

Basic Pumpkin Production

Southwest Vegetable Conference 2017



JIM JASINSKI

OSU EXTENSION, ASSOCIATE PROFESSOR, IPM PROGRAM

DOUG DOOHAN & BOB PRECHEUR (HORT & CROP SCIENCE)
SALLY MILLER, MAC RIEDEL, LANNY RHODES (PLANT PATH)
CELESTE WELTY (ENTOMOLOGY)
BRAD BERGEFURD (EXTENSION)



THE OHIO STATE UNIVERSITY

Presentation Objectives



- Crop Statistics
- Basics of the Pumpkin Biz - Overview
 - Size, Equipment, Fertility, Varieties, Retail v. Whole, Pest Management, etc.
- Highlight Key Management of Pests
- Current Information / Field Days



OH NASS for Pumpkin



Year	Harvested A	\$ Millions
2009	7,500	22.5
2010	7300	16.7
2011	7100	16.6
2012	6400	19.3
2013	6800	15.4
2014	6700	18.7
2015	6400	14.4



Farm Size / Field Size / Experience



- Grown pumpkins before?
- Scale: hand labor vs. mechanization
- <2 acres, can probably manage w/ hand labor
 - Hoes, hand planting, back pack sprayers, irrigate?
- >2 acres, will probably need some level of mechanical advantage (equipment)
 - Tractors, tillage, cultivator, planter, transplanter, sprayer, transport, irrigation, harvest labor, etc.
- Planting window – end of May to 3rd wk June for Labor day delivery (early Sept.)



Equipment



Gempler's ATV sprayer



Back pack sprayer

Gemplers.com



3 point hitch sprayer



Equipment



Hand planter



Direct Seeder – Vacuum Planter



Equipment



Mechanical Transplanter



Equipment



Fertilizer Spreader



Fertility



- **Recommended rate**
 - 100 lb N-P-K per acre, incorporate if possible
 - Too much N promotes vegetative growth, no or few fruit produced
- **Conventional till - Split apply N**
 - 100% DAP (18-46-0) or MAP (11-52-0), Potash (0-0-Kx) PPI
 - 60% N pre plant incorporate with light tillage
 - Seed/Transplant
 - 40% N at vine tip (28-0-0)
- **No till - Split apply N**
 - 100% DAP (18-46-0) or MAP (11-52-0), Potash (0-0-Kx), broadcast
 - Seed/Transplant
 - Remaining N at vine tip (28-0-0)



Key Pumpkin Developmental Stages



- Cotyledon
- 1st, 2nd, 3rd, 4th leaf stage
- Small plants, bigger plants
- Vining
- Flowering (male & female 10:1)
- Fruit set/fruit development/fruit sizing (flowers <)
 - Pollination – do you need bees for pollination?
 - Contact bee keepers now, prices / availability
- Fruit maturation (flowers <)
- Fruit harvest



Key Pumpkin Developmental Stages



Cotyledon



1st True leaf



Key Pumpkin Developmental Stages

4+ Leaf Stage



Vining



Pumpkin Flowers



- Flowers male (?) & female (?)



Basic Horticulture



- Growth habit of plant
 - bush vs. small vine vs. large vine
 - row spacing 5-12', seed spacing 2-6'
- Fruit size – small, medium, large, giant
- Different fruit shape and color – final market expectation
 - traditional jack-o-lantern, ribbed, smooth, color, bumpy, heirloom, processing/pie, etc.
- Powdery mildew tolerant or resistant
- Fruit yield – tons / acre



Pumpkin Size & Yields



- Small fruited 5 to 7 ton/acre
 - 2 to 4,000 fruit/acre
- Large fruited 10 to 30 tons/acre
 - 1 to 2,000 fruit/acre
- Cut handles from vine, don't pull, leave long handle
- Windrow to cure a few days
- New Hybrids – grow on small scale first



Food for Thought

- **Marketing before Production**
- **Know your market before you plant**







Gladiator



THE OHIO STATE UNIVERSITY

A photograph of several pumpkins in a field. In the foreground, two large, bright orange pumpkins are prominent. Behind them, a pumpkin with a green and orange mottled pattern is visible. The pumpkins are surrounded by green foliage and vines. A white label with black text is placed in front of the pumpkins.

