REQUEST FOR PROPOSAL # R24-004

TURF MANAGEMENT SERVICES

FEBURARY 20, 2024

Note: This public body does not discriminate against faith-based organizations in accordance with the *Code of Virginia* §2.2-4343.1 or against an Offeror because of race, religion, color, sex, national origin, age, disability, or any other basis prohibited by state law relating to discrimination in employment.

REQUEST FOR PROPOSAL (RFP)
RFP # R24-004

GENERAL INFORMATION FORM

QUESTIONS/INQUIRIES: All questions/inquiries for information regarding this solicitation should be directed to:

Name: Sheryl Sullivan, CUPO
Phone: (540) 8316106
Email: sssullivan@radford.edu

Written questions to be submitted via email no later than: March 27, 2024 by 3:00 PM Eastern Time

DUE DATE: Proposals will be received until April 18, 2024 up to and including 3:00 PM Eastern Time

LATE PROPOSALS: To be considered for selection, proposals must be received by Radford University's Procurement and Contracts Department by the due date and time identified in this solicitation document. The official time used in documenting the receipt of proposals is that time identified on the automatic time stamp machine located in the Procurement and Contracts Department in the David E. Armstrong building on the main campus of Radford University. Proposals received in the Procurement and Contacts Department after the date and time designated are automatically deemed non-responsive and will **not** be given consideration. The University is **not** responsible for delays in delivery conducted by the U.S. Postal Service, private couriers, or the intra university mail system. **It is the sole responsibility of the Offeror to ensure their proposal reaches the Procurement and Contracts Department at Radford University by the designated date and time.**

ADDRESS: Proposals should be mailed or hand delivered to:

Radford University, Procurement and Contracts Department
P. O. Box 6885 (if via mail)
David E. Armstrong Complex, 501 Stockton St. (if via courier)
Radford, VA 24142-6885.

Identify the envelope package as instructed in **Attachment A** – Terms and Conditions.

PRE-PROPOSAL CONFERENCE: A pre-proposal conference will be held on March 14, 2024 at 3:00 PM. See Section (13) for additional information.

UNIVERSITY CLOSINGS: If the University is closed as a result of an act of God or an emergency situation, the University's website shall post notices of said closings. It is the responsibility of the vendor to check the website at www.radford.edu for said notifications. If the University is closed on the day proposals are due, proposals will be accepted same time the next scheduled business day the University is open. If the University is closed on the day of a scheduled pre-proposal conference a written addendum will be issued to officially reschedule the conference.

TYPE OF BUSINESS: **(Please check all applicable classifications).** In order to qualify for assigned Small, Women and Minority (SWaM) points your business must be certified by the Virginia Department of Small Business and Supplier Diversity (SBSD), provide your assigned SBSD certification number. For assistance with SWaM certification, visit the SBSD website at https://www.sbsd.virginia.gov/.

____ **Large**

____ **Small business** – A business that is at least 51% independently owned and controlled by one or more individuals who are U.S. citizens or legal resident aliens, and together with affiliates, has 250 or fewer employees, or average annual gross receipts of $10 million or less averaged over the previous three years. One or more of these individual owners shall control both the management and daily business operations of the small business.

____ **Women-owned business** – A business that is at least 51% owned by one or more women who are U.S. citizens or legal resident aliens, or in the case of a corporation, partnership, or limited liability company or other entity, at least 51% of the equity ownership interest in owned by one or more women who are citizens of the United States or legal resident aliens, and both the management and daily business operations are controlled by one or more women.

____ **Minority-owned business** – A business that is at least 51% owned by one or more minority individuals who are U.S. citizens or legal resident aliens, or in the case of a corporation, partnership, or limited liability company or other entity, at least 51% of the equity ownership interest in the corporation, partnership, or limited liability company or other entity is owned by one or more minority individuals who are U.S. citizens or legal resident aliens, and both the management and daily business operations are controlled by one or more minority individuals, or any historically black college or university, regardless of the percentage ownership by minority individuals or, in the case of a corporation, partnership, or limited liability company or other entity, the equity ownership interest in the corporation, partnership, or limited liability company or other entity.

COMPANY INFORMATION/SIGNATURE: In compliance with this Request for Proposal and to all the conditions imposed therein and hereby incorporated by reference, the undersigned offers and agrees to furnish the goods or services in accordance with the attached signed proposal inclusive of all addenda, if applicable, and as mutually agreed upon by subsequent negotiation.

<table>
<tr><td colspan="2">FULL LEGAL NAME (PRINT)
(Company name as it appears with your Federal Taxpayer Number)</td><td colspan="2">FEDERAL TAXPAYER NUMBER (ID#)</td></tr>
<tr><td colspan="2">BUSINESS NAME /DBA NAME/TA NAME
(If different than the Full Legal Name)</td><td colspan="2">BILLING NAME
(Company name as it appears on your invoice)</td></tr>
<tr><td colspan="2">PURCHASE ORDER ADDRESS</td><td colspan="2">PAYMENT ADDRESS</td></tr>
<tr><td colspan="2">CONTACT NAME/TITLE (PRINT)</td><td colspan="2">EMAIL ADDRESS</td></tr>
<tr><td>TELEPHONE NUMBER</td><td>TOLL FREE TELEPHONE NUMBER</td><td>FAX NUMBER</td><td>EVA VENDOR ID NUMBER

VIRGINIA STATE CORPORATION COMMISSION REGISTRATION NUMBER</td></tr>
</table>

I acknowledge that I have received the following addenda posted for this solicitation.

1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ (Please check all that apply.)

SIGNATURE: _____ **DATE:** _____

1. **PURPOSE:**

The intent and purpose of this Request for Proposal (RFP) is to establish a contract through competitive negotiations for Turf Management Services for Radford University located at 801 East Main Street, Radford, Virginia 24142, an agency of the Commonwealth of Virginia.

2. **SMALL, WOMEN-OWNED AND MINORITY OWNED - SWaM BUSINESS PARTICIPATION:**

The mission of Radford University is to ensure strategic business development practices are in place to promote Small, Women-Owned and Minority-Owned (SWaM) businesses to the maximum extent. Radford University encourages prime suppliers, Contractors, and service providers to facilitate the participation of small businesses, and businesses owned by women and minorities through partnerships, joint ventures, subcontracts, and other inclusive and innovative relationships.

Radford University has established SWaM goals that are posted on the Procurement and Contract website. Links to the University's SWaM initiative can be located at: Procurement and Contracts | Radford University.

3. **CONTRACT PERIOD**:

The term of this contract is for one (1) year, or as negotiated. There will be an option for four (4) additional one-year renewals, or as mutually negotiated.

4. **BACKGROUND**

Radford University Background: Radford University is a comprehensive public university of 7,718 students that has received national recognition for many of its undergraduate and graduate academic programs, as well as its sustainability initiatives. Well known for its strong faculty/student bonds, innovative use of technology in the learning environment and vibrant student life on a beautiful 211-acre American classical campus, Radford University offers students many opportunities to get involved and succeed in and out of the classroom. With over 300 clubs and organizations, Radford University offers many opportunities for student engagement, leadership development and community service. In addition to robust academic offerings and engaging student experiences on the main campus located in Radford, Virginia, Radford University also offers a clinical-based educational experience for some 1,000 students living and learning in Roanoke, Virginia as part of Radford University Carilion, a public-private partnership focused on the cutting-edge delivery of health sciences programming, outreach, and service. Radford University joins several other institutions in offering degree programs and continuing education opportunities at the Roanoke Higher Education Center in Roanoke, the Southwest Virginia Higher Education Center in Abingdon and flexible online offerings through its virtual campus.

