

# Chapter 36.

## Radish Production in Florida

D.N. Maynard, G.J. Hochmuth, C.S. Vavrina, W.M. Stall, T.A. Kucharek, S.E. Webb

### BOTANY

#### Nomenclature

**Family** - Brassicaceae (Cruciferae)

**Radish** - *Raphanus sativus*

#### Origin

Radish is believed to be native to China.

#### Related Species

Virtually every plant part is consumed across the various vegetables in the Brassicaceae family. Other root crops are horseradish, turnip, and rutabaga. The stem is utilized from kohlrabi. Leaves of mustard, kale, collards, and watercress are food sources. Cabbage and Brussels sprouts vegetative buds are consumed, while the reproductive buds of broccoli and cauliflower are the plant parts used.

### VARIETIES

Some radish varieties grown in Florida are:

Fireball (H)

Fuego

Red Silk

### SEEDING AND PLANTING

Planting dates and seeding information are given in Table 1.

### FERTILIZER AND LIME

For mineral soils, broadcast all P<sub>2</sub>O<sub>5</sub>, micronutrients, and 25 to 50% of N and K<sub>2</sub>O. Topdress remaining N and K<sub>2</sub>O 10 to 15 days after seeding. Amount of P fertilizer should be satisfactory for up to three crops. K amount is for each crop.

For Histosol soils, broadcast all fertilizers. Supplemental N at a rate of 30 lbs/A might be needed in cool winter weather or after leaching rain.

Soil test and fertilizer recommendations for mineral soils are given in Table 2. Soil test and fertilizer recommendations for Histosols are given in Table 3.

### IRRIGATION

Radish water requirements (see Chapter 8, *Principles and Practices for Irrigation Management of Vegetables*, Table 4 to 6) may be less than other root crops. Peak water use during rapid growth and development will be about 80% of ETo. Water requirements will decrease to around 75% of ETo during the latter stages of plant growth (see Chapter 8, *Principles and Practices for Irrigation Management of Vegetables*, Table 3).

### WEED MANAGEMENT

At this time, there are no preemergent or postemergent herbicides labeled for radish grown on organic soils. DCPA (Dacthal W-75) and several trifluralin labels are registered for use on mineral soils. Glyphosate may be used preplant in a cropping system scheme. Clethodim (Select) now is labeled for use for the postemergence control of grasses.

Preparing a good clean seedbed is very important in radish production. In many cases, the radish may emerge, grow, and be ready for harvest before competing weeds germinate and cause a problem in growth and harvest of the crop.

Several herbicides are now being evaluated in the IR-4 system to establish tolerances for radish on muck soils as well as the Chinese radish (Daikon) on both organic and mineral soils.

**Table 1.** Seeding and planting information for radish.

Planting dates	
North Florida	Sept - Mar
Central Florida	Sept - Mar
South Florida	Oct - Mar
Seeding information	
Distance between rows (in)	6
Distance between plants (in)	1
Seeding depth (in)	0.25
Seed per acre (lb)	10 - 20
Days to maturity from seed	20 - 30
Plant population <sup>1</sup> (acre)	1 million +
<sup>1</sup> Population based on closest between and within row spacing.	

## PLANT TISSUE ANALYSIS

Plant tissue analysis information for radish is given in Table 4. The analysis was done near harvest, using the most recently matured leaf.

## INSECT MANAGEMENT

Table 6 outlines the insecticides approved for use on insects attacking radish.

## DISEASE MANAGEMENT

Chemicals approved for disease management in radish are shown in Table 5.

**Table 2.** Soil test and fertilizer recommendations for mineral soils for radish.<sup>1</sup>

Target pH	N lb/A	$P_2O_5$					$K_2O$				
		VL	L	M	H	VH	VL	L	M	H	VH
(lb/A/crop season)											
6.5	90	120	100	80	0	0	120	100	80	0	0

<sup>1</sup> See Chapter 2 section on supplemental fertilizer application and best management practices, pg 11.

**Table 3.** Soil test and fertilizer recommendations for Histosol soils for radish, with target pH = 6.5 and N rate = 0 lb/A.

P and K index and fertilizer rate				
P index	3	6	9	12
$P_2O_5$ (lb/A)	100	40	0	0
K index	50	80	110	140
$K_2O$ (lb/A)	100	40	0	0

**Table 4.** Plant tissue analysis near harvest for radish. Dry wt. basis.

Status	N	P	K	Ca	Mg	S	Fe	Mn	Zn	B	Cu	Mo
	Percent						Parts per million					
Deficient	<3.0	0.25	1.5	0.5	0.3	0.3	30	20	30	15	3	0.1
Adequate range	3.0-4.5	0.25-0.4	1.5-3.0	0.5-2.0	0.3-0.5	0.3-0.6	30-50	20-40	30-50	15-30	3-10	0.1-2.0
High	>4.5	0.4	3.0	2.0	0.5	0.6	50	40	50	30	10	2.0
Toxic										>85		

**Table 5.** Disease management for radish.

Chemical	Maximum Rate/Acre/ Application	Crop	Minimum Days to Harvest	Pertinent Diseases	Select Remarks
Ridomil Gold/Copper 64.8 W	2 lbs		7	Downy mildew	Limit is 4 appl/crop.
Ridomil Gold EC	2 pts/trtd acre			Pythium seedling blight, Downy mildew	Apply at seeding on soil over seed furrow.
Amistar 80 DF	5 ozs	20 ozs	0	Downy mildew various	Limit is 1 sequential application and 4 total per crop.
Cabrio 2.09	16 fl oz	48 fl oz	0	Downy mildew various	3 appl. Limit /crop. 2 sequential applications