13. Cronus



THE OHIO STATE UNIVERSITY



6. Bellatrix





Warty
Goblin



THE OHIO STATE UNIVERSITY

A photograph of four orange pumpkins with a bumpy, warty texture. Three are sitting on a green plastic crate, and one is on the ground in front of it. A brown Spalding basketball is also on the ground next to the pumpkins. The background is a field of dry straw and green leaves.

SUPERFREAKS



THE OHIO STATE UNIVERSITY



Jill Be
Little

Jack
Be
Little

Half
Pint

Little
Giant

Mischief





Little
Giant



THE OHIO STATE UNIVERSITY

A photograph of a basketball and several pumpkins on a green wooden crate. The basketball is orange with black lines and the word "SPALDING" is visible. It is positioned in the center background. In front of it, on the green crate, are several small orange pumpkins. The pumpkins are arranged in three groups: a cluster on the left, a cluster in the center, and a cluster on the right. The background is green grass.

Munchkin

**Gold
Dust**

Gold Speck



A photograph of several orange pumpkins arranged on a green plastic crate in a field. A red Spalding basketball is placed among the pumpkins on the crate. The pumpkins are of various sizes and are surrounded by green foliage and dry grass. The text 'Gargoyle' is overlaid in yellow on the left side of the image.

Gargoyle

HMX8696

**Canon
Ball**

Field Trip





35. Snowball



THE OHIO STATE UNIVERSITY



Polar Bear



THE OHIO STATE UNIVERSITY



56. New Moon



THE OHIO STATE UNIVERSITY



Moonshine

Flat White Boar Ford





68. Grey Ghost





59. Fairytale





71. Jewel Box




THE OHIO STATE UNIVERSITY



72. Peanut



THE OHIO STATE UNIVERSITY

A photograph showing a collection of large, orange pumpkins, likely the 'Autumn Buckskin' variety, growing in a field. The pumpkins are covered in some dirt and have prominent stems. A white label is placed on one of the pumpkins in the center of the frame.

**67. Autumn
Buckskin**



THE OHIO STATE UNIVERSITY



**69. Cinderella's
Carriage**



THE OHIO STATE UNIVERSITY



Charmed (ACX 7301)	New Abbott & Cobb Varieties	Magical (ACX 7302)
20 lbs/ fruit 16 tons/A	17 lbs/ fruit 18 tons/A	14 lbs/fruit 14 tons/A
70% marketable		77% marketable



Large Types



- 30 lbs/fruit
- 19 tons per/A
- Thick handles
- Large slightly upright type
- 70% marketable





Phatso
Jr.



Phatso
II

Both Phatso
varieties are great.

27-30 lbs/fruit
20 tons/A

Thick handles
Nice round shape
75% marketable



**Solid
Gold**



25 lbs/fruit

Smooth skin with broad ribbing

15 tons per/A

Nice shape and good color

78% marketable





Magic Wand

(HMX 6686)

- Consistent Quality
- 13 tons per acre.
- 18 lbs per fruit
- **Good PMT**
- 76 % marketable



27 lbs/ fruit
16 tons/A

From Hollar seed - makers of Camero
PMR.