Specific Background: Radford University's average spend on turf management services is $25,000.00 annually. The yearly expenditure is dependent upon the needs of Radford University. Blanket purchase orders will be issued annually for this service plus any additional separate purchase orders necessary for additional jobs that may be initiated. However, prior years purchasing patterns are no guarantee of future spending needs.

5. **EVA BUSINESS-TO-GOVERNMENT ELECTRONIC PROCURMENT SYSTEM**: The eVA internet electronic procurement solution streamlines and automates government purchasing activities within the Commonwealth of Virginia. Radford University, and other state agencies and institutions, have been directed by the Governor to maximize the use of this system in the procurement of goods and services. We are therefore requesting that your firm register as a **self-registered** vendor in the eVA system.

There are transaction fees involved with the use of eVA. These fees must be considered within the provision of quotes, bids, and price proposals offered to Radford University. Failure to register within the eVA system may result in the quote, bid or proposal from your firm being rejected and the award made to another vendor who is registered in the eVA system.

Registration in the eVA system is accomplished on-line. Your firm must provide the necessary information. Please visit the eVA website portal at https://eva.virginia.gov/register-now.html and register with eVA. This process needs to be completed before Radford University can issue your firm a Purchase Order or contract. If your firm conducts business from multiple geographic locations, please register these locations in your initial registration.

For registration and technical assistance, reference the eVA website at http://www.eva.virginia.gov, or call eVA Customer Care at 866-289-7367 or 804-371-2525. Email eVACustomerCare@DGS.Virginia.gov

6. **CONTRACT PARTICIPATION-COOPERATIVE PURCHASING/USE OF AGREEMENT BY THIRD PARTIES**
Under the authority of §6 *of the Rules Governing Procurement of Goods, Services, Insurance and Construction by a Public Institution of Higher Education of the Commonwealth of Virginia (see* https://vascupp.org/rules.pdf), it is the intent of this solicitation and resulting contracts to allow for cooperative procurement. Accordingly, any public body, public or private health or educational institutions or lead issuing institution's affiliated corporations may access any resulting contract if authorized by the Contractor.

Participation in this cooperative procurement is strictly voluntary. If authorized by the Contractor, the resultant contract may be extended to the entities indicated above to purchase at contract prices in accordance with the contract terms. The Contractor shall notify Radford University in writing of any such entities accessing the contract. No modification of this contract or execution of a separate contract is required to participate; however, the participating entity and the Contractor may modify the terms and conditions of this contract to accommodate specific governing laws, regulations, policies, and business goals required by the participating entity. Any such modification will apply solely between the participating entity and the Contractor. The Contractor will provide semi-annual usage reports for all entities accessing the contract. Participating entities shall place their own orders directly with the Contractor and shall fully and independently administer their use of the contract to include contractual disputes, invoicing and payments without direct administration from Radford University. Radford University shall not be held liable for any costs or damages incurred by any other participating entity as a result of any authorization by the Contractor to extend the contract. It is understood and agreed that Radford University is not responsible for the acts or omissions of any entity and will not be considered in default of the contract no matter the circumstances.

Refer to **Attachment C,** Zone Map, if the Offeror wishes to submit a separate pricing structure based on approved zones for cooperative institutions. If no other prices are offered, pricing provided will apply to all zones in the Commonwealth of Virginia. If you wish to provide pricing for a zone other than which this solicitation originated, please indicate you are doing so in the response. If you anticipate pricing differentials for different zones, a separate pricing sheet must be submitted for each zone that includes appropriate pricing for that zone.

Use of this contract does not preclude any participating entity from using other contracts or competitive processes as the need may be.

7. **CONTRACT ADMINISTRATION:** Radford University assigns Contract Administrators to each contract awarded. The Contract Administrator shall be the initial point of contact for the Contractor. Contract Administrators are charged with ensuring the terms and conditions of the contract are followed, payments are made in accordance to the contractual pricing schedule, and reporting noncompliance issues to the Procurement and Contracts Department at Radford University. Contract Administrators **do not** have the authority to authorize changes and/or modifications to the contract. Should noncompliance issues exist and cannot be resolved at this level or changes/modifications to the contract are required, the assigned Contract Officer in the Procurement and Contracts Department must be notified immediately by the Contract Administrator. The assigned Contract Administrator is Radford University's Facilities Management Landscape Superintendent.

8. **DEFINITIONS: INTENTIONALLY LEFT BLANK**

9. **STATEMENT OF NEEDS**: The contractor shall furnish all labor, tools, materials, equipment, staff and supervision to provide Turf Management Services to Radford University as stated herein.

A. Compliance: All materials and application work shall be in strict compliance with all currently applicable codes, standards and specifications and any future codes, standards and specifications which may become applicable during the term of this contract. Prior to any work being performed the vendor shall submit a treatment plan, listing all products to be used and application methods, to the Contract Administrator and/or the Grounds Superintendent for final approval.

B. Requirements: Contractor must be engaged in lawn/turf maintenance type of work on regular basis. Contractor must have all necessary equipment and contractor's employees must be fully trained on the use of equipment and the proper application of any and all chemicals applied at the University. The contractor should, in their proposal, describe the application equipment and methods that will be used to provide services.

1. Chemical Application – Main Campus North and South, Dedmon Athletic Complex East and West, rates and materials as shown. (Program will include athletic fields as needed). See Attachment F for campus map.

2. Chemical Application – In addition to the properties shown on the campus map there are three other properties which must be included in your proposal. These properties below shall follow the Nutrient Application Work Sheet for the Main Campus, see attachment G.

   a) Printing Services/Surplus Property Storage (located at 219 E. Main St) and adjacent Intramural Complex, total square footage is 134,300.
   b) 915 Tyler, Radford, VA, this is a residential property. This property has 45,494 sq. ft.

C. <u>Service Expectations</u>

1. The Contractor must provide service in accordance to the specifications provided in the university's Nutrient Management Plan approved by the DEQ. All fertilizer must be approved by Radford University. The contractor will provide the turf maintenance, which supports the university's Nutrient Management Plan:

   a) **Application Timing.** Fertilizer applications are to be made per the Nutrient Management Plan. Typically, the first application is performed during Spring Break. Second to be performed after Spring Commencement (Graduation). Third to be performed prior to fall Move In. The final application to be made during Thanksgiving Break. Contractor will be responsible for coordinating applications times with Radford University.

   b) **Means of Application.** Fertilizer applications should be in a dry form. Products should be dispensed from an approved commercial spreader capable of even product distribution. If equipment results in uneven application, another method of application will need to be developed with the Contract Administrator. All fertilizers used should be manufactured by a professional fertilizer manufacturer and shall be accompanied by a certification of analysis and MSDS sheet. Contractor should have the capability to make a complete application to all areas in a three-day time period.

   c) **Weed Control (Pre-Emergent) - Cool Season Turf.** Pre-emergence weed control should be applied at the optimal time period in the spring (Typically during the spring break period in March). Approved materials to be used for this treatment are Barricade, Dimension, or approved equivalent with the Contract Administrator making final determination of suitability.

   d) **Weed Control (Post-Emergent) - Cool Season Turf. Selective** Post Emergence weed control should be performed once in May after graduation and once in November during Thanksgiving Break. Additional spot applications of post emergence weed control may be necessary to keep the turf weed free. Weed control should not be applied during afternoon hours when temperatures exceed 80 degrees F. Approved materials to be used for this treatment are Trimec, Triamine II, and/or approved equivalent. All products shall be applied in accordance with manufacturers' instructions.

