
• 6/17	14
• 6/22	13
• 6/30	10
• 8/20	2

64 total N



Anticipated N for heavy fruit crop

Crimson Queen
Demoranville
Mullica Queen

- **6/10** **10** - 5% open blossoms
- **6/17** **18** - mid-bloom
- **6/24** **14** - full-bloom
- **7/1** **10**
- **7/8** **8**
- **7/15** **8**

Rate adjusted to maintain a healthy leaf color until bud set

68 lbs total N

Sand 0% O.M.

Potential Risks of Higher Nitrogen Inputs

Fruit quality

Fruit rot

Sun scald

Excessive runnering

Acknowledgements

- J. Johnson-Cicalese

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- Haines & Haines
- Rezin & Son
- Integrity Propagation

RUTGERS
New Jersey Agricultural Experiment Station

- Ocean Spray Cranberries, Inc.
- NJAES
- USDA-CSREES