Better pumpkin color.
63% marketable



APOLLO F1

(HMX 9699)

Large pumpkin

Exciting new
large size
pumpkin

FEATURES

- ALADDIN TYPE WITH MEDIUM DARK ORANGE COLOR
- 18 TO 32 LB
- MEDIUM RIBBING
- IMPROVED HANDLE SIZE & HANDLE ATTACHMENT



Relative Maturity	Plant Habit	Handle	Height	Diameter	Weight	Shape	Color
Early	Semi-vine vigorous	Large, well attached medium length	14 in	12in	18-32 lbs	Round to upright	Dark Orange

DISEASE RESISTANCE CHART (HR=High Resistance, IR=Intermediate Resistance)

HR/IR	Common name	Abbreviation	Pathogen / Causal Agent
IR	Powdery Mildew	Px	<i>Podosphaera xanthii</i>

KRATOS

(HMX 3695)

Large Pumpkin

Strong,
powerful
pumpkin

FEATURES

- LARGE, FIRMLY ATTACHED HANDLE
- STRONG VINE
- GOOD YIELD, GROWER FRIENDLY



Relative Maturity	Fruit Height	Fruit Diameter	Fruit Weight	Fruit Shape	Exterior Color
100 days	14"	13"	20-30lbs	Flat-round	Medium dark orange

DISEASE RESISTANCE CHART (HR=High Resistance, IR=Intermediate Resistance)

HR/IR	Common name	Abbreviation	Pathogen / Causal Agent
IR	Powdery Mildew	Px	<i>Podosphaera xanthii</i>

ARES

(HMX 1689)

Large, upright

Tall, strong
warrior

FEATURES

- LARGE, FIRMLY ATTACHED HANDLE
- UNIQUE UPRIGHT SHAPE
- EXCELLENT YIELD POTENTIAL
- 22-28 POUND AVERAGE
- UNIFORM SHAPE AND SIZE



Relative Maturity	Fruit Height	Fruit Diameter	Fruit Weight	Exterior Color
115 days	16"	12"	22-28lbs	Medium dark orange

DISEASE RESISTANCE CHART (HR=High Resistance, IR=Intermediate Resistance)

HR/IR	Common name	Abbreviation	Pathogen / Causal Agent
IR	Powdery Mildew	Px	<i>Podosphaera xanthii</i>

Rhea F1

(HMX 0688)

Medium pumpkin

A beautiful
pumpkin that
has a handle to
match!

FEATURES

- CONSISTENT YIELDING AND BROADLY ADAPTED PUMPKIN
- LARGE VIGOROUS VINE
- DARK ORANGE COLOR WITH WELL-DEFINED RIBS
- LARGE, DARK, AND FIRMLY ATTACHED HANDLE
- EXCELLENT PUMPKIN FOR ROADSIDE AND SHIPPING



Relative maturity	Fruit shape	Fruit weight	Color	Handle
Main	Flat-round	20-30 lbs	Dark orange	Dark and firmly attached

DISEASE RESISTANCE CHART (HR=High Resistance, IR=Intermediate Resistance, S=Susceptible)

HR/IR	Common name	Abbreviation	Pathogen / Causal Agent
IR	Powdery mildew	Px (ex S)	<i>Podosphaera xanthii</i> (ex <i>Sphaerotheca fuliginea</i>)

Harris Moran Seeds



THE OHIO STATE UNIVERSITY

GLADIATOR F1 (HMX 2689)

Medium pumpkin

An exciting new pumpkin in the medium to large class



FEATURES

- GOOD YIELD
- VIGOROUS PLANT
- INTERMEDIATE RESISTANCE TO POWDERY MILDEW
- FITS ROADSIDE MARKETING
- EXCELLENT COLOR

Relative Maturity	Plant Habit	Handle	Fruit Size	Fruit weight	Exterior Color
Main	Vigorous	Large, strongly attached	14 x 12	15-25 lb	Excellent

DISEASE RESISTANCE CHART (HR=High Resistance, IR=Intermediate Resistance)

HR/IR	Common name	Abbreviation	Pathogen / Causal Agent
IR	Powdery Mildew	Px	<i>Podosphaera xanthii</i>

MAGIC LANTERN F1 (HMX 5683)

Medium pumpkin

Fancy fruit & high yields



FEATURES

- ATTRACTIVE, CLASSY APPEARANCE
- UPRIGHT SHAPE, CLASSIC COLOR AND LOOK
- HIGH YIELD POTENTIAL
- EASY HARVEST MANAGEMENT
- NICE UNIFORMITY

