

Small Fruit News

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Do you know what fungal pathogens do in the winter?

Madeline Dowling and Dr. Guido Schnabel,
Clemson University

“Chestnuts may be roasting over the open fire and Jack Frost may be nipping at your nose,” but that doesn’t mean small fruit diseases are taking a break. Wintertime is generally a less busy season for growers, and many of us can take some much-needed rest. However, even during the winter, diseases such as gray mold and anthracnose can still be active. Most of the time, gray mold “hibernates,” curling itself up into tiny balls of fungus (sclerotia) and

waiting until spring rains revive it. But, liking variety, it has several other ways to spend the winter. It, and other diseases like anthracnose, can take a vacation from your crops to infect weeds just outside the field. Gray mold and anthracnose can also survive in old plant debris from the previous year underneath plants and between rows. Most devastating for growers of strawberries and other annual plants, these diseases can form invisible infections on nursery plants that do not show up until they are well established. All of these sources maintain gray mold and anthracnose pathogens, enabling next season’s infections to take place.



Photo credit: Betty Nudler via Flickr

So how can we prevent pathogens from having a happy winter season that will result in losses next spring and summer? One method for small fruit crops where gray mold and anthracnose are problematic is to manage weeds both inside and outside the field year-round. For perennial crops, like blackberries and grapes, removing debris underneath plants before or during the winter, and burning,

composting, or burying it will destroy some of the disease culprits left in the field. For annual crops, like strawberries, making sure all of the past year's debris is plowed under is useful, and it is a good idea to spread the risk and order from more than one reputable nursery to keep diseases at bay.

Hopefully these tips will help keep your fields healthy next year. Enjoy your winter's break, and have a Happy New Year!

Summary of *Botrytis* Fungicide Resistance in 2016-2017

Mengjun Hu and Guido Schnabel
Clemson University

Botrytis cinerea is the causal agent of gray mold, which is one of the most important fungal diseases on small fruits. In the absence of resistant cultivars and frequent weather conditions suitable for disease development, fungicide spray programs are essential for preharvest and postharvest disease management.

Since 2011, the Schnabel lab at Clemson University has been offering a free service for small fruit growers in the Southeastern U.S. to identify ineffective and effective spray materials. Producers or agents typically send freeze-damaged strawberry flowers in early spring to the lab for analysis. Producers also may send cotton swabs with spores from infected strawberry fruit or other fruits later in the season. Lab analysis includes sample processing for spore generation, fungicide sensitivity testing on artificial media, and data analysis. After about 10 days, a report detailing results and providing resistance and disease management advice is provided. Instructions for Fungicide Resistance Profiling are available online at the 'Clemson Schnabel lab' website (www.peachdoc.com). This resistance-profiling program is free of charge for southern growers and financially

supported by commodity boards as well as the Southern Region Small Fruit Consortium.

During the 2016-2017 season, a total of 52 gray mold samples were received and processed, each represented by 10 isolates. Of the 52 samples, 49 were from strawberry (mostly flower samples but a few fruit samples), two were from grapes and the other one was from blackberry fruit (**Table 1**). In total, 438 strawberry isolates from six states, 20 grape isolates from one state, and 10 blackberry *Botrytis* isolates from one state were tested (**Table 1**). We tested for resistance to thiophanate-methyl (t-methyl; Topsin M), pyraclostrobin (one of two components of Pristine or Merivon), cyprodinil (Scala; one of two components of Switch), fenhexamid (Elevate), iprodione (Rovral), boscalid (major botryticide component of Pristine), fludioxonil (major botryticide component of Switch), penthiopyrad (Fontelis), fluopyram (major botryticide component in Luna Sensation and other Luna products), and isofetamid (Kenja). Resistance to t-methyl and pyraclostrobin was found virtually in all strawberry samples, while resistance to fludioxonil, boscalid, fluopyram, penthiopyrad or isofetamid was less frequently detected (**Fig. 1**). Resistance to boscalid and fludioxonil appeared to have been decreasing over the last year. In addition, the frequency of isolates with resistance to multiple chemical classes of fungicides appeared to have declined (data not shown). Those trends may be a result of improved resistance management at the nursery level and/or improved resistance management recommendations at the production level.