D. **<u>Individual Item Service Requirements</u>:** For all of the services listed below, the University shall supply the appropriate chemical or fertilizer product. Applications will be at the University's request and approval.

1. **Weed Control (Crack and Crevice).** Should be spot sprayed in sidewalks, mulch beds, parking lots, and turf areas. This item shall be priced separately and expressed in terms of an hourly rate.

2. **Lime or Gypsum.** Lime or Gypsum should be applied at a rate of 30-50 lbs. per 1000 sq. ft., one (1) time per year, usually during the summer so as to insure maximum root intake of fall fertilization. Lime and/or gypsum may be pelletized or pulverized and should be applied in one (1) single application. Soil samples shall be taken once per year prior to application of lime to determine need and actual required application rate.

3. **Granular Insect Control.** Insect control should be for the control of sod webworms, white grubs, and/or other turf damaging insects. Spot applications of approved granular organophosphate compounds may be used if necessary. Contractor shall inspect turf prior to each fertilization to determine the need for insect control.

4. **Granular Disease Control.** Contractor shall inspect the turf prior to each fertilization to determine the need for fungal control. In the event that a turf-damaging disease is detected and is affecting the grounds, it may be necessary to apply a granular fungicide used at manufacturer's suggested timing and rates.

5. **Tank Spray.** Contractor shall provide price per 1000 sq. ft. to mix and apply liquid chemical to turf areas using tank mounted equipment.

6. **Granular Fertilization Unit Price.** Contractor shall provide price per 1000 sq. ft. to apply granular fertilizer to turf areas using approved commercial spreader capable of even product distribution. Refer to the Nutrient Management Plan for application rates.

E. **Records of Applications:** Contractor should supply the University Facilities Management Landscape Superintendent with copies of all application records at the time of treatment. Records shall include but are not limited to:

1. Date and time of application
2. Area treated
3. Type of treatment and host
4. Product name and used rate of application
5. Total acreage treated and total amount of materials used.
6. Applicator(s) name(s) and certification number(s)
7. MSDS sheets on all product(s) used during applications(s)
8. All other pertinent information that may apply.
9. **All spills should immediately be reported to the Contract Administrator, or call 540-831-7800 (Work Control) or 540-831-5500 (RUPD Dispatch).**

F. **Response Time**: The Contractor shall be required to perform requested services within ten (10) calendar days of notification by the University.

G. **Contractor Qualifications**:

1. The contractor should be qualified for the performance of this type of work in accordance with licensing by the State Board of Contractors and demonstrate the ability to provide the services specified herein. All personnel used by the Contractor for the performance of this work should be qualified for their classification. The University reserves the right to refuse to accept services from any personnel deemed by the University to be unqualified or unable to perform assigned work. The Contractor should maintain a steady work crew consisting of qualified staff that fully understands the requirements of the job. The Contractor shall provide evidence of qualifications for any personnel performing work under this contract if requested by the University.

2. Any employees of the contractor who will be applying chemicals must have a valid VDACS Pesticide Applicators License. Valid VDACS Pesticide Applicators Licenses shall be submitted with the proposal and must be submitted prior to contract award. The University may request copies of licensing at any time during the life of the contract and the contractor must provide upon request.

H. **Tools and Equipment:** Crews and other personnel under this contract should provide ALL their own tools needed for proper execution of the work described herein. Each crew shall have the resources to transport materials to the job site, without the assistance of the University. Each worker supplied by the Contractor shall have appropriate Personal Protective Equipment. The use of the necessary tools, equipment, and vehicles should be considered in the hourly rate.

I. **Work Coordination**: All work performed under this contract by the contractor should be coordinated through the Landscape Superintendent or Grounds Supervisor. These individuals shall be responsible for all material procurement, work site access, and inspections for Facilities Management/Radford University.

J. **Scheduling of Work**: Once work is started, contractor must maintain a work force to complete the project without interruption. The contractor should be required to start a project or work assignment with 1 week of notification unless a longer lead time is requested by Radford University. When a deadline is established for a particular project the Contractor shall provide the University with a schedule and crew configuration illustrating how the project will be completed.

K. **Normal Working Hours**: Work performed under this contract will be performed during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except holidays (except for emergency situations) and unless otherwise required by the, Contract Administrator, Radford University, and/or designee. There may be occasions when the crew(s) must work after 5:00 p.m. and on Saturday and Sunday or Holidays to complete a project by a deadline date. The Contractor shall work on these occasions on a one (1) week notice.

L. **Estimates for Work**: Upon request by the University and only for projects with adequate plans and specifications, the Contractor should:

1. Prepare and submit a written estimate for the labor and materials, which will be required to perform the work as specified.
2. Receive the University's written authorization before proceeding with work.
3. Upon receipt of authorization, actual work shall not exceed the contractor's estimate for labor and materials.

M. **Uniforms:** All employees of the contractor and subcontractor shall wear uniforms or other appropriate approved attire at all times to designate their affiliation with the Contractor

N. **Safety Precautions**: The Contractor shall comply with the rules and regulations of OSHA and the Department of Labor. The Contractor alone shall be responsible for the safety, efficiency and adequacy of their plan, appliances, and methods, and for any damage which may result from their improper performance, maintenance or operation. The Contractor is responsible for blowing off hard surfaces (sidewalks and parking lots). The Contractor shall erect and properly maintain at all times, as required by the conditions and progress of the work, proper safeguards for the protection of workers and the public and shall post danger warnings against any hazards created by the construction operations.

10. **SPECIFIC REQUIREMENTS**: Proposals should be as thorough and detailed as possible so that Radford University may properly evaluate your capabilities to provide the required goods or services. Offerors are required to submit the following information/items as a complete proposal:

A. **Complete and Sign**: The return of the completed RFP inside cover sheet, with addenda acknowledged, if any. This document should be filled out and signed at the bottom (see Page 3).

B. **Experience and Qualifications**: Please provide the following deliverables within the body of your proposal:
1) Experience of the firm in providing services described herein.
2) Names, qualifications and experience of personnel to be assigned to the project, including an organization chart, individual qualifications and duties, etc.
3) Resumes of key employees to be assigned to the project

C. **Financial Proposal**:
1) Describe the fees that will be charged for the goods and services proposed in this RFP. Ensure that fees are provided for all Goods and Services.
2) Describe how the University will benefit from cost savings by accepting the firm's proposal.
3) Discounts may be provided as category discounts, line item discounts, or both.
4) Include any volume discounts, incentives, or rebates in your offering.
5) University Department users may request increased discounts or negotiate further value-added goods and services at any time. Selected Firm(s) may increase the minimum discount percentage at any time, either permanently or on a transaction only basis; any decrease to a minimum discount percentage requires written approval of Radford University.

6) A cost proposal template is being provided with this solicitation (See Attachment E). This must be completed and returned with your proposal. Any additional goods and services that your company may provide can be included as a separate attachment.

* The rates provided must be ***"fully burdened"*** to include any ancillary expenses associated with project performance. Transportation, travel time, soft costs, as well as other expenses, will not be paid for separately. This must be an inclusive rate.

D. **References**: Provide four (4) references, either educational (preferred) or governmental, for whom you have provided the type of services described herein. Include the date(s) services were furnished, the client name, address, and the name and phone number of the individual Radford University has your permission to contact.

E. ***Participation of Small, Women-owned and Minority-owned business (SWaM) Business**: If your business cannot be classified as SWaM, describe your plan for utilizing SWaM subcontractors if awarded a contract. Describe your ability to provide reporting on SWaM subcontracting spend when requested. If your firm or any business that you plan to subcontract with can be classified as SWaM, but has not been certified by the Virginia Department of Small Businessand Supplier Diversity (SBSD), it is expected that the certification process will be initiated no later than the

time of the award. If your firm is currently certified, you agree to maintain your certification for the life of the contract. For assistance with SWaM certification, visit the SBSD website at http://www.sbsd.virginia.gov .