Relative Maturity	Fruit Height	Fruit Diameter	Fruit Weight	Fruit Shape	Exterior Color
Main	14 in	12 in	16-25 lbs	Upright	Dark orange

DISEASE RESISTANCE CHART (HR=High Resistance, IR=Intermediate Resistance)

HR/IR	Common name	Abbreviation	Pathogen / Causal Agent
IR	Powdery Mildew	Px	<i>Podosphaera xanthii</i>

Harris Moran Seeds

MAGIC WAND F1 (HMX 6686)

Medium pumpkin

Fancy fruit and high yields



FEATURES

- ATTRACTIVE, CLASSY APPEARANCE
- UPRIGHT SHAPE, CLASSIC COLOR AND LOOK

Relative Maturity	Fruit Height	Fruit Diameter	Fruit Weight	Fruit Shape	Exterior Color
Main	14 in	12 in	16-25 lb	Upright	Dark Orange

MAGICIAN F1 (HMX 0683)

Medium pumpkin

Gorgeous round pumpkin with high yields



FEATURES

- INTERMEDIATE RESISTANCE TO ZUCCHINI YELLOW MOSAIC VIRUS AND POWDERY MILDEW
- MEDIUM SIZE CLASS 8-16 LBS
- EXCELLENT ORANGE COLOR
- ROUND SHAPE
- HIGH YIELDS

Relative Maturity	Fruit Height	Fruit Diameter	Fruit Weight	Fruit Shape	Exterior Color
Main	12 in	10 in	10-16 lb	Round	Orange

DISEASE RESISTANCE CHART (HR=High Resistance, IR=Intermediate Resistance)

HR/IR	Common name	Abbreviation	Pathogen / Causal Agent
IR	Powdery Mildew	Px	<i>Podosphaera xanthii</i>
IR	Zucchini Yellow Mosaic	ZYMV	<i>Zucchini yellow mosaic virus</i>



THE OHIO STATE UNIVERSITY

LITTLE GIANT

Little pumpkin with giant size appeal!

FEATURES

- SMALL PIE PUMPKIN WITH A VERY ATTRACTIVE UNIFORM SHAPE
- LONG HANDLE MAKES IT IDEAL FOR SCHOOL FIELD TRIP TOURS
- VERY DARK ORANGE COLOR WITH DARK GREEN HANDLE
- FEATURES A SEMI-VINE PLANT HABIT AND HIGH YIELDS



Maturity	Plant Habit	Height	Diameter	Weight	Shape	Color
Mid/early	Semi-vine	5-6in	5-6in	2-4lb	Round	Dark orange

DISEASE RESISTANCE CHART (HR=High Resistance, IR=Intermediate Resistance)

HR/IR	Common name	Abbreviation	Pathogen / Causal Agent
IR	Powdery mildew	Sf	<i>Sphaerotheca fuliginea</i>

CANNON BALL F1

Small pumpkin (HMX 3694)

Attractive and uniform small pumpkin

FEATURES

- IDEAL FOR KIDS
- VIGOROUS PLANT
- GOOD YIELDS
- ATTRACTIVE DARK ORANGE COLOR WITH HEAVY FRUITS
- FIRMLY ROOTED LARGE HANDLE



Relative Maturity	Fruit Weight	Fruit Shape	Exterior Color
Main	5lb	Round	Dark orange

DISEASE RESISTANCE CHART (HR=High Resistance, IR=Intermediate Resistance)

HR/IR	Common name	Abbreviation	Pathogen / Causal Agent
IR	Powdery Mildew	Px	<i>Podosphaera xanthii</i>

Harris Moran Seeds

MISCHIEF

Perfect size for both chain stores and roadside stands.

