



# Board of Forestry Meeting

**March 19, 2019**  
**Charlottesville, VA**

## Convene Meeting, Call to Order:

The Board of Forestry meeting was called to order at 9:00 a.m. by Chairman Worrell at the Headquarters Building in Charlottesville, VA. Chairman Worrell reminded the Board of the Anti-trust policy and the annual requirement to sign the acknowledgment form.

## Roll Call:

### *Board of Forestry Members Present*

Anne Beals, Don Bright, John Burke, III, Joel Cathey, Mike Hinch, Beth Flippo-Hutchins, Ken Morgan Jr., Greg Scheerer, Dr. David Smith and Glen Worrell

### *Members Absent*

Franklin Myers, Heather Richards and William Snyder

## Recognition:

Secretary Bettina Ring and State Forester Rob Farrell presented new Board member Mike Hinch with his appointment certificate and Ken Morgan with his reappointment certificate.

## Adoption of Agenda:

A request to change the terminology under State Forester's Report-Discussion of changes related to the use of the term 'forestry' to 'forester' was made. Motion was made to approve the agenda as amended; seconded. All present were in favor.

## Recognition of Guests and Visitors:

### *Virginia Department of Forestry (VDOF) Present*

Rob Farrell, State Forester; Ed Zimmer, Deputy State Forester; Terry Lasher, Eastern Regional Forester; Michelle Stoll, Director of Public Information; Dean Cumbia, Director of Forest Resource Management; Todd Groh, Forest Resource Management Program Coordinator; Mary Weaver, Executive Assistant

### *Recognition of Guests and Visitors*

Bettina Ring, Secretary of Agricultural and Forestry; Heidi Hertz, Assistant Agricultural and Forestry; Ron Jenkins, Virginia Loggers Association; Martha Moore, Virginia Farm Bureau; Susan Seward, Virginia Forest Products Association; Kurt Christensen, Landowner

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## Hearing of Citizens:

Kurt Christensen addressed his concerns with industrial solar facility installations. Solar farms are a big issue, a lot of land involved. What happens to land when they're decommissioned?

Ron Jenkins addressed his concerns with solar farms. Be diligent and thoughtful thinking about the future and lean towards biomass. Ron spoke about an effort to put logging under agricultural and the Brunswick County had its very first recognition of agriculture and timber.

The Board discussed solar farms and is there a long term impact analysis of use. Need to have a sense of responsibility for what happens in 20-30 years.

Chairman Worrell asked to move this discussion to a later time in the meeting.

Anne Beals arrived at 9:30

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## Approval of Minutes:

A motion was made to approve the August 24, 2018 minutes as presented; seconded. All present were in favor.

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## Secretary of Agriculture and Forestry (SAF) Update:

Secretary Ring discussed the following:

- ◆ New carpet in the Headquarters building along with the solar panels on the roof of the building.
- ◆ Congratulated Rob on his growing leadership team and welcomed Terry Lasher as the new Assistant State Forester.
- ◆ Legislative and budget items;
  - VDOF received \$200,000 for broadband improvements.
  - The water quality improvement funding was doubled.
  - The positions requested were not approved.
- ◆ Virginia's silviculture is a good model for other states.
- ◆ John Burke is serving on the Chesapeake Bay Advisory Board.
- ◆ The Healthy Watershed Project is in the 3<sup>rd</sup> phase. A fund is being developed to help landowners for forest retention.
- ◆ Twenty-two AFID grants have been announced since Governor Northam's been in office. Seventeen in rural areas and five forestry projects.
- ◆ Environment of Virginia and VaULT Conferences coming up. Thanks VDOF for stepping up and being sponsors.
- ◆ Black Family Land Trust hired a forester and joined the SFI Board. Meeting with the Governor in reference to the Black Family Land Trust and Generation Next initiatives.
- ◆ The 2019 Virginia Governors Agricultural Trade Conference had over 300 in attendance with over 15 countries represented. Plan to have more emphasis on forestry next year.
- ◆ The USDA trade mission will be to Vietnam and Columbia this year.
- ◆ The Governor's trade mission will be to Paris.

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## State Forester's Report:

Rob Farrell reviewed with the Board agency updates:

- ◆ General Assembly went well thanks to Katie Hellebush for shepherding the Timber Theft language changes through and to all our stakeholders for staying committed and flexible.