F. **Identification on Proposal Envelope**: The signed proposal should be returned to the University to the attention of the identified Procurement Officer in a sealed envelope or package with the following identifying information on the outside of the sealed envelope/package.

FROM:

Name of Offeror:	RFP#:
Address:	Due date:
	RFP Title: Fertilization Services
City, State, Zip Code:	
	Procurement Officer: Sheryl S. Sullivan
DPOR LICENSE #:	LICENSE CLASS: A B C
State Corp. Comm. License #:	

If the signed proposal is not contained in a sealed envelope or package, the Offeror takes the risk that the envelope, even if marked as described above, may be inadvertently opened and the information compromised which may cause the proposal to be disqualified. Proposals may be hand delivered to the designated location in the office issuing the solicitation. No other correspondence or other offers should be placed in the envelope.

11. SELECTION CRITERIA AND AWARD

A. **Selection Criteria**:
Proposals will be evaluated by Radford University using the following weighted evaluation criteria.

	Evaluation Criteria	**Percentage of Points**
1	Qualifications and experience of Offeror in providing the goods/services.	30%
2	Quality of products/services offered and suitability for the intended purposes.	30%
3	Specific plans or methodology to be used to provide the products/services.	20%
4	Financial (Cost)	10%
5	Participation of Small, Women-Owned and Minority-Owned (SWaM) Businesses.	10%
	TOTAL	100%

B. **Award:** Selection shall be made of two or more Offerors deemed to be fully qualified and best suited among those submitting proposals on the basis of the evaluation criteria included in the Request for Proposals, including price, if so stated in the Request for Proposals. Negotiations shall be conducted with the offers so selected. Price shall be considered, but need not be the sole determining factor. After negotiations have been conducted with each Offeror so selected, Radford University shall select the Offeror which, in its opinion, has made the best proposal, and shall award the contract to that Offeror. Radford University may cancel this Request for Proposal or reject proposals at any time prior to award. Should Radford University determine in writing and in its sole discretion that only one Offeror has made the best proposal a contract may be negotiated and awarded to that Offeror. The award document will be a contract incorporating by reference all the requirements, terms and conditions of the solicitation and the Contractor's proposal as negotiated. See **Attachment B** for sample contract form. **Radford University reserves the right to award multiple contracts as a result of this solicitation.**

12. PROPOSAL PREPARATION AND SUBMISSION:

A. **GENERAL INSTRUCTIONS:**

1) **RFP Responses**: In order to be considered for selection, Offerors shall submit a complete response to this RFP to include.

a. **One (1) original paper copy of the entire proposal, INCLUSIVE OF ALL ATTACHMENTS.** Any proprietary information should be clearly marked in accordance with section 12.A.1.c below.

b. **One (1) electronic copy** in WORD format or searchable PDF (USB/Flash Drive) of the entire proposal as one document, **INCLUSIVE OF ALL ATTACHMENTS** mailed along with the hard copy above. Any proprietary information should be clearly marked in accordance with 12.A.1.c below.

c. Should the proposal contain **proprietary information,** provide **one (1) redacted** electronic copy in WORD format or searchable PDF (USB/Flash Drive) of the entire document **INCLUSIVE OF ALL ATTACHMENTS. All identified proprietary information should be blacked out.** This USB/Flash Drive should be marked **"*Redacted Copy."***

d. Response shall be submitted to**:**

Radford University
Procurement and Contracts Department
Attn: SHERYL S. SULLIVAN
P.O. Box 6885
David E. Armstrong Complex
501 Stockton Street
Radford, VA 24142-6885

Identify the envelope/package as instructed in Attachment A – Terms and Conditions
No other distribution of the proposal shall be made by the Offeror.

B. **PROPOSAL PREPARATION**:

1) **Sign and Complete**: Proposals shall be signed by an authorized representative of the Offeror. All information requested should be submitted. Failure to submit all information requested may result in Radford University requiring prompt submission of missing information and/or giving a lowered evaluation of the proposal. Proposals which are substantially incomplete or lack key information may be rejected by Radford University. Mandatory requirements are those required by law or regulation or are such that they cannot be waived and are not subject to negotiation.

2) **Concise & Clear**: Proposals should be prepared simply and economically, providing a straightforward, concise description of capabilities to satisfy the requirements of the RFP. Emphasis should be placed on completeness and clarity of content.

3) **Organization**: Proposals should be organized in the order in which the requirements are presented in the RFP. All pages of the proposal should be numbered. Each paragraph in the proposal should reference the paragraph number of the corresponding section of the RFP. It is also helpful to cite the attachment, paragraph number, sub letter, and repeat the text of the requirement as it appears in the RFP. If a response covers more than one page, the paragraph number and sub letter should be repeated at the top of the next page. The proposal should contain a table of contents, which cross-references the RFP requirements. Information which the Offeror desires to present that does not fall within any of the requirements of the RFP should be inserted at an appropriate place or be attached at the end of the proposal and designated as additional material. Proposals that are not organized in this manner risk elimination from consideration if the evaluators are unable to find the RFP requirements are specifically addressed.

4) **Word Usage**: As used in this RFP, the terms "must", "shall", "should" and "may" identify the criticality of requirements. "must" and "shall" identify requirements whose absence will have a major impact on the suitability of the proposed solution. Items labeled as "should" or "may" are highly desirable, although their absence will not have a large impact and would be useful, but are not necessary. Depending on the overall response to the RFP, some individual "must" and "shall" items may not be fully satisfied, but it is the intent to satisfy most, if not all, "must" and "shall" requirements. The inability of an Offeror to satisfy a "must" or "shall" requirement does not automatically remove that Offeror from consideration; however, it may seriously affect the overall rating of the Offeror's proposal.

5) **Binding**: The original proposal should be bound or contained in a single volume where practical. All documentation submitted with the proposal should be contained in that single volume.

6) **Ownership:** Ownership of all data, materials and documentation originated and prepared for Radford University pursuant to the RFP shall belong exclusively to Radford University and be subject to public inspection in accordance with the Virginia Freedom of Information Act. Trade secrets or proprietary information submitted by an Offeror shall not be subject to public disclosure under the Virginia of Freedom of Information Act. However, to prevent disclosure the Offeror must invoke the protections of Section 2.2-4342F of the Code of Virginia, in writing either before or at the time the data or other materials is submitted. The written request must specifically identify the data or other materials to be protected and state the reasons why protection is necessary. The proprietary or trade secret material submitted must be identified by some distinct method such as highlighting or underlining and must indicate only the specific words, figures, or paragraphs that constitute trade secret proprietary information. The classification of an entire proposal document, line item prices and/or total proposal prices as proprietary or trade secrets is not acceptable and may result in the rejection of the proposal.

7) **Legal Agreement**: Unless noted in the proposal, a signed and submitted proposal certifies that the firm's principals or legal counsel has reviewed the Request for Proposal General Terms and Conditions and the Special Terms and Conditions and agrees that these provisions will become a part of any final agreement, and that the principals or legal counsel has reviewed and approved the firm's entire proposal prior to submission to the University.

C. **ORAL PRESENTATIONS:** Offerors who submit a proposal in response to this RFP may be invited to give an oral presentation of their proposal to Radford University. This will provide an opportunity for the Offeror to clarify or elaborate on the proposal but in no way will change the original proposal. The University will schedule the time and location of these presentations. Oral presentations may be conducted at the option of Radford University; therefore, proposals should be complete.