- Can be carved or painted
- Very high yields of highly uniform fruit
- Dark orange with a dark, strongly attached handle



FIELD TRIP F1

(HMX 6687)

Small pumpkin

Perfect for school pumpkin patch

FEATURES

- DISTINCTIVE LONG HANDLE
- FLAT AND RIBBY
- VERY UNIFORM IN SHAPE AND
- INTERMEDIATE RESISTANCE TO POWDERY MILDEW



Relative Maturity	Fruit Weight	Fruit Shape	Exterior Color
Early	5-7lb	Round Flat	Deep orange

DISEASE RESISTANCE CHART (HR=High Resistance, IR=Intermediate Resistance)

HR/IR	Common name	Abbreviation	Pathogen / Causal Agent
IR	Powdery Mildew	Px	<i>Podosphaera xanthii</i>

3-5 lb, IR, Tall round, Orange



THE OHIO STATE UNIVERSITY

Wholesale vs. Retail



- Wholesale – pumpkins as a commodity for someone else to sell (truck or trailer load)
 - Price range 10-15 cents / lb (\$200-\$300 / ton)
- Retail – sell direct to the consumer
 - Store, Garden center, Direct Farm Market, Farmers Market, etc.
 - Price range 30-45 cents / lb
- Agri-tainment
 - Buy wholesale, sell retail
 - Right location, foot traffic, marketing, advertising, build repeat customers
 - Hay rides, Catapult, Petting zoo, Corn maze, Zip line, etc.



Spectrum of Pumpkin Pests

• Key Diseases:

- Powdery mildew
- Bacterial wilt
- Phytophthora
- Fusarium
- Plectosporium
- Angular leaf spot
- Anthracnose
- Downy mildew
- Yellow vine decline
- Virus (WMV), others

• Key Insects:

- Striped cucumber beetles/larvae
- Corn rootworm beetles/larvae (West. & South.)
- Squash bug
- Squash vine borer
- Aphids

• Key Weeds:

- Pigweed
- Marestail
- Cocklebur
- Lambsquarters
- Black nightshade
- G./C. Ragweed
- Velvetleaf
- Grasses (foxtail, barnyard, etc.)



NCR Pumpkin Survey



- In 2007, the GLVWG conducted a Pumpkin IPM adoption survey
- 194 growers across the Great Lakes region
- **“What is the most challenging aspect of producing pumpkins?”**
- 52% **disease** management
- 18% weed management
- 14% insect management
- 26% other / misc.



Highlights of Disease Management



- **Key General Tactics:**
- Crop rotation – 3 yr minimum (pumpkin, x, y)
- Select disease tolerant hybrids when possible
 - Nothing for bw, phytophthora, fusarium, plectosporium, DM
- Cover crops (winter rye)
 - prevent splash and soil to fruit contact, clean fruit
- Scout: disease presence dictates treatment options
- Proper fungicide selection & timing (7-14 days)
 - Rotate FRAC #s to delay resistance
 - 60+ PSI, 35 GPA+, Hollow cone nozzles



Highlights of Insect Management



- **Key General Tactics:**
- Crop rotation - 3 yr minimum (pumpkin, x, y)
- Time of planting or transplanting
 - Early - Striped Cuke Beetle/Bacterial wilt (DS)
 - Later - Aphids/Virus (DS/Transplant)
- Insecticide seed treatment (Farmore) < residue in pollen and nectar compared to in-furrow or drench
- Frequent scouting at seedling stage, treat if threshold is exceeded
 - Cotyl-1st (0.5 btl), 2nd-3rd (1 btl), 4th or more (2 btl)
- Treat if rind feeding is observed



Highlights of Weed Management



- **Key control tactics:**
- Crop rotation - 3 yr minimum (pumpkin, x, y)
- Site selection, well drained soil
 - Choose fields with low weed pressure
- No-till or minimum till combined w/ cover crops
- Stale seedbed (till, wait, plant, spray)
- Cultivate fields for weeds/hand hoe/pull
- Use of Premerge and Post (spot spray) programs
 - Broadleaf weeds and Grasses
- Weed control will impact your disease control

