



July 20, 2022

Volume 12 Issue 2

Early Growing-season Prescribed Fires Shown to Burn More Completely and at Greater Intensity than Dormant-season Burns

Nearly all prescribed fires in the Appalachians are conducted in the dormant-season, either before green-up in late-winter/early spring (February to early April), or after leaf fall in late October and November. Expanding the burn window into the early growing-season, between bud-break and full leaf-out in mid/late April, could result in getting more fire on the ground to restore fire-adapted forests and woodlands. However, because late spring burns are uncommon, relatively little is known about the fire behavior and effects of these burns compared to dormant-season burns. CAFMS' members identified fire season effects as an important knowledge gap, which led the [Joint Fire Science Program](#) (JFSP) to request research proposals that would address this topic for the Appalachian region. [Donald Hagan](#), Associate Professor of Forest Ecology at Clemson University, was awarded funding for the project "*Community and Ecosystem-level Effects of Growing v. Dormant Season Burning in the Southern Appalachians*".



Post Burn fuels monitoring

A paper from the project titled [How do fire behavior and fuel consumption vary between dormant and early growing season burns in the southern Appalachians?](#) was recently published in the journal *Fire Ecology*, which is supported by [The Association for Fire Ecology](#); it was authored by Matthew Vaughan, Donald Hagan, William Bridges, Matthew Dickinson, and Adam Coates. The team investigated fire season and topographic effects on fuel moisture, percentage of landscape burned, fire intensity, and fuel consumption.

Study Sites and Methods

- Burn units were located in oak forests in Chattahoochee National Forest (Chattooga River RD) in Georgia and Sumpter National Forest (Andrew Pickens RD) in South Carolina. Burn units averaged 700 acres.
- Fuel loading and moisture were measured across the units before the burns.
- Prescribed fires with were conducted in 2018 and 2019; dormant-season (DS) burns were from late-January to early April, and growing season (GS) burns were April 18 to 24. Both hand- and aerial ignition were employed. Weather data that included solar radiation, temperature, humidity, wind speed, and fuel moisture were collected on burn days.
- During the burns, thermocouple probes recorded surface temperatures across the units and the authors calculated an index of heating that described the amount and duration of heat on the thermocouples (time and amount of temperature above 60 °C / 140 °F).
- After the burns, fuel loading was measured again to determine consumption, as was bole char height.

Key Findings

- Wind speeds, RH, and KBDI were similar for DS and GS burns. However, there was greater solar radiation, warmer temperatures, and lower fuel moisture levels during the GS burns, which led to more complete burns (% burned).
- The index of heating, measured by thermocouples, was more than 5X greater in the GS burns, which was driven by greater fire intensity mid-afternoon (2 to 4pm)
- Litter consumption was similar, but duff consumption was greater in GS burns as virtually no duff was consumed in DS burns.
- Topographic effects on bole char height were variable. The more intense GS burns generally had greater average bole char than DS burns.



Take home points

- In the early growing season but before full canopy leaf out, greater solar radiation and drier fuels resulted in more complete and intense burns, particularly during the mid-late afternoon.
- Surprisingly, fuel consumption was pretty similar in DS and GS burns but there more points that did not burn (zero consumption) in the DS burns. For points that did burn, fuel consumption was similar though duff consumption only occurred in the GS burns.
- This study shows that early growing season burns can be used effectively and in fact may have more desirable ecological effects by burning at greater intensity, in addition to reducing the sprouting ability of fire-sensitive species, which other studies have documented.

This study was a component Matthew Vaughan's Master's Thesis at Clemson. Another paper from Matthew's Thesis focused on initial vegetation responses to the DS and GS burns, [Effects of burn season on fire-excluded plant communities in the southern Appalachian Mountains, USA](#). Allison Melcher, a Clemson graduate student, also worked on this study and was advised by Don Hagan. Allison defended her MS Thesis in May, and it will be available online in Fall 2022. Her research focused on burn season effects on birds and forest structure/habitat.

Southern Blue Ridge Fire Learning Network / CAFMS Workshop Recordings



Did you miss the joint FLN and CAFMS workshop this past May? Or maybe you just want to re-watch your favorite presentation. You can now find the presentations on our YouTube channel.

<https://www.youtube.com/playlist?list=PLe896VVsDfQIxHT1IFKYbLuBg5IC2Zx8r>

Fueling Collaboration.... Seasons 1&2

If you missed Fueling Collaboration or just want to re-watch a previous episode you can check them out here:
www.fuelingcollab.com

These are interactive panel discussions designed to encourage collaboration between fire managers and scientists. The series is built on questions from the registered attendees.



Save the Date!

The 5th National Cohesive Wildland Fire Management Strategy Workshop will be in Asheville, NC this year!

November 14-18, 2022

Registration will open soon.



Coming Soon

New CAFMS Website

CAFMS has an all-new website that will make its debut next month! New interactive content and a fresh look! We will let you know when it's ready!

Communicate with Us!



Find us on twitter @APfirescience or find us on Facebook by searching Consortium of Appalachian Fire Managers and Scientists.

Join CAFMS:

The consortium is for all land managers and researchers in the region who deal with any aspect of fire. To join, simply provide us with some contact information at the web site listed below.

www.apalachianfire.org

Helen Mohr helen@cafms.org

Jen Bunty jen@cafms.org