13. **OPTIONAL PRE-PROPOSAL CONFERENCE**

A. An optional pre-proposal conference will be held March 13, 2024 at 3:00 PM in the Armstrong Complex, Conference Room #231. The street address is 501 Stockton Street, Radford, VA 24142.

While attendance at this conference will not be a prerequisite to submitting a proposal, Offerors who intend to submit a proposal are encouraged to attend. It is recommended you have a copy of the solicitation readily available to review during the conference.

B. The purpose of the pre-proposal conference is to allow potential Offerors an opportunity to present questions and requests for clarification, with final responses provided in an RFP Addendum that will be published on eVA - Virginia's eProcurement Portal. The Addendum will include any updates to the RFP, including changes as well as responses to questions presented.

IN PERSON ATTENDANCE:
For those who wish to attend in person, you may do so by coming to the Armstrong Complex, Conference Room #231. The street address is 501 Stockton Street, Radford, VA 24142.

ZOOM ATTENDANCE (Registration is required):
You are invited to a Zoom meeting.
When: March 14, 2024 3:00 PM Eastern Time (US and Canada)

Register in advance for this meeting:

https://radford.zoom.us/meeting/register/tJAtdu2hqjksGtaGGFqJMunrvioIbOW3SHrw

PRE-REGISTRATION IS ENCOURAGED. After registering, you will receive a confirmation email containing information about joining the meeting. Please allow a few extra minutes prior to the Pre-Proposal Conference to complete registration and to obtain the link to the meeting via email.

14. **INVOICES and PAYMENT:** Invoices for goods or services provided under any contract resulting from this solicitation should be submitted by email to acctspayable@radford.edu . Invoices shall be identified with the assigned contract number. Invoices

shall identify contract pricing for all good/services payment is being requested. If submitting invoices by mail use the following address. **Email is the preferred method of invoice receipt.**

RADFORD UNIVERSITY
ACCOUNTS PAYABLE
POST OFFICE BOX 6906
RADFORD, VA 24142-6906

Payment will be made thirty days after receipt of proper invoice for the amount of payment due, or thirty days after receipt of goods / services, whichever is later, in accordance with the Commonwealth of Virginia Prompt Pay Act .

15. **ADDENDUM:** Any **ADDENDUM** issued for this solicitation may be accessed on Virginia Business Opportunities by going to www.eva.virginia.gov . Since a paper copy of the addendum will not be mailed to you, we encourage you to check the web site regularly.

16. **COMMUNICATIONS:** Communications regarding this solicitation shall be formal from the date of issue, until either a Contractor has been selected or the Procurement and Contracts Department at Radford University rejects all proposals. Formal communications will be directed to the Contract Officer listed on this solicitation. Reference General Information – Questions/Inquiries. Informal communications, including but not limited to request for information, comments or speculations regarding this solicitation to any University employee other than a Procurement and Contracts Department representative may result in the offending Offeror's proposal being rejected.

17. **TERMS AND CONDITIONS:** This solicitation and any resulting contract/purchase order shall be governed by the attached terms and conditions. See **Attachment A.**

18. **ATTACHMENTS:**

Informative:
Attachment A – Terms and Conditions
Attachment B – Sample of Standard Contract Form
Attachment C – Zone Map for Cooperative Contracts
Attachment G – Nutrient Management Plan
Attachment F – Campus Map

To be Returned:
Attachment D – Vendor Data Sheet (for references)
Attachment E – Pricing Table

Attachment A

TERMS AND CONDITIONS

I. GENERAL TERMS AND CONDITIONS:

See: GENERAL TERMS AND CONDITIONS

II. ADDITIONAL TERMS AND CONDITIONS:

1. **ADDITIONAL GOOD AND SERVICES:** The University may acquire other goods or services that the supplier provides other than those specifically solicited. The University reserves the right, subject to mutual agreement, for the Contractor to provide additional goods and/or services, under the same pricing, terms and conditions and to make modifications or enhancements to the existing goods and services. Such additional goods and services may include other products, components, accessories, subsystems, or related services newly introduced during the term of the contract.

2. **AUDIT:** The Contractor hereby agrees to retain all books, records, and other documents relative to this contract for five (5) years after final payment, or until audited by the Commonwealth of Virginia, whichever is sooner. Radford University, its authorized agents, and/or state auditors shall have full access and the right to examine any of said materials during said period.

3. **AVAILABILITY OF FUNDS:** It is understood and agreed between the parties herein that Radford University shall be bound hereunder only to the extent of the funds available or which may hereafter become available for the purpose of this contract.

4. **CANCELLATION OF CONTRACT:** Radford University reserves the right to cancel and terminate any resulting contract, in part or in whole, without penalty, upon 60 days written notice to the Contractor. In the event the initial contract period is for more than 12 months, the resulting contract may be terminated by either party, without penalty, after the initial 12 months of the contract period upon 60 days written notice to the other party. Any contract cancellation notice shall not relieve the Contractor of the obligation to deliver and/or perform on all outstanding orders issued prior to the effective date of cancellation.

5. **CONTRACT DOCUMENTS:** The contract entered into by the parties shall consist of the Request for Proposal including all addendums thereof, the proposal submitted by the Contractor, the written results of negotiations, the University Standard Contract Form, all of which shall be referred to collectively as the Contract Documents.

6. **IDENTIFICATION OF PROPOSAL ENVELOPE:** The signed proposal should be returned in a separate envelope or package and identified as follows:

From

Name of Offeror	**Due Date**	**Time Due**
Street or Box Number		**Solicitation Number**
City, State, Zip Code		**Solicitation Title**

Name of Procurement Officer:

The envelope should be addressed to:

RADFORD UNIVERSITY
Procurement and Contracts Department
P.O. Box 6885
501 Stockton Street
Radford, Virginia 24142

The Offeror takes the risk that if the envelope is not marked as described above, it may be inadvertently opened and the information compromised, which may cause the proposal to be disqualified. Proposals may be hand delivered to the designated location in the office issuing the solicitation. No other correspondence or other proposals should be placed in the envelope.

7. **NOTICES:** Any notices to be given by either party to the other pursuant to any contract resulting from this solicitation shall be in writing, hand delivered, mailed or electronically submitted to the address of the respective party at the following address:

   If to the Contractor: Address Shown on the RFP Cover Page
   Attention: Name of Person Signing RFP

   If to Radford University:

   RADFORD UNIVERSITY
   Procurement and Contracts Department
   Attn: Contract Officers Name
   P.O. Box 6885
   501 Stockton Street
   Radford, Virginia 24142

8. **PUBLIC POSTING:** Radford University maintains a web-based contract database with a public gateway access. Any resulting cooperative contract(s) to this solicitation will be posted to the publicly accessible website. Contents identified and mutually negotiated, as proprietary information will not be made public.

9. **SEVERAL LIABILITY:** Radford University will be severally liable to the extent of its purchase made against any contract resulting from this solicitation. Applicable entities described herein will be severally liable to the extent of their purchases made against any contract resulting from this solicitation.

III. SPECIAL TERMS AND CONDITIONS:

1. **ACCEPTANCE PERIOD**: Any Proposal received in response to this solicitation shall be valid for SIXTY (60) days. At the end of the SIXTY (60) days the Proposal may be withdrawn at the written request of the Offeror. If the Proposal is not withdrawn at that time it remains in effect until an award is made or the solicitation is cancelled.

2. **ADDITIONAL INFORMATION**: Radford University reserves the right to ask any vendor to submit information missing from its proposal, to clarify its proposals and to submit additional information, which the University deems desirable.