The improved resistance management program consists of a focus on thiram and captan prior to bloom and during the season. Site-specific fungicides with low resistance risk are recommended to be used with a protectant only when disease pressure is expected to be high. We also now recommend to each FRAC code to be used no more than twice per season (for

example, if you used Fontelis once and Merivon once you maxed out the 2 applications for FRAC 7 fungicides). Resistance profiles vary from farm-to-farm and year-to-year and it would be in the producer's best interest to sample gray mold populations and request the resistance profile through Clemson University every year. **Table 2** shows the active ingredients and FRAC codes of fungicides currently registered for gray mold management on strawberries. Many of them are also registered for grape production. Please use our spray guide at www.smallfruits.org and download our MyIPM smartphone app (MyIPM) for more information.

Table 1: Origin and number of gray mold samples (and corresponding isolates) collected from strawberries, grapes, and blackberries during the 2016-2017 season

	Strawberry	Grape	Blackberry
South Carolina	13 (118)		
Virginia	13 (122)		
Maryland	8 (69)		
Georgia	8 (74)	2 (20)	
North Carolina	6 (44)		1 (10)
FL	1 (11)		
Total	49 (438)	2 (20)	1 (10)

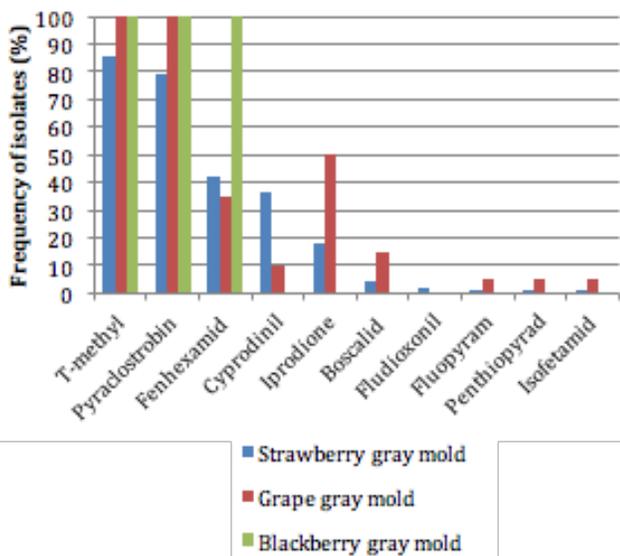


Figure 1: Frequency of isolates resistant to fungicides.

Table 2: Active ingredients and FRAC codes of fungicides used for strawberry gray mold management

	Active ingredient(s)	FRAC code(s)
Elevate	fenhexamid	17
Captevate	fenhexamid; captan	17; M4
Ph-D, OSO	polyoxin D zinc salt	19
Rovral and generics	iprodione	2
Fontelis	penthiopyrad	7
Kenja and generics	isofetamid	7
Luna Privilege	fluopyram	7
Luna Sensation	fluopyram; trifloxystrobin	7; 11
Merivon	fluxapyroxad; pyraclostrobin	7; 11
Pristine	boscalid; pyraclostrobin	7; 11
Luna Tranquility	fluopyram; pyrimethanil	7; 9
Scala	pyrimethanil	9
Switch	cyprodinil; fludioxonil	9; 12
Thiram and generics	thiram	M3
Captan and generics	captan	M4

‘Compassion’ Seedless Table Grape for Local Markets

John R. Clark
University of Arkansas

Compassion is a new seedless table grape released in 2017 by the University of Arkansas. It briefly had the name Passion, but Compassion is the name of this same grape as of early 2018. A brief description is provided, and more detailed data on performance is available.

Color- Green (white) although some amber color can develop with good light exposure. This is the fourth green grape from the Arkansas program.

Texture – Non slipskin, with a crisp texture. This is likely the most crisp texture of an Arkansas grape, the closest comparison in texture is Gratitude.

Skin – Excellent edible skin. Skin becomes most thin at full maturity, and prior to full maturity can be quite thick. Skin is non-astringent.