- Timber Theft was approved as prepared with one change; dropping the penalty down from larceny to a misdemeanor. It will take effect July 1. VDOF is working on Policies and Procedures to help landowners navigate through those changes. Also working on a signing ceremony with our partners.
- The Forester titling bill passed.
- Received \$200,000 for broadband to address some of VDOF's internet connection issues.
- Double the amount of Water Quality Improvement Fund. Will receive after July 1.
- ◆ Board of Forestry procedures are on the agenda for approval. Thanks to Frank Meyers, Don Bright and Beth Flippo-Hutchins for their assistance on those.
- ◆ Completed the agency's strategic plan. Intended to be an operational strategic plan to help us make sure we are doing things as efficiently and effectively as we can.
- ◆ Just finished VDOF's water quality audit report. The audit found that 99.13 percent of harvests have no active sedimentation after harvest was completed. It's been a very wet year for Virginia, of all the Best Management Practices (BMPs) that could have been implemented VDOF is at 94 percent. Loggers have implemented BMPs as a part of doing business, audit report reflects that.
- ◆ Story of forestry in Virginia is good story.
  - Record harvesting.
  - Growing more wood than we're harvesting.
  - High levels of Water Quality protection.
- ◆ VDOF was successful in getting the Riparian Buffer grant for Virginia Environment Endowment. VDOF's approach to riparian buffers is to look at specific property and landowner and see what it would take to get a riparian buffer that meets the landowner's needs.
- ◆ This year is the 100<sup>th</sup> anniversary of our State Forests system.
- ◆ VDOF had their first timber sale under the Good Neighbor Authority off of National Forest Land.
- ◆ Hardwood meeting with 50 stakeholders will be held on April 3 to come up with some strategies to move forward on.
- ◆ Leadership Changes:
  - Ed Zimmer will be doing the chief of operations role as the deputy state forester.
  - Recreated the assistant state forester position from the chief of operations position, which Terry Lasher now fills. Terry will be over Urban and Community Forestry, Utilization, Marketing and Economic Development and Forestland Conservation.
  - Chief of Administration, Eastern Regional Forester and Western Deputy Regional Forester are in recruit.
  - Ed Stoots moved to State Lands Coordinator and Chris Thomsen has filled the Western Regional Forester position.
- ◆ This year is Smoke Bear's 75<sup>th</sup> Birthday. VDOF was fortunate enough to produce the VDOF Fire Prevention Calendar this year. Great response to the calendar and plan to have it again next year.
  - Highlight Magazine is doing a special edition of Smokey Bear's birthday.
- ◆ Will put BMP accomplishments out as a news release for forestry.

### *Changes related to the use of the term 'forester' and 'forestry'*

#### House Bill 2341 - Forester Title; educational requirement

- ◆ Rob explained the reason and what legislative language was submitted to the General Assembly to amend the state code requirements on who can be called a state forester.
  - Current requirement is have a graduate degree from an accredited program by the Society of American Foresters.

- Added allowance to submit transcripts to the Society of American Foresters for them to determine if the requirements were met by the individual.
- The State Forester was excluded from the addition. The State Forester is still required to have graduated from an accredited school.
- The legislation was approved.

#### Forestry Camp name change

- ◆ Forestry Camp name was changed to Camp Woods and Wildlife to assist with bringing the attendance up.
- ◆ The change was to the title only, the camp program did not change.

Board discussed the concerns of the use of the terms 'Forester' and 'Forestry'.

- ◆ Mr. Morgan expressed his concern in regards to ensuring stakeholders are involved in the changes and will the connection to forestry be lost with the camp name change.
- ◆ The essence of forest management is what's important. Finding a term the public can connect with is more important than holding on to the term if that prevents us from getting the public to support management of our forest resources.
- ◆ Opportunity to educate the public on what forestry truly is.
- ◆ Rob shared an article from the Journal of Forestry, January 16<sup>th</sup> issue on a study of how people perceive the word 'forest'.
- ◆ We can change the way public perceives a word, change the word, or as the professionals hold solid to the words (forester, forestry) but when talking to the general public use words that the general public can understand and relate to (woods).
- ◆ In marketing use words that better resonate with the public like; woodlot, woodland, woods, stewardship.
- ◆ You can't have a discussion unless you have people. You have to have a marketing to get them in the room, once they're in the room you can have the discussion. Names of the programs have evolved to get people inside the room.
- ◆ Camp Woods and Wildlife is held in direct conflict with Future Farmers of America (FFA) Camp. This will be resolved for next year.
- ◆ Need to get school counselors and parents of kids who are interested in Natural Resources. FFA is no longer a main source of who attends camp.
- ◆ Important to understand how the Forestry title evolved.

## Informational Items:

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### *Seedling Survival Update*

VDOF Deputy State Forester Ed Zimmer briefed the Board on the low seedling survival rate this year.

- ◆ Germination was low due to the amount of rain.
- ◆ There are 500,000 unsold seedlings.
- ◆ There was an excessive amount of mortality from last year's planting due to the extreme change in weather.