3. **ADVERTISING**: In the event a contract is awarded for supplies, equipment, or services resulting from this solicitation, no indication of such sales or services to Radford University will be used in product literature or advertising. The Contractor shall not state in any of the advertising or product literature that Radford University has purchased or uses its products or services, and the Contractor shall not include Radford University in any client list in advertising and promotion materials without the express written consent of the University.

4. **CODES AND STANDARDS:** All materials, equipment, and installation work shall be in compliance with specifications contained herein and all applicable codes and standards to include the Virginia Uniform Statewide Building Codes.

5. **COMMUNICATIONS**: Communications regarding this Request for Proposals (RFP) shall be formal from the date of issue until either a Contractor has been selected or the University Procurement and Contracts Department rejects all proposals. Formal communications shall be directed to the University Procurement and Contracts Department. Informal communications including but not limited to, request for information, comments or speculations, regarding this RFP to any University employee other than a Procurement and Contracts Department representative may result in the offending Offeror's proposal being rejected.

6. **COMPLETE INFORMATION:** All Offerors shall state manufacturer and product offered, and enclose complete and detailed specifications with Proposal for all products offered. This is required even if quoting on the exact brand name as shown. Failure to do so may cause Proposal to be considered nonresponsive.

7. **CONTRACTOR PERSONNEL**: All employees of the Contractor shall comply with the rules, regulations, policies and procedures of Radford University and shall maintain proper conduct. In the event the University finds, at its sole discretion, that an employee of the Contractor is objectionable to the University that employee shall be removed by the Contractor from University grounds and shall not again be employed by the Contractor on University grounds until approved by the University.

8. **CONTRACTOR'S TITLE TO MATERIALS**: No materials or supplies for the work shall be purchased by the Contractor or by any subcontractor's subject to any chattel mortgage or under a conditional sales or other agreement by which an interest is retained by the seller. The Contractor warrants that there is clear title to all materials and supplies for which Contractor invoices for payment.

9. **DELIVERY AND STORAGE**: It shall be the responsibility of the Contractor to make all arrangements for delivery, unloading, receiving and storing materials in the building during installation. Radford University will not assume any responsibility for receiving these shipments. Contractor shall check with Radford University and make necessary arrangements for security and storage space in the building during installation.

10. **EXTRA CHARGES NOT ALLOWED**: Any quoted prices shall be for complete delivery or installation, ready for Radford University use, and shall include all applicable freight and installation charges; extra charges will not be allowed.

11. **FINAL INSPECTION**: At the conclusion of the work, the Contractor shall demonstrate to the authorized owner's representatives that the work is fully operational and in compliance with contract specifications and codes. Any deficiencies shall be promptly and permanently corrected by the Contractor at the Contractor's sole expense prior to final acceptance of the work.

12. **INSURANCE**: By signing and submitting a Proposal under this solicitation, the Offeror certifies that if awarded the contract, it will have the following insurance coverages at the time the contract is awarded. For construction contracts, if any subcontractors are involved, the subcontractor will have workers' compensation insurance in accordance with §§2.2-4332 and 65.2-800 et seq of the *Code of Virginia*. The Offeror further certifies that the Contractor and any subcontractors will maintain these during the entire term of the contract and that all insurance coverages will be provided by insurance companies authorized to sell insurance in Virginia by the Virginia State Corporation Commission.

    INSURANCE COVERAGES AND LIMITS REQUIRED:
    - ☑ Worker's Compensation - Statutory requirements and benefits.
    - ☑ Employers Liability - $100,000.00
    - ☑ Commercial General Liability - $1,000,000.00 per occurrence and $2,000,00 in the aggregate to include bodily injury and property damage, personal injury and advertising injury, products and completed operations coverage. Radford University shall be named as an additional insured to the policy by endorsement.
    - ☑ Automobile Liability - $1,000,000 combined single limit.
    - ☑ Builders Risk – For all renovation and new construction projects under $100,000 Radford University will provide All Risk – Builders Risk Insurance. For all renovation contracts, and new construction from $100,000 up to $500,000 the Contractor will be required to provide All Risk – Builders Risk Insurance in the amount of the Contract and name Radford University as additional insured. All insurance verifications of insurance will be through a valid insurance certificate.

    The Contractor agrees to be responsible for, indemnify, defend and hold harmless Radford University, its officers, agents and employees from the payment of all sums of money by reason of any claim against them arising out of any and all occurrences resulting in bodily or mental injury or property damage that may happen to occur in connection with and during the performance of the Contract, including but not limited to claims under the Worker's Compensation Act. The Contractor agrees that it will, at all times, after the completion of the work, be responsible for, indemnify, defend and hold harmless Radford University, its officers, agents and employees from all liabilities resulting from bodily or mental injury or property damage directly or indirectly arising out of the performance or nonperformance of the Contract.

13. **LABELING OF HAZARDOUS SUBSTANCES**: If the items or products requested by this solicitation are "Hazardous Substances" as defined by the § 10.1-1400 of the Code of Virginia (1950), as amended, or #§ 1261 of Title 15 of the United States Code, then the Offeror, by submitting its Proposal, certifies and warrants that the items or products to be delivered under this Contract shall be properly labeled as required by the foregoing sections and that by delivering the items or products the

Offeror does not violate any of the prohibitions of the Virginia Waste Management Act, Title 10.1, Chapter 15 of the Code of Virginia. or Title 15 U.S.C. § 1263.

14. **CONTRACTOR/SUBCONTRACTOR LICENSE REQUIREMENT**: By my signature on this solicitation, I certify that this firm/individual and/or subcontractor is properly licensed for providing the goods/services specified

    Contractor Name:_____ Subcontractors Name:_____

    DPOR License #:_____ Type:_____

    SCC License #:_____

    Other:_____

    VDACS Pesticide Applicators Licenses (Include a copy of all licenses for any employees who may perform work on campus. Please attach additional sheets if necessary.):

    License #:_____ Holder:_____

    License #:_____ Holder:_____

    License #:_____ Holder:_____

    License #:_____ Holder:_____

15. **ORDER PLACEMENT**: The University does not place verbal orders for Goods and Services. The University may only place orders for Goods and Services by issuing a formal written Purchase Order in advance delivery of Goods and Services. If the Contractor provides Goods and Services prior to receipt of a formal written Purchase Order or incurs costs in excess of authorized purchase order fee amounts, it does so at its own risk.

16. **PARKING POLICY**: All Contractors' vehicles parked on the Radford University campus must be registered with the Radford University Parking Services Department and display a valid Contractor's parking pass. A pass may be obtained by filling out an application for a Radford University Contractor's Parking Pass and submitting it to the Radford University Parking Services Department. Contractors should be aware that vehicles parked on the Radford University campus without a parking pass or permit are subject to ticketing and fines. Operating vehicles on sidewalks, plazas, and areas heavily occupied by pedestrians is prohibited. In the unlikely event a driver should find it necessary to drive on Radford University sidewalks, plazas and areas heavily used by pedestrians, the driver must yield to pedestrians. For a complete list of parking regulations, please go to http://parking.asp.radford.edu/. Radford University Parking Services may also be contacted by calling (540) 831-6361. The safety of our students, faculty and staff is of paramount importance to us. Accordingly, violators may be charged.

17. **PRIME CONTRACTOR RESPONSIBILITIES**: The Contractor shall be responsible for completely supervising and directing the work under this Contract and all subcontractors that he may utilize, using his best skill and attention. Subcontractors who perform work under this Contract shall be responsible to the prime Contractor. The Contractor agrees that he is as fully responsible for the acts and omissions of his subcontractors and of persons employed by them as he is for the acts and omissions of his own employees.