Flavor- Excellent. The flavor of Compassion is a blend of muscat and American *Vitis labrusca* flavors. The flavor is very pronounced, and most judge the flavor to be the most attractive of any Arkansas table grape. For an eastern US table grape, it is likely one of a kind in flavor, and with the crisp texture, it is a pinnacle of achievement in the Arkansas breeding program. Soluble solids range from 19-23%.

Berry and Clusters – Berries are naturally large (no gibberellic acid [GA] nor girdling used), average 4.5 to 5.0 g. Clusters are also large, 450 – 500 g on average and are well-filled to tight. Berries seldom develop seed traces in Arkansas. Fruit cracking following rain seldom seen in Arkansas.

Yield – Moderate, similar to Jupiter.

Ripening Date – mid season, between August 15-25 in west central Arkansas; 10-15 days after Jupiter.

Budbreak – 7-10 days later than Jupiter.

Hardiness- Winter temperatures experienced from 10-15F and was very hardy at these temperatures, but not well tested in colder environments; should be evaluated for hardiness in colder climates.

No evaluations have been done for effects of GA, girdling, bud fruitfulness or other aspects of management. Vines were grown on a high bi-lateral cordon and spur pruned during evaluation of Compassion. Vines have exhibited excellent health in Arkansas with routine fungicide spray applications; occasional powdery mildew and downy mildew seen in some years.

Compassion is available in limited supply for winter and spring of 2018 from:

Double A Vineyards
10277 Christy Road
Fredonia, NY 14063

Phone / Fax (716) 672-8493 | (716) 679-3442



Photos: Compassion table grape clusters; from clusters largely shaded (top) to more sun exposed (bottom).

Learning About Chilling in Blackberries, the Hard Way

John R Clark
University of Arkansas

Blackberries have chilling requirements similar to other fruit crops, although overall the understanding of chilling, including variety differences, is often not as clear as some species. Where I work in blackberry breeding at the University of Arkansas, over 1000 hours of chilling are received each year, and differentiation of chilling among varieties is not easy. Time of budbreak reflects chilling to some extent, but I have not found this to be fully reliable. Therefore, determining chilling requirement is often done by planting in sites with different chilling levels.

As blackberry production expanded substantially in the mid 2000s in southern Georgia, chilling requirement of Arkansas blackberries became more important. The region traditionally receives 400-500 hours or more, and this is adequate for the varieties planted there including Ouachita, Natchez, Osage, Arapaho, and Prime-Ark® 45. In 2016 and 2017, unusually low chilling occurred in the region and this impacted budbreak, bloom time, fruit maturity date, and yields. Two sites in the region, Southern Grace Farms (owned by Steve and Tim McMillan) located near Enigma, GA and Strickland Farms and Patton Farms (owned by Ben Strickland and Michelle Patton) near Lakeland, GA were examined carefully for chilling and plant performance. The estimated chilling for these sites was:

- Enigma, approx. 400 h in 2016, 300 h in 2017
- Lakeland, approx. 340 in 2016, 225 h in 2017

Even though these locations are only 30 miles from each other, chilling in these years was about 60 to 75 hours different between locations.

Primary Varieties at Enigma were Ouachita and Osage, and at Lakeland were Ouachita, Osage, and Prime-Ark® 45.

The overall estimated resulting total crop in these years at each location was:

- Enigma, 90% in 2016, 85% in 2017
- Lakeland, 100% in 2016; 64% in 2017

In 2016, budbreak was delayed and was uneven, plants seemed to “catch up” in development as the bloom and fruit development progressed, there was possibly some compensation in berry size for buds that did not break, and the season ended up pretty much normal as far as harvest time and overall crop. There were no distinct or conclusive differences among varieties in budbreak or chilling observed, at least by the end of harvest.

In 2017, differences in crop and performance were seen between the locations. At Enigma, Osage was observed to have an estimated 100% crop and Ouachita 80% crop. The ripening of the crop was delayed to some extent, but harvest season was not excessively long, or “stretched out.” At Lakeland, Osage and Prime-Ark® 45 had 100% crop. Ouachita had a 50-60% crop, budbreak was more impacted, and the harvest season was long and stretched out with harvest extended until late July or 3-4 weeks later than normal. It appeared the Ouachita plants developed or produced secondary buds that broke later than normal and had a more elongated flower cluster (this is seen at times with primary bud injury due to cold).