Board discussed the effects of too much rain to the seedling trees and the progress of the containerized longleaf.

## Action Items:

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### *Review of Policy and Procedure 01-003 Conduct of Board of Forestry Meetings*

- ◆ Rob discussed the substantial changes of the Memo of Procedures to Policy and Procedure 01-003 Conduct of Board of Forestry Meetings.

- How many meetings we have and when we have them.
- Clarified use of electronic meetings. Only included the ability for individuals to attend electronically for cause. A medical issue or emergency that would prevent from physically attending the meeting.
- ◆ The Board discussed adding the description of 'four at large members' to the Establishment, Composition and General Conditions section. Final decision was to leave as it's written per Code of Virginia §10.1-1102
- ◆ How many meetings to have and when was discussed.
  - Meet in March to discuss RT and elect Chairman and Vice-Chairman.
  - Meet in spring or summer in conjunction with partner events.
  - Meet in fall to discuss legislation and budget.
- ◆ Research commonwealth requirements for quorum and insert into procedures.
- ◆ First meeting in March, Spring/Summer meeting and Fall meeting.

Paused meeting date discussion to address next action item. Rob will work on wording for the proposed meeting dates.

### *Election of Chairman and Vice-Chairman*

- ◆ The nomination committee comprised of Dr. Dave Smith and Greg Scheerer slated John Burke, III for Chairperson and Ken Morgan for Vice-Chairman.
- ◆ A motion was made to approve the slate as presented; seconded. All present were in favor.

Revisited the Policy and Procedures to discuss proposed wording for meeting dates.

- ◆ The meetings and dates will be determined by the Board as far in advance as practical for the benefit of the members and the Commonwealth's notification process. Proposed timeframe of meetings for each year will be:
  - First meeting of the year in March at VDOF Headquarters Office to recommend Reforestation of Timberland rates and elect officers.
  - Fall discussion meeting to focus on a selected topic(s), which may be held at a location related to the topic being discussed.
  - And at least one of the following meetings, preferably in conjunction with an association annual meeting or Expo Richmond:
    - Spring meeting in May or June.
    - Summer meeting in August or September
  - Additional meeting, if desired:
    - Winter legislation meeting held in December or January to discuss proposed legislation or budget items, which may be held in conjunction with Agribusiness Council banquet.
- ◆ Motion was made to accept 01-03 Policy and Procedures Conduct of Board of Forestry Meeting with changes indicated to dates; seconded. All present were in favor.
- ◆ Motion was made to accept 01-03 Policy and Procedures Conduct of Board of Forestry Meeting as amended with understanding that a quorum will be added as appropriate; seconded. All present were in favor.

## **Committee/Liaison Reports:**

### *Reforestation of Timberlands (RT) Committee*

Greg Scheerer shared with the Board the discussion at the RT committee meeting.

- ◆ RT committee had good discussion on rates and committee recommended no changes to rates were needed this year.

- ◆ Don Bright, requested information on what part of Hardwood is being harvested in the regions be a part of the RT report going forward. Don also suggested to look at the Virginia Code §10.1-1126.1 Silviculture practices to be understand the Best Management Practices (BMPs) better.

### **Hardwood Management Task Force**

- ◆ John Burke reviewed with the Board the progress the Hardwood Management Task Force is making. Making great progress and moving forward. A meeting is scheduled on April 3, with many key representatives to discuss improving hardwood management for long term sustainability and health. Goal for this meeting is to have strategies identified and volunteers to work on this going forward.

### **Unfinished Business:**

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None

### **New Business:**

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- ◆ Chairman Worrell would like to see one of the future board meetings focus about solar and some facts on them.
- ◆ Susan Seward, Virginia Products Association, offered to get information from VaCO on what's in the law currently along with the amount of acreage that is currently has applications for solar farms.
- ◆ Board suggested to use the next few meetings to discuss and learn facts about solar. Would like to visit a solar development if possible.
- ◆ Kurt Christiansen, landowner, expressed his thoughts in regards to getting any research answer you want because of the money involved.
- ◆ Susan Seward, Virginia Products Association, talked about the applications that are in process at Sussex County, along with letter of interest for a 13,000 acre project and how the Board of Supervisors are handling it.
- ◆ Meet in May to discuss what the Boards role for solar development is.
- ◆ Don Bright inquired about tracking hardwood land that is being converted to pine plantations.
- ◆ Greg Scheerer mentioned that VDOT is changing where you are allowed to post your entrance permits for logging projects. They need to be posted at front of property. Concerned about them being stolen. VDOT doesn't seem to have consistency from one county to the next.