18. **PRODUCT SUBSTITUTION:** During the term of any contract resulting from this solicitation, the vendor is not authorized to substitute any item for that product and/ or software identified in the solicitation without the prior written consent of the contracting officer whose name appears on the front of this solicitation, or their designee.

19. **QUANTITIES**: Quantities set forth in this solicitation are estimates only, and the Contractor shall supply at Proposal prices actual quantities as ordered, regardless of whether such total quantities are more or less than those shown.

20. **RENEWAL OF CONTRACT**: This Contract may be renewed by Radford University for a period of FOUR (4) one-year periods, only under the terms and conditions of the original Contract. Price increases may be negotiated only at the time of renewal. Written notice of Radford University's intention to renew shall be given (approximately 90 day) prior to the expiration date of each Contract period.

FOR ALL RENEWAL PERIODS UNDER THE CONTRACT: If Radford University elects to exercise the option to renew the Contract for an additional one-year period, the Contract price(s) for the additional year shall not exceed the contract prices of the original Contract increased by no more than the percentage increase of the "Services" category of the CPI section of the Consumer Price Index of the United States Bureau of Labor Statistics, for the latest twelve months for which statistics are available, with a maximum CPI increase capped at no more than four percent (4%) per year.

21. **SAFETY**: The Contractor bears sole responsibility for the safety of its employees. The Contractor shall take all steps necessary to establish, administer, and enforce safety rules that meet the regulatory requirements of the Virginia Department of Labor and Industry (VDLI) and the Occupational Safety and Health Administration (OSHA). The Contractor shall take steps as necessary to protect the safety and health of University employees, students, and visitors during the performance of their work. In addition, the Contractor must also provide the University with a written safety program that it intends to follow in pursuing work under this contract. No work under this Contract will be permitted until the university is assured that the Contractor has an adequate safety program in effect.

22. **SAFETY DATA SHEETS (SDS)**: Safety Data Sheets and descriptive literature shall be provided with the Proposal/Bid for each chemical and/or compound offered. Failure on the part of the Offeror/Bidder to submit such data sheets may be cause for declaring the Proposal/Bid as nonresponsive.

23. **SUBCONTRACTS**: No portion of the work shall be subcontracted without prior written consent of Radford University. In the event that the Contractor desires to subcontract some part of the work specified herein, the Contractor shall furnish Radford University the names, qualifications and experience of their proposed subcontractors. The Contractor shall, however, remain fully liable and responsible for the work to be done by his subcontractor(s) and shall assure compliance with all requirements of the Contract.

24. **VIRGINIA FREEDOM OF INFORMATION ACT**: Except as provided, once an award is announced, all proposals submitted to this RFP will be open to inspection by any citizen, or interested person, firm or corporation, in accordance with the Virginia Freedom of Information Act. Trade secrets or proprietary information submitted by a firm prior to or as part of its proposal will not be subject to public disclosure under the Virginia Freedom of Information Act only under the following circumstances: (1) the appropriate information is clearly identified by some distinct method such as highlighting or underlining; (2) only the specific words, figures, or paragraphs that constitute trade secrets or proprietary information are identified; and (3) a summary page is supplied immediately following the proposal title page that includes (a) the information to be protected, (b) the section(s)/page number(s) where this information is found in the proposal, and (c) a statement why protection is necessary for each section listed. The firm must also provide a separate electronic copy of the proposal (CD, etc.) with the trade secrets and/or proprietary redacted. *If all of these requirements are not met, then the firm's entire proposal will be available for public inspection.*

25. **WARRANTY (COMMERCIAL)**: The Contractor agrees that the supplies or services furnished under any award resulting from this solicitation shall be covered by the most favorable commercial warranties the Contractor gives any customer for such supplies or services and that the rights and remedies provided therein are in addition to and do not limit those available to Radford University by any other term of this solicitation. A copy of this warranty must be furnished with the Proposal.

26. **WORK SITE DAMAGES**: Any damage to existing utilities, equipment or finished surfaces resulting from the performance of this Contract shall be repaired to the Owner's satisfaction at the Contractor's expense.

Attachment B

SAMPLE CONTRACT FORM
Standard Contract form for reference only
Offerors do not need to fill in this form.

RADFORD UNIVERSITY

STANDARD CONTRACT
Contract Number: RUxxxxx

This contract entered into this __ day of _____, 20__, by _____, located at (insert complete physical address), hereinafter called the "Contractor" and Commonwealth of Virginia, **Radford University**, called the "Purchasing Agency or Radford University", located at 801 East Main Street, Radford, VA. 24142."

1. **WITNESSETH** that the Contractor and Radford University, in consideration of the mutual covenants, promises and agreements contained, agree as follows:

2. **SCOPE OF CONTRACT:** The Contractor shall provide _____ to Radford University as set forth in the Contract Documents.

3. **TERM OF CONTRACT:** From _____ through _____ with _____ **(number of years) year renewal options or as negotiated, to include all contractual provisions contained herein.**

4. **THE CONTRACT DOCUMENTS SHALL CONSIST OF:**

   This signed Radford University Standard Contract. Document;

   Radford University's Request for Proposal (RFP) Rxx-xxx dated _____, Addendum xxx dated _____ (list all addendums in this format).

   Contractor's Proposal signed and dated _____

   Negotiation Summation: **(List each document by title and execution date)**

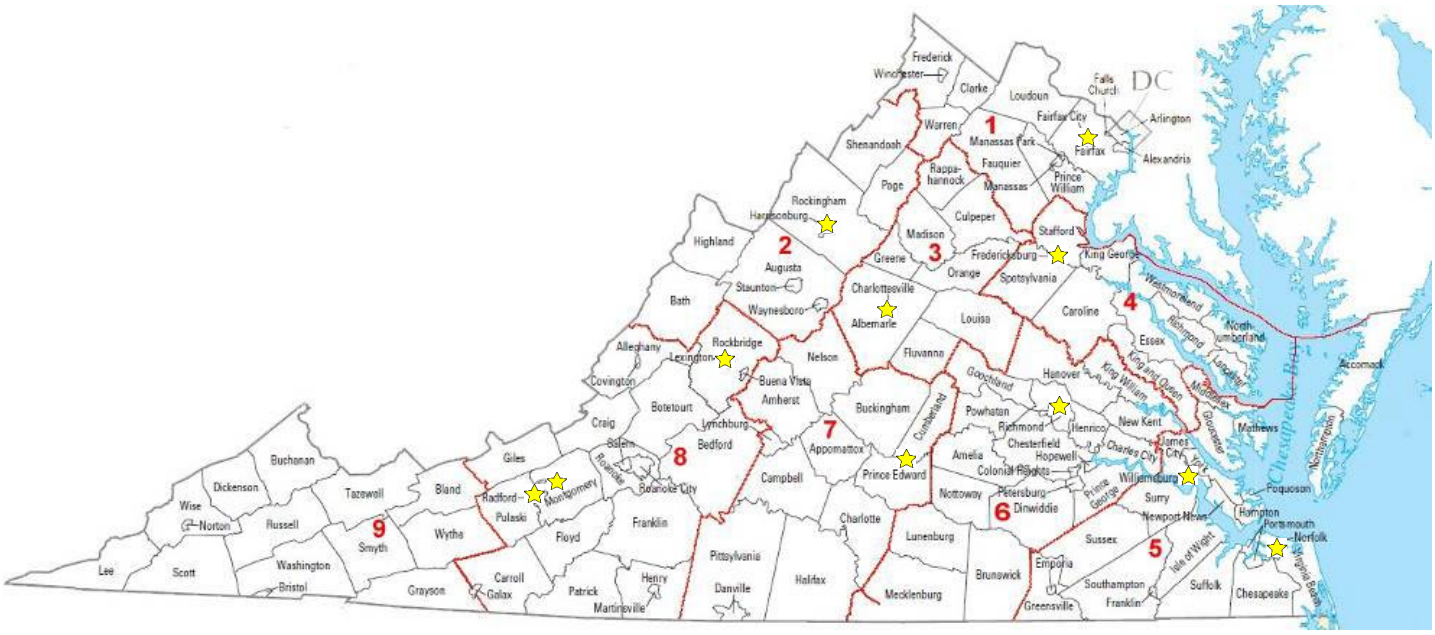
5. **COMPENSATION AND METHOD OF PAYMENT:** The Contractor shall be paid by Radford University in accordance with the contract documents. **(*Note: If advantageous you can list compensation here.)**

IN WITNESS WHEREOF, the parties have caused this Contract to be duly executed intending to be bound thereby.