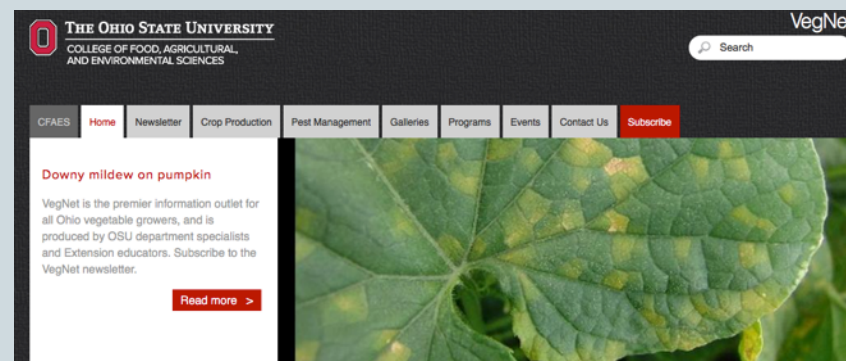


Current Sources of IPM Information

- VegNet Newsletter
 - Updated weekly through the season



- VegNet.OSU.EDU
 - Archived reports, pictures

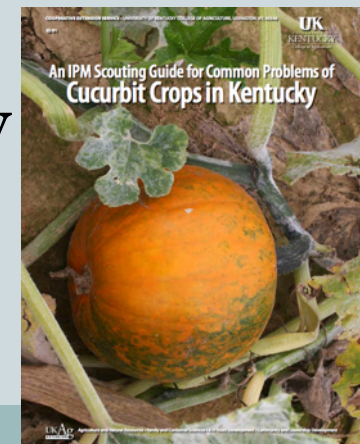
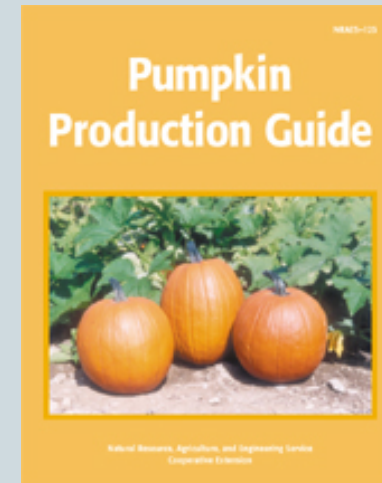


- Midwest Vegetable Production Guide
 - Updated annually by OSU & regional specialists



Pumpkin IPM Publications

- Identifying and Managing Cucurbit Pests (IL) \$11
- Pumpkin Production Guide (NRAES-123) \$39
- IPM Scouting Guide for Common Problems of Cucurbit Crops in Kentucky -pdf




Current Pumpkin Field Days

Pumpkin Field Days

- Western Ag Research Station
 - South Charleston
 - Mid August
- South Centers at Piketon
 - End of September – Mid October
- Questions?
 - Jasinski.4@osu.edu
 - 937-484-1526



OHIO STATE UNIVERSITY EXTENSION




PUMPKIN / UAV FIELD DAY

TOPICS:
UAV and Imagery basics
Update on UAV / Downy & Powdery mildew project
UAV flight & mapping demonstration
Insect update
Disease update
8 Powdery mildew fungicide demonstration plots
12 Powdery mildew tolerant/resistant hybrids variety trial

PRESENTERS:
Logan Dyer
John Fulton
Sally Miller
Claudio Wisman
Lisa Fiorentini
Jim Jasinski
Wladimiro Villarreal
Celeste Welty

**THURSDAY
AUG. 18TH
6 - 8 P.M.**

Western Ag Research Station
7721 South Charleston Pike,
South Charleston, OH 45368
Cost: \$5 / person
Pre-register by August 15th
send email to:
Jasinski.4@osu.edu

 **THE OHIO STATE UNIVERSITY**
COLLEGE OF FOOD, AGRICULTURAL
AND ENVIRONMENTAL SCIENCES

CFAES provides research and related educational programs to clientele on a nondiscriminatory basis. For more information: go.osu.edu/afesdiversity