**Table 6.** Insecticides approved for use on insects attacking radishes.

Chemical	REI (hours)	Days to Harvest	Insects	Notes
Admire 2F (imidacloprid)	12	21	aphids, flea beetles, leafhoppers, whiteflies	Limited to one soil application.
Agree WG ( <i>Bacillus thuringiensis</i> subspecies <i>aizawai</i> )	4	0	lepidopteran larvae (caterpillar pests)	Apply when larvae are small for best control. OMRI-listed.
*Asana XL .66 EC (esfenvalerate)	12	7	armyworms, beetles	Do not apply more than 0.1 lb active ingredient per acre per season.
Aza-Direct (azadirachtin)	4	0	aphids, beetles, caterpillars, leafhoppers, leafminers, mites, stink bugs, thrips, weevils, whiteflies	Antifeedant, repellent, insect growth regulator. OMRI-listed.
*Baythroid 2 (cyfluthrin)	12	0	cutworms, flea beetles	Maximum applications per crop: 5. Do not consume tops.
Biobit HP ( <i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i> )	4	0	caterpillars (will not control large armyworms)	Treat when larvae are young. Good coverage is essential. Can be used in the greenhouse. OMRI-listed.
BotaniGard 22 WP, ES ( <i>Beauveria bassiana</i> )	4	0	aphids, thrips, whiteflies	May be used in greenhouses. Contact dealer for recommendations if an adjuvant must be used. Not compatible in tank mix with fungicides.
Condor ( <i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i> )	4	0	caterpillars	Do not use in combination with any chlorothalonil-based fungicides. Use caution when mixing with other oil-based products or surfactants. Treat when larvae are young. Good coverage is essential.
Crymax WDG ( <i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i> )	4	0	caterpillars	Use high rate for armyworms. Treat when larvae are young.
Deliver ( <i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i> )	4	0	caterpillars	Use higher rates for armyworms. OMRI-listed.
*Diazinon AG-500, *4 E, *50 W (diazinon)	24	14 preplant	aphids, dipterous leafminers, flea beetles cutworms, mole crickets, wireworms	Do not make more than 3 foliar applications.
DiPel DF ( <i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i> )	4	0	caterpillars	Treat when larvae are young. Good coverage is essential.
Extinguish ((S)-methoprene)	4	0	fire ants	Slow-acting IGR (insect growth regulator). Best applied early spring and fall where crop will be grown. Colonies will be reduced after three weeks and eliminated after 8 to 10 weeks. This is the only fire ant bait that is labeled for use on cropland. May be applied by ground equipment or aerially.
Javelin WG ( <i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i> )	4	0	most caterpillars, but not <i>Spodoptera</i> species (armyworms)	Treat when larvae are young. Thorough coverage is essential. OMRI-listed.
*Lannate SP (methomyl)	48	3	beet armyworm	SLN [24(c)] label for Florida.

Table 6. Continued.

Chemical	REI (hours)	Days to Harvest	Insects	Notes
Lepinox WDG ( <i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i> )	12	0	for most caterpillars, including beet armyworm (see label)	Treat when larvae are small. Thorough coverage is essential.
Lorsban 15 G, *4 E (chlorpyrifos)	24	at planting	root maggot	One application per season.
Malathion 5 EC; 8 F (malathion)	12	7	aphids, diamondback moth, flea beetles, leafhoppers	
M-Pede 49% EC Soap, insecticidal	12	0	aphids, leafhoppers, mites, thrips, whiteflies	
Neemix 4.5 (azadirachtin)	12	0	aphids, armyworms, beetles, caterpillars, leafhoppers, leafminers, thrips, whiteflies	Does not kill adult insects. IGR and feeding repellent. OMRI-listed.
Provado 1.6F (imidacloprid)	12	7	aphids, flea beetles, leafhoppers, whiteflies	One application per season.
Pyrellin EC (pyrethrin + rotenone)	12	12 hours	aphids, leafhoppers, leafminers, loopers, mites, plant bugs, thrips, whiteflies	
Sevin 80S; XLR; 4F (carbaryl)	12	7	armyworms, aster leafhopper, corn earworm, fall armyworm, flea beetle, harlequin bug, imported cabbageworm, leafhoppers, stink bugs, tarnished plant bug	
Sevin 5 Bait (carbaryl)	12	7	ants, cutworms, grasshoppers, mole crickets, sowbugs	
SpinTor 2 SC (spinosad)	4	3	armyworms, flea beetle, leafminers, loopers, thrips	Do not apply more than 18 oz/acre per crop. Limited to 3 applications per year.
Sun Spray 98.8%, others Oil, insecticidal	4	0	aphids, leafhoppers, leafminers, mites, thrips, whiteflies	
*Telone C-35 (dichloropropene + chloropicrin)	5 days - See label	preplant	symphylans, wireworms	
Trilogy (extract of neem oil)	4	0	aphids, mites, suppression of thrips and whiteflies	Apply morning or evening to reduce potential for leaf burn. Toxic to bees exposed to direct treatment. OMRI-listed.
Xentari DF ( <i>Bacillus thuringiensis</i> subspecies <i>aizawai</i> )	4	0	caterpillars	Treat when larvae are young. Thorough coverage is essential. May be used in the greenhouse. Can be used in organic production.

The pesticide information presented in this table was current with federal and state regulations at the time of revision. The user is responsible for determining the intended use is consistent with the label of the product being used. Use pesticides safely. Read and follow label instructions.

OMRI listed: Listed by the Organic Materials Review Institute for use in organic production.

\* Restricted Use Only.