### **Schedule of Next Meeting:**

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VDOF Executive Assistant Mary Weaver will send out a doodle poll to schedule the next meeting for a day in either the week of May 13<sup>th</sup> or May 27<sup>th</sup>. Location will be either Richmond or Charlottesville.

### **Adjournment:**

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Chairman Worrell called for a motion to adjourn; motion was made to adjourn the March 19, 2019 meeting at 1:58 p.m. and seconded. All present were in favor.

Minutes recorded by Mary Weaver, Executive Assistant

# FY 2019 RT PROGRAM Interim Budget Report

(as of 3/1/2019)

## REVENUE

	PROJECTED	ACTUAL	VARIANCE
Estimated Forest Product Tax, Equip. Rental & Incentive Repayment	\$ 2,037,005.00	\$ 1,200,255.03	\$ (836,749.97)
General Fund Match	\$ 1,945,226.00	\$ 1,945,226.00	\$ -
FY 2018 Cash Carryover *	\$ 362,808.00	\$ 362,808.00	\$ -
<b>Total Revenue</b>	<b>\$ 4,345,039.00</b>	<b>\$ 3,508,289.03</b>	<b>\$ (836,749.97)</b>

## EXPENSES

	BUDGETED	SPENT	BALANCE
Computer Software Costs	\$ 56,053.00	\$ 56,053.00	\$ -
VITA IT Infrastructure Service for Fiscal software	\$ 38,408.00	\$ 22,338.00	\$ 16,070.00
Transfer (one year's fees to Tax Department)	\$ 15,688.00	\$ -	\$ 15,688.00
Support of the Tree Improvement Program	\$ 250,000.00	\$ 250,000.00	\$ -
Program Costs (salaries, services, materials)	\$ 958,501.00	\$ 558,989.44	\$ 399,511.56
Incentives to Landowners	\$ 2,548,909.00	\$ 288,073.00	\$ 2,260,836.00
Projected FPT for incentives**	\$ 477,480.00		
<b>Total Expenses</b>	<b>\$ 4,345,039.00</b>	<b>\$ 1,175,453.44</b>	<b>\$ 3,169,585.56</b>
Balance	\$ -	\$ 2,332,835.59	

\* Cash carryover from FY2018 is due primarily to the FPT collected above the projected revenue.

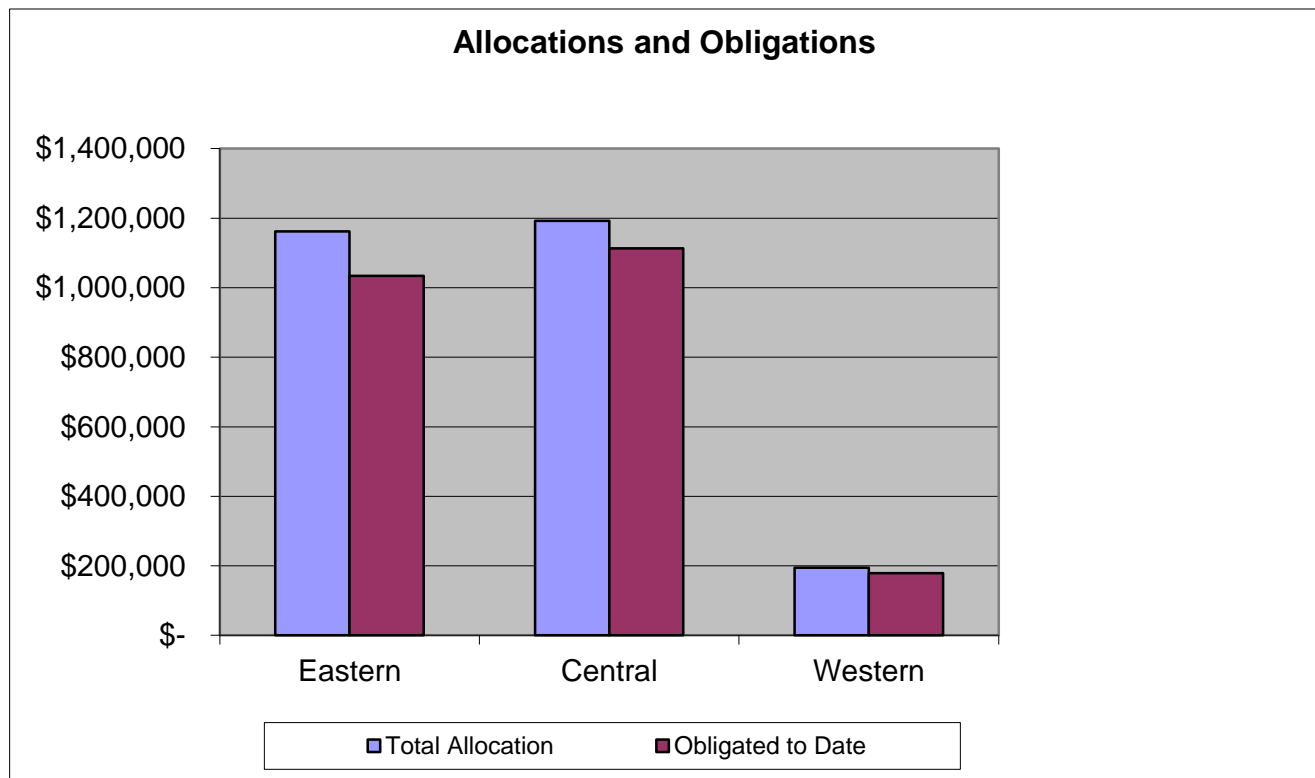
\*\* Additional budget authority advanced to the RT Program budget to allow immediate utilization of any previous fiscal year cash carryover funds.