These experiences helped provide additional information on chilling requirement on varieties. Ouachita is the oldest of the group, and has been thought to have a 400-450 hour chilling requirement. This was generally confirmed in 2016 and 2017, with a distinct negative impact from the 225 hours received in 2017 at

Lakeland. Osage chilling requirement was not really known (is newer), although there had been some observations of lower chilling requirement than Ouachita. It appears that Osage has a 200-300 hour requirement. This is beneficial to know when considering planting a variety to hedge against years when chilling could be limiting in southern Georgia, and also suggests this could be a variety to consider into northern Florida. Prime-Ark®45, although a primocane fruiter, produces a substantial floricanes crop when primocane fruiting does not occur (due to heat) as in southern Georgia. It is estimated from 2017 that this variety could have a requirement of near 150 h (on floricanes), and is another choice for consideration of a low-chill variety.

We learn a lot by our experiences particularly in watching plants perform with substantial variation from normal in the environment. Noting these experiences in 2016 and 2017 has provided a little more knowledge on variety differences in reduced-chill years. Special thanks are expressed to Ben Strickland and Steve and Tim McMillan for their observations and comments for these years.

Grape Chores

Cain Hickey
University of Georgia

Given the recent cold weather the southeastern US has been experiencing, I think it's safe to say that the vines are dormant. In many cases, vines may be at their peak dormancy here in the southeastern US, which means vine tissues are at their peak ability to tolerate cold temperatures. However, warmer weather is on the near horizon. Let's hope we don't get into a roller coaster pattern of extreme cold-warm-extreme cold; these patterns can cause the vines to prematurely de-acclimate, which increases the chance of cold injury to vine tissues. The following grape chores will last through March/April, when the

next Small Fruits newsletter will be released through the Southern Region Small Fruit Consortium website (www.smallfruits.org). ***A special thanks to Wayne Mitchem, weed extension specialist at North Carolina State University, and Phil Brannen, fruit pathology extension specialist at the University of Georgia, for their inputs on chores 9 and 10, respectively.***

1. **Put together your final vines orders into nurseries.** Chances are you will not get the exact cultivar/rootstock/quantity combination you desire, but you may find some of what you are looking for. Don't wait any longer on this. In fact, now is a good time to put your vine order into nurseries for your 2019 plantings.
2. **Evaluate trellis integrity and repair.** Check for broken posts and trellis wires and repair or replace them before bud break. The weight of the forthcoming season's crop needs supported, and this will not be a problem with a fully-serviced trellis system.
3. **Reflect on the previous season and talk to your regional colleagues – both industry members and extension personnel.** What went right? What went wrong? Be prepared for next season by developing a plan to fix the “wrongs” and re-implementing the management strategies that worked well. It helps to talk to neighbors and ask them their take on their season – they may offer advice and answer questions that will put you in a better position for success next year, and vice-versa.
4. **Attend meetings, conferences, and workshops.** The “big” statewide viticulture and enology conferences throughout the southeastern US (Georgia, North Carolina, Virginia) are

coming up in the very near future. Further, the larger, nationally-attended conferences are also coming up. Go to these to learn and network and be a supportive industry member. Here are the events that are happening in the near future:

CONFERENCES/TRADE SHOWS/SYMPOSIUMS

- a. Georgia Wine Producers Conference (January 23-24, 2018)
www.georgiawineproducers.org/2018-annual-meeting/
- b. North Carolina Winegrower's Association Conference (February 2-3, 2018)
<http://www.ncwinegrowers.com/>
- c. Virginia Vineyards Association Winter Meeting (February 22-24, 2018)
<http://www.virginiavineyardsassociation.com/2018/01/2018-winter-technical-meeting-registration/>
- d. Unified Symposium (January 23-25, 2018)
<https://www.unifiedsymposium.org/>
- e. Eastern Winery Exposition (March 6-8, 2018)
<https://easternwineryexposition.com/>

WORKSHOPS

- f. Keep your eyes peeled on the UGA Extension Viticulture Blog (<http://blog.extension.uga.edu/viticulture/>) for more information on the following workshops to be held throughout the winter and spring in Georgia:
 - i. Pruning workshop – February 8, 2018.
 - ii. Development of a growth stage-based spray management program – March 14, 2018.
 - iii. Spray technology workshop featuring Andrew Landers – April 26, 2018.