# FY 2019 RT PROGRAM

## Interim Regional Allocations

(as of 3/4/2019)

Region	1st Allotment 6/21/2018	2nd Allotment	3rd Allotment	TOTAL Regional Budget	Obligated to Date	Percent Obligated	Remaining Balance
Eastern	\$ 1,162,351.00			\$ 1,162,351.00	\$ 1,034,258.00	89%	\$ 128,093.00
Central	\$ 1,192,158.00			\$ 1,192,158.00	\$ 1,112,920.00	93%	\$ 79,238.00
Western	\$ 194,400.00			\$ 194,400.00	\$ 178,613.00	92%	\$ 15,787.00
	\$ 2,548,909.00	\$ -	\$ -	\$ 2,548,909.00	\$ 2,325,791.00	91%	\$ 223,118.00



# FY 2019 RT PROGRAM

## Interim Project Accomplishments

(as of 3/4/2019)

REGION	Project Acres									# OF PROJ.	TOTAL ACRES	NET ACRES
	1	2	3	4	5	6	7	8	9			
Eastern	13,426	10	59	9,522	574	1,815	7,268	36	938	639	33,648	21,631
Central	15,025	98	276	10,840	710	1,663	3,447	0	1,671	641	33,730	20,284
Western	2,365	548	67	1,440	122	98	91	0	199	182	4,930	2,365
<b>TOTALS</b>	<b>30,816</b>	<b>656</b>	<b>402</b>	<b>21,802</b>	<b>1,406</b>	<b>3,576</b>	<b>10,806</b>	<b>36</b>	<b>2,808</b>	<b>1,462</b>	<b>72,308</b>	<b>44,312</b>

### RT PROJECT DESCRIPTIONS

Project 1 -- Tree Planting - Loblolly pine -- \$22 per acre  
 Project 2 -- Tree Planting - other pines -- \$60 per acre  
 Project 3 -- Site Preparation - Mechanical -- \$60 per acre  
 Project 4 -- Site Preparation - Herbicide - pine and hardwood -- \$50 per acre  
 Project 5 -- Site Preparation - Herbicide - hardwood only -- \$30 per acre  
 Project 6 -- Site Preparation - Prescribed burning -- \$35 per acre  
 Project 7 -- Herbicide Release by Air - All pines except white pine - \$18 per acre  
 Project 8 -- Herbicide Release by Air - white pine -- \$45 per acre  
 Project 9 -- Herbicide Release by Ground - all pines -- \$45 per acre

### APPLICATION WAITING LIST

	Applications	Acres	Funding
E-REG	79	3,531	\$ 127,185.00
C-REG	36	1,575	\$ 77,350.00
W-REG	0	0	\$ -
<b>TOTAL</b>	<b>115</b>	<b>5106</b>	<b>\$ 204,535.00</b>

### HISTORIC FUNDING TRENDS

FISCAL YEAR	Special Funds (Forest Prod. Tax)	General Fund	% Match	Total Funding	RT Incentive Funding	# of Projects	Net Total Acres
2012	\$ 1,400,268	\$ 447,570	32%	\$ 1,847,838	\$ 1,157,178	966	37,908
2013	\$ 1,609,654	\$ 697,570	43%	\$ 2,307,224	\$ 1,214,000	1,011	39,508
2014	\$ 1,676,937	\$ 947,570	57%	\$ 2,624,507	\$ 1,796,704	1,284	49,869
2015*	\$ 1,833,240	\$ 947,570	52%	\$ 2,780,810	\$ 1,999,378	1,172	40,630
2016	\$ 1,918,623	\$ 1,277,281	67%	\$ 3,195,904	\$ 2,161,033	994	41,474
2017	\$ 1,945,226	\$ 1,833,239	94%	\$ 3,778,465	\$ 2,788,851	1,178	49,888
2018	\$ 2,019,040	\$ 1,833,239	91%	\$ 3,852,279	\$ 2,462,382	973	43,115
2019	\$ 2,037,005	\$ 1,945,226	95%	\$ 3,982,231	\$ 2,548,909	1,462	44,312

\* In 2015 the project numbers were updated to a single project per number rather than combined projects.



## **REFORESTATION OF TIMBERLANDS (RT) PROGRAM PROPOSED PROJECT RATES FOR THE 2020 FISCAL YEAR**

<b>FY 2019 RT PROJECT DESCRIPTIONS AND RATES</b>	
Project 1 --	Tree Planting - Loblolly pine -- \$22 per acre
Project 2 --	Tree Planting - other pines -- \$60 per acre
Project 3 --	Site Preparation - Mechanical -- \$60 per acre
Project 4 --	Site Preparation - Herbicide (Pine & Hardwood) - \$50 per acre
Project 5 --	Site Preparation – Herbicide (Hardwood Only) - \$30 per acre
Project 6 --	Site Preparation - Prescribed burning -- \$35 per acre
Project 6 --	Herbicide Release by Air - All pines except white pine - \$18 per acre
Project 8 --	Herbicide Release by Air - white pine -- \$45 per acre
Project 9 --	Herbicide Release by Ground - all pines -- \$45 per acre

**NO CHANGE**

<b>FY 2020 PROPOSED RT PROJECT DESCRIPTIONS AND RATES</b>	
Project 1 --	Tree Planting - Loblolly pine -- \$22 per acre
Project 2 --	Tree Planting - other pines -- \$60 per acre
Project 3 --	Site Preparation - Mechanical -- \$60 per acre
Project 4 --	Site Preparation – Herbicide (Pine & Hardwood) - \$50 per acre
Project 5 --	Site Preparation – Herbicide (Hardwood Only) - \$30 per acre
Project 6 --	Site Preparation - Prescribed burning -- \$35 per acre
Project 7 --	Herbicide Release by Air - All pines except white pine - \$18 per acre
Project 8 --	Herbicide Release by Air - white pine -- \$45 per acre
Project 9 --	Herbicide Release by Ground - all pines -- \$45 per acre

### Justification:

- Some rates have been lowered consistently over the last several years, so we are using this year to “rest” the rates to determine what the demand will respond.



## Glyphosate: Health Controversy, Benefits and Continuing Debate

*Author: Ralph Morini, Piedmont Extension Master Gardener*

*Specialist Reviewer: Jeffrey Derr, Professor of Weed Science, Virginia Tech, Hampton Roads AREC*

*Specialist reviewer: Penelope Fenner-Crisp, PhD, Retired Sr Science Advisor to the director of EPA  
Office of Pesticide Programs and Piedmont Extension Master Gardener*

### Introduction

At a time when alternative facts and fake news are making detectives out of all of us, we probably shouldn't be surprised that conflicting opinions invade our lives as gardeners as well. Glyphosate, the active ingredient in the world's most widely used weed killers, including Monsanto's Roundup, has long been regarded by government agencies including the US Environmental Protection Agency (EPA), as economical, broadly effective, low-toxicity and environmentally benign. In 2015 however, glyphosate was classified as "probably carcinogenic to humans" by the World Health Organization's International Agency for Research on Cancer (IARC). This classification conflicts with the EPA's stated opinion that glyphosate is "not likely to be carcinogenic to humans". Since the IARC's departure from the prevailing governmental posture on the chemical, there has been a proliferation of conflicting opinions on where the truth lies. Let's try to sort the arguments out in layman's terms.

### How it works

Glyphosate is applied to leaves and stems and translocates throughout the plant, concentrating in meristem tissue. It blocks the shikimic acid pathway,



preventing plants from making certain amino acids required to produce proteins. needed for growth. Exposure leads to stunted growth, loss of green coloration, leaf wrinkling/malformation, tissue death and plant death generally in 7-21 days.

The absence of this pathway in mammals is the basis for low toxicity claims in humans. Humans and other animals must get these amino acids from their diets since they can't produce them.

The National Pesticide Information Center notes that glyphosate doesn't easily pass through skin. If ingested, it passes quickly without change. It may cause eye/skin and nose/throat irritation and can be toxic if ingested intentionally in very large quantities. This is unsurprising and typical of many commonly used items like aspirin and

table salt, for example. It further notes conflicting studies on whether glyphosate exposure increases cancer rates in humans, including a possible association with Non-Hodgkin Lymphoma, and notes that developmental and reproductive issues have been observed in rats at high doses.