5. Evaluate cold injury in vine tissues.

The closer to final pruning that tissue cold damage can be evaluated, the

better, as bud and wood retention can be adjusted accordingly to retain undamaged, healthy tissues. In practicality, this may mean that cold damage is evaluated before starting to prune each block or cultivar. It is impractical to wait until March to begin pruning in attempt to make it past the periods of greatest cold temperature threat. Double, or “rough”, pruning (discussed below) is a good strategy to retain several buds before needing to make final pruning decisions. Using a razor blade to cut a transect across buds will allow visual inspection of primary, secondary, and tertiary bud damage. For more on evaluation of grapevine tissue cold injury, please see the following resources:

<https://extension.umd.edu/learn/understanding-grapevine-bud-damage>
<http://articles.extension.org/pages/63372/cold-injury-in-grapevines>
www.hort.cornell.edu/goffinet/Anatomy_of_Winter_Injury_hi_res.pdf

6. **Dormant pruning.** For those who practice spur pruning, “rough pruning” is a way to get a head start on final pruning. Many of already started this, perhaps in 2017. If rough pruning is practiced and brush is pulled from the trellis wires, the final prune will be a breeze as the short spurs will simply fall out of the trellis onto the vineyard floor. Rough pruning to 4-5 node-spurs allows the grower to delay the final prune to late winter / early spring to assess bud damage and the risk of spring frost. Some “delay prune” by waiting until late winter / early spring before even starting to prune. This is an attempt to force bud break on the apical bud positions of the dormant cane before those on the basal positions, hence potentially reducing the risk of spring frost damage to the basal buds (i.e. those that will be retained). We have seen mixed reviews

with delayed pruning as it puts growers “behind the eight ball” to finish pruning while several other seasonal tasks are getting underway – it always comes on too fast! Further, it has been reported that delaying pruning well into the spring can result in the failure of some basal buds to break at all, which negates the reason for practicing delayed pruning in the first place.

If cane pruning, there is not much logic in delayed pruning, and *certainly* not much logic in “rough pruning” (i.e. don’t prune the canes you intend to lay out!). Cane pruning is becoming more popular in recent times. These trends are perhaps due to the reduced need to shoot thin when cane pruning when compared to spur pruning (the latter of which can result in numerous unfruitful shoots from the cordon-spur junction). Cane pruning also removes grapevine wood which has potentially been infected with wood diseases. This brings up a note on when to replace cordons. The easy answer is “whenever you are unhappy with the performance and health of your current cordon,” mainly as related to disease incidence and the height and spacing of your current spur positions. In general, it is time to lay down a new cordon (a “cane” in the first year) if there are several instances where adjacent spur positions are greater than a hand width apart and/or one-year old spurs originate from greater than 5-6” above the cordon. Further, it is important to assess for common wood diseases that are often observed in cordons, such as Eutypa dieback, etc. More on disease considerations at pruning time can be found in this document, written by Virginia Tech grape pathologist Mizuho Nita:

<https://farmcreditknowledgecenter.com/Farm-Credit-Knowledge-Center/media/Images/Disease-Consideration-at-Pruning-Time-2017.pdf>

A final note on pruning - tools. Using sharp, well designed tools helps reduce operator fatigue. Sharpen your hand pruners as necessary, and use loppers (large

pruners/shears for making larger cuts) that require relatively little exertion. These tactics will enable you and your crews to prune at optimal efficiency (hot coffee and pizza at lunch will help, too). The picture (below) shows an individual effectively making large cuts to cane prune. Note the distance between the individual’s hands and body. Only good loppers will permit such. Poorly designed, unsharpened tools require much more operator exertion and require the tools to be held closer to the body to gain leverage.