Environmentally, Glyphosate binds to soil, minimizing runoff issues. It is broken down by microbial action with a half-life averaging about 47 days.

## History

Glyphosate was patented by Monsanto in 1974 and is the active ingredient in their Roundup herbicide. Today glyphosate is used in many competing herbicide products. Its use as a weed control product took off in the 1990s when Monsanto introduced GMO crops that are resistant to it. Today these crops include corn, soybeans, sugar beets, canola and cotton. Glyphosate is used as a pre-planting treatment and as a maintenance treatment during the growing season. Less well known is its use as a dessicant, sprayed on wheat crops. The practice is to spray Roundup or a similar product on wheat to dry the plants up a couple of weeks prior to harvest. This makes the harvest more uniform and easier on harvesting machinery. There is some dispute about how widespread this practice is in the US. Overall use of glyphosate herbicide products in the US is in excess of 100 million pounds annually.



## The IARC Position

On March 20, 2015, IARC published an opinion that called glyphosate “Probably carcinogenic to humans”. The studies were an analysis of published and peer reviewed reports, of mostly agricultural exposures in the US, Canada and Sweden performed after 2001. It also reanalyzed EPA studies of tumors in lab mice. According

to IARC, the EPA originally classified these results as possibly carcinogenic to humans (1985), but then later reclassified them as presenting “evidence of non-carcinogenicity in humans” (1991) after a review of the tissue slides by an independent panel of expert pathologists. The IARC analysis of this data led to a conclusion of “sufficient evidence of carcinogenicity” that they became a part of the “probably carcinogenic to humans” position noted above.

## The EPA Position

In December 2017, the EPA released a “draft” human health risk assessment for glyphosate, concluding that it is “not likely to be carcinogenic to humans” and found “no other meaningful risks to human health” when used according to published directions. The EPA assessment is based on published information plus manufacturer data that is normally withheld from public view to protect proprietary information. While Monsanto offered to provide this data to IARC, they declined to utilize it. The EPA conclusion agrees with virtually every major regulatory body in the world, (IARC, not a regulatory body, excepted) and includes the latest observations of enrollees in the Agricultural Health Study, a collaboration of EPA, National Cancer Institute, National Institute of Environmental Health Sciences and the National Institute for Occupational Safety and Health. It is the largest ever pesticide study with over 50,000 farmers in North Carolina and Iowa participating over 25+ years. A November 2017 published study update cited “No association apparent between glyphosate and ...Non-Hodgkin Lymphoma. There was some evidence of AML (acute myeloid leukemia) among the highest exposed group that requires confirmation.” The EPA draft assessment does state that “there is potential for effects on birds, mammals, and terrestrial and aquatic plants”. A “final” opinion is due from EPA in 2019.

## Opinions from Other World Regulatory and Advisory Organizations

In March 2015, the European Chemicals Agency (ECHA), the main driver of European Union chemicals regulation, released a report that concluded that there is “no evidence linking glyphosate to cancer in humans, based on the available information” and that “glyphosate should not be classed as a “substance that causes genetic damage or disrupts reproduction”.

The same conclusions were reached by the European Food Safety Authority, national authorities in Canada, Japan, Australia and New Zealand, and the Joint Food and Agriculture Organization/World Health Organization on Pesticide Residues. This makes the IARC the only agency with a divergent view.

## The Conflict Continues

The IARC position has been undermined by a Reuters journalist who managed to get a copy of the draft report and found 10 significant instances where evidence of non-carcinogenicity of glyphosate in animals were edited out and were replaced with neutral or countervailing statements.

On the flip side, there is reporting that a key EPA official involved in the agency's cancer assessment has a cozy and maybe compromised relationship with Monsanto. There is current court action underway involving hundreds of lawsuits of alleged non-Hodgkin lymphoma sufferers brought by farmers and farm workers. There are also published reports by academic researchers noting correlations between glyphosate exposure and shortened gestational lengths in pregnant women as well as the coincident rise of glyphosate use with the increase of autism since the 1990s. There are no direct causal relationships established, but they add to the emotion around the topic.

Complicating matters is the fact that the cited reports address glyphosate without considering the effects of other chemicals in the herbicide formulation, which need not be identified on the product label. For example, there is evidence that the surfactant in Roundup is toxic to aquatic plant species so glyphosate-based products containing that surfactant are not approved for aquatic weed control. In addition, conventional farmers handle many different chemicals throughout their lifetime. It is difficult to effectively isolate glyphosate's impacts from the many other variables that could affect the study participants' health.

And finally, after 20 plus years of heavy use, there are an increasing number of weeds, 24 species at last count, that are glyphosate resistant. At some point this becomes a major issue for both weed control and the crops that the herbicide has been mated with. What then?