7. **Service and check active frost protection machines/equipment and be prepared to avoid spring frost.**

The most ubiquitous active frost protection method in eastern US vineyards is using a wind machine (photo, below) to mix air. Wind machines can protect 10-12 vineyard acres. Fiscal estimations suggest that wind machines can “pay for themselves” if they save the crop on only one acre if that crop is turned into wine and sold. If your site is frequently threatened by spring frost, such an investment may prove to be economically beneficial. Combining air movement with heaters or burning brush piles may offer additional protection when the 1-3 °F of protection offered by air mixing alone is anticipated to be ineffective at preventing frost damage. Other methods, such as

delayed pruning, spray materials, and irrigation may help in some instances, but each of these methods have drawbacks. For example, highly variable results have been reported regarding the effectiveness of spray materials advertised to lower frost risk through bud break delay, cryoprotection, or preventing ice nucleating bacteria.



shoot becomes lignified. If you need to use pruners to thin shoots you have waited too long. Optimal shoot density is around four shoots per linear foot of row for single-fruiting zone systems, such as VSP systems. It is impossible to count to this number throughout commercial vineyards. Thus, it is advised to thin a panel to roughly four shoots per linear foot of row and get crew members to get a mental image of what this looks like (below); they can then implement in the rest of the vineyard with good precision.



8. I'm going to briefly comment on **shoot thinning** in case the spring of 2018 ends up being like 2017, and bud break occurs earlier than normal (this was experienced here in Georgia at least). However, I'll also comment on shoot thinning again in the March/April edition of *Small Fruits*). Shoot thinning is the first "canopy management" practice of the growing season. Like most management practices, all vines need attention at the same time. To optimize efficiency, shoots should be thinned by manually by hand removal. This is best accomplished when shoots are roughly 5-7" long. Inflorescences are clearly visible at this stage, making it easy to retain fruitful, and thin unfruitful, shoots. It is NOT advised to wait on this practice, as it becomes much more difficult to efficiently thin shoots when shoots are approaching a foot in length, and the junction between the spur and

9. **Weed Control Considerations.** Herbicide programs need to be initiated in March if no fall preemergence herbicide was used. There are several programs that are very effective and depending on which preemergence herbicide you use timing of those preemergence herbicides can vary. Take a close look at your options in the Bunch Grape IPM Guide at www.smallfruits.org for some proven programs.
10. **Disease management recommendations.** Think back through disease management issues from 2017; though no two years are alike, areas of poor disease management should be addressed by thinking through potential

shortfalls in spray programs or fungicides utilized in 2017. Now is the time to develop a comprehensive spray program for 2018; any plan is virtually better than no plan, and each application for 2018 should be developed well before the season starts. Given, you should have contingency plans for wet versus dry seasons (more powerful fungicides and more applications in wet seasons), but you will need to plan well for disease and insect management issues which may arise. Order the chemical fungicides, insecticides, herbicides, etc. that you will need to have on hand for 2018. Now is also a good time to make needed repairs to tractors and spray equipment. Review nozzles and replace those that are worn. Sprayer calibration should also be conducted prior to the first application of 2018. Use water sensitive cards or dyes to address spray coverage to the critical vine areas.

Relative specific recommendations, consider an application of lime sulfur to vines which have had problems with Phomopsis. This should be applied approximately two weeks prior to bud break. When pruning, delaying pruning will help pruning wounds heal better, but this has to be balanced with the need to accomplish pruning in a timely manner with the manpower resources available. If possible, prune when 3-4 days of dry weather are predicted. At the end of each day of pruning, an application of Rally or Topsin M + Captan will help wounds to heal well and prevent infection by canker diseases such as Botryosphaeria. As soon as any green tissue is observed, apply fungicides for control of Phomopsis. From the beginning of the season, powdery and downy mildews can infect, but preboom and bloom applications are critical

infection periods; make sure to schedule the most active fungicides for these timeframes.