## Sorting It Out

An important distinction between IARC and EPA positions is that IARC assesses Hazard. EPA assesses Risk. Hazard means that glyphosate, in this case, is capable of causing cancer under some circumstances. IARC does not determine safe/unsafe exposure levels or attempt to quantify risks. Risk attempts to quantify impact based on level of exposure. The EPA "not likely to be carcinogenic" position is based on use per manufacturer directions.

From a user viewpoint, glyphosate-based herbicides are low toxicity compared to other chemical weed control options. It has had a positive impact in the growth of no-till farming, reducing erosion, runoff and topsoil depletion. It has also helped increase food production in a food short world, while helping control growers' costs.

On the flip side, there are credible individuals and environmental organizations that hold the opinion that glyphosate may be a human carcinogen. Regardless, it is unsettling to know that we unavoidably ingest glyphosate residues in our food and at a minimum, pass it through our bodies. The Non-Hodgkin lymphoma and AML claims by high exposure farm workers are a definite concern, even if their exposure is a lot higher than for us home gardeners.

Then there is the symbiotic relationship between glyphosate, GMO crops and Monsanto's heavy dependence on their related acceptance by society. There is certainly reason for caution in accepting Monsanto's advocacy given their stake in the outcome.

## Organic Alternatives

Based on my research, there doesn't seem to be another chemical herbicide that matches glyphosate's combination of effectiveness and low toxicity. So, as chemical weed killers go, it is hard to improve on.



There are several organic post-emergence herbicides available for home use. They include acetic acid-based products containing 10-20% acidity vs the 5-7% content of the white vinegar in our kitchens. Other products contain mixtures of plant oils, acetic or other acids, or other chemicals. The products most widely used by organically minded professionals are plant oil mixtures. Clove oil is the basis for many with citric and cinnamon oils also part of different recipes. All these options are contact herbicides. They will burn down above ground plant parts but underground parts like rhizomes, bulbs and roots are unaffected and require repeated applications for control. In addition, acetic acid and the oils have strong scents which some may find objectionable. Ironically, the risk to skin and eyes from contact may be higher with these products than with glyphosate. Many advisors recommend these alternatives for smaller weed control requirements, for example on a patio or pool area.



*Corn gluten can be a practical preemergence weed control product*

If your need is for preemergence weed control, corn gluten meal may be used on turf and certain other areas. It is a byproduct of corn milling and inhibits germination of crabgrass and certain other weeds. It requires metered application and moisture management, and lasts about 5 or 6 weeks. However, tests indicate that chemical herbicides like pendimethalin are more effective than corn gluten.

## Cultural Alternatives

Beyond hand weeding and boiling water, there are a couple of non-herbicidal practices worth mentioning. Using a propane torch to burn weeds, actually to heat them to kill cell function, can be an effective contact weed control method. Obviously, care to prevent the spread of fire beyond the weeds under attack is very important. Specialty weed torches have flames that are nearly invisible and it is not hard to imagine inadvertently lighting

up a wooden fence post, or dead plant material among the weeds. Again, the method does not kill the roots of offending plants, only the above ground portion.

For a contained area, solarization is an option. This involves tilling the area to be cleared of weeds and covering it with a sheet of plastic for six weeks in summer. This will raise the soil temperature enough to kill weed seed.

## *So What About Roundup™?*

The IARC opinion lacks the specificity to be of much value, beyond stoking fear. The EPA draft is more substantial and the “not likely to be carcinogenic” characterization is a relatively high bar. However it isn’t conclusive and the many outstanding claims of negative health impacts will keep the debate going.

The occasional, proper use of glyphosate products by home gardeners doesn’t generate unacceptable risks of toxicity, carcinogenicity or environmental harm, as long as users follow directions for mixing and use. The large scale use of these chemicals in commercial farming does however cause concern for farm workers, the environment and the public at large. Gut level discomfort with the widespread use of glyphosate products on commercial crops and its hidden presence in our food, is understandable in spite of the official view that it is not likely to harm human health. It is this large scale commercial dependence on glyphosate, and other chemical pesticides and fertilizers that is most troubling.

What does the home gardener do? Aspire to gardening using integrated pest management or organic techniques. Turn to glyphosate and other chemicals, minimally, when there is no effective alternative. Follow directions for mixing and use. Understand that virtually all conventionally grown produce and processed foods may contain trace levels of pesticides such as glyphosate and that the EPA



*Always read the label!  
The label is the law.*

has determined that these amounts don’t pose a health risk. And while conventionally grown produce is equally nutritious, organic produce will be closer to chemical free.

And stay tuned. This story is a long way from over...

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