That's about it. We will likely be seeing some bud break in more southerly-positioned vineyards in the southeastern US by the time the next "grape chores" list is published in the March/April edition of *Small Fruits*. This will be here soon – SO GET OUT AND GET PRUNING!

If you have not already done so, please subscribe to our extension viticulture blog for updates on management, events, regional weather, etc.

<http://blog.extension.uga.edu/viticulture/>

Winter Caneberry Checklist 2017-18

This checklist was originally developed for blackberry growers in North Carolina. Many of the items apply to raspberry production as well. You may have to adjust your work activities either earlier or later depending on your location. For more detailed information, check the Southern Region Integrated Bramble Management Guide and the Southeast Regional Bramble Production Guide at: <http://www.smallfruits.org/SmallFruitsRegGuide/index.htm>.

Check the items off as they get done. This list is very general, but should help get you to think about what types of activities occur at various times of the year. If you would like other items to be added to this list, send them to me and I will add them next time.

WINTER

Plant growth and development

- Plant is not visibly growing during the winter months although many blackberries will retain their leaves through the winter
- Some differentiation is occurring in the flower buds

- Low chilling cultivars can break bud in January after adequate winter chilling. You can monitor chilling hours accumulated in eight states in the eastern US by accessing this site: [cronos/blackberry/chill_model](#)
- Developmental stages at this time of year as mentioned in the PM guide are :
1. Dormant 2. Delayed dormant (swollen bud) to green tip

Pruning and trellising

- Pruning should occur in late winter. However, in some areas winter ice storms can do tremendous damage to plants and trellis systems. If you produce blackberries in one of these areas, pruning can take place early winter to help avoid severe damage
- Make trellis repairs after plants have defoliated but before pruning and training.
- Erect types
 - Prune out the spent floricanes
 - Tie canes to wires in a fan shape
 - Cut lateral branches back to 8-12"
 - Thin canes to 6-8 canes/ hill (4 ft spacing)
- Trailing types
 - Prune out spent floricanes
 - Tie or weave canes to wire so that they do not overlap
 - Prune side laterals to 12-18"
 - Thin canes to 6-8 hill (6-8ft spacing)
- Primocane fruiting raspberries and blackberries
 - Prune (mow) primocane fruiting types to ground level

Weed control

Check the Southern Regional Bramble integrated Management Guide for recommendations. www.smallfruits.org

- Many summer weed problems can be best managed in the fall and winter

using preemergent herbicides. Determine what weeds have been or could be a problem in your area. Check with local extension agent for cultural or chemical means to control these weeds.

Insect and disease scouting

Check the Southern Regional Bramble integrated Management Guide for recommendations. www.smallfruits.org

- Scout fields for insect and disease damage and remove those canes
- Remove wild blackberries and raspberries by the roots if they are within 600 ft of your planting during the winter

Planting

- Take soil tests to determine fertility needs for spring plantings.
- There are some new raspberry and blackberry cultivars available each year. If you have not tried them or it is not know how they will do in your region, it is best to order a small quantity to see how well they will perform in your area
- For larger growers, prepare list of cultivars for 2015 plantings and order now. Smaller quantities of plants can be order in early 2014 for spring 2014 planting
- A commercial small fruit nursery lists at
 - NARBA's nursery list at www.raspberrylblackberry.com/for-growers/
 - For a comprehensive small fruit nursery list, see <https://blogs.cornell.edu/berrynurseries/>

Water management

- Make repairs to irrigation system (check pumps, lines, etc)
- Plants generally do not need supplemental water in winter

Marketing and miscellaneous

- Order containers for next season

- Make contacts for selling fruit next season

Attend grower meetings

North American Raspberry and Blackberry Association is in Ventura, CA. Feb 21-24

<http://www.raspberryblackberry.com/north-american-raspberry-blackberry-conference-2018/>

North Carolina Commercial Blackberry and Raspberry Association. Feb 13, 2018.

Meeting will be held at the Cleveland County Extension Auditorium, 130 S. Post Rd; Shelby, NC 28152. Please arrive in time to set up prior to the start of the meeting. Contact Daniel Shires for more information. (704) 482-4365

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Editor and Contributor Wayne Mitchem

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