CONTRACTOR:	**RADFORD UNIVERSITY**
Print Name: _____	**Print Name:** _____
Title: _____	**Title:** _____
Signature: _____	**Signature:** _____
Date: _____	**Date:** _____

Attachment C

Zone Map



Virginia Association of State College & University Purchasing Professionals (VASCUPP)

List of member institutions by zones

Zone 1 George Mason University (Fairfax)	**Zone 2** James Madison University (Harrisonburg)	**Zone 3** University of Virginia (Charlottesville)
Zone 4 University of Mary Washington (Fredericksburg)	**Zone 5** Christopher Newport University (Hampton) College of William and Mary (Williamsburg) Old Dominion University (Norfolk) Norfolk State University (Norfolk)	**Zone 6** Virginia Commonwealth University (Richmond)
Zone 7 Longwood University (Farmville)	**Zone 8** Virginia Military Institute (Lexington) Virginia Tech (Blacksburg) Radford University (Radford)	**Zone 9**

The zone map is provided for the Offeror to determine appropriate pricing structures based on approved zones for cooperative institutions. If no other prices are offered, pricing provided will apply to all zones in the Commonwealth of Virginia. If you wish to provide pricing for a zone other than which this solicitation originated, please indicate you are doing so in the response. If you anticipate pricing differentials for different zones, a separate pricing sheet must be submitted for each zone that includes appropriate pricing for that zone.

Attachment D – VENDOR DATA SHEET

*Note: The following information is required as part of your response to this solicitation. Failure to complete and provide this sheet may result in finding your bid/offer nonresponsive.

Qualifications: The vendor must have the capability and capacity in all respects to satisfy fully all of the contractual requirements.

Vendor's Primary Contact:

NAME: **PHONE:**

Year's in Business: Indicate the length of time you have been in business providing this type of good or service:
YEARS: **MONTHS:**

References: Indicate below a listing of at least four (4) current or recent accounts, either commercial or governmental, that your company is servicing, has serviced, or has provided similar goods/services. Include the length of service and the name, address and telephone number of the point of contact.

Company:	**Contact:**
Phone: ( ) **Fax: ( )**	**Email:**
Project:	
Dates of Service:	**$ Value:**

Company:	**Contact:**
Phone: ( ) **Fax: ( )**	**Email:**
Project:	
Dates of Service:	**$ Value:**

Company:	**Contact:**
Phone: ( ) **Fax: ( )**	**Email:**
Project:	
Dates of Service:	**$ Value:**
Company:	**Contact:**
Phone: ( ) **Fax: ( )**	**Email:**
Project:	
Dates of Service:	**$ Value:**

I certify the accuracy of this information.

Signed:_____

Title:_____

Date:_____

Attachment E – Pricing Table

Attachment E is to be completed and submitted by the Offeror as part of a complete proposal. Offeror shall identify all costs associated with providing the goods/services as specified in this document and should submit firm fixed pricing for each category below. Offerors may include quotes, worksheets, or other information with their proposal, but the official pricing must be included in the pricing table provided.

A. Annual Chemical Application Services

(Reference section **9. STATEMENT OF NEEDS Sections A & B**; for requirements and expectations)

Includes: **Fertilization**
Weed Control, Pre-Emergent
Weed Control, Post-Emergent
Records and response time

Item	*Description*	*Annual Price ($)*
1	Annual Firm Fixed Price, Materials	$
2	Annual Firm Fixed Price, Labor	$
	TOTAL ANNUAL SUM **(Annual Firm Fixed Price, Materials + Annual Firm Fixed Price, Labor) =**	$

B. Individual Item Service Requirements

(Reference section **9. STATEMENT OF NEEDS Section D**; for requirements and expectations) The quantities specified in Section B. are intended solely to facilitate the evaluation process to ascertain the pricing structure applicable to the Per Unit Rate listed below. These quantities do not represent the full requirements of the University, which may vary depending on need.

Item	*Description*	*Per Unit Rate (specified below)*	*Unit Price ($)*	*Estimated Quantity*	*Total*
1	Weed Control (Crack and Crevice) Section 9.D.1	Individual per hour	$	80	$
2	Lime or Gypsum Section 9.D.2	Application per 1000 FT^2 (square feet)	$	300,000	$
3	Granular Insect Control Section 9.D.3	Application per 1000 FT^2 (square feet)	$	300,000	$
4	Granular Disease Control Section 9.D.4	Application per 1000 FT^2 (square feet)	$	300,000	$
5	Tank Spray Section 9.D.5	Application per 1000 FT^2 (square feet)	$	300,000	$
6	Granular Fertilization Section 9.D.6	Application per 1000 FT^2 (square feet)	$	300,000	$
				TOTAL INDIVIDUAL ITEM SUM =	$

ANNUAL GRAND TOTAL SUM **(TOTAL ANNUAL SUM of Section A + TOTAL INDIVIDUAL ITEMS SUM of Section B) =**	**$**

Attachment F - Campus Map

N W E S

0 500 1,000 2,000 US Feet

Estimations based off of aerial imagery digitization with a vintage of February 2022 rounding to nearest 100ft².

Grass Areas
Radford University
Main Campus

TOTAL GRASS AREA = 3,801,389ft²

- AERATE |1,094,807ft²
- MAIN CAMPUS NORTH & SOUTH = 1,366,500ft²
- DEDMON ATHLETIC COMPLEX EAST & WEST =1,600,557ft²
- 915 TYLER AVE = 45,494ft²
- ATHLETIC FIELDS = 654,627ft²
- I.M. & 219 E MAIN ST 134,300ft²
- MULCH | 287,700ft²
- FACILITY

For general reference only!
For internal use only!
Not for distribution!

RADFORD UNIVERSITY
FACILITIES MANAGEMENT

Path: G:\RPS_GIS\PROJECTS\GROUNDS_MAPPING\SPECIAL_INQUIRY_4_YARD_AREAS_FERTILIZER_AERATION.aprx

BKS, May 4, 2023

Attachment G

2021 Nutrient Management Plan

Prepared For:

Radford University
Christopher Shelton – Landscape Superintendent
801 East Main Street
Radford, Virginia 24142
540-831-7767

Prepared By:

Five Oaks Agronomy Consulting
Robert Habel, CNMP
192 Briarherst Drive
Amherst, Virginia 24521
Cell: 434-665-2813
habelrf@gmail.com
Certification Code: 654

Acreage - 9 Fields, 6 Common Areas, 11 Soil Samples (Breakdown on Page 4)	
Total:	94.6

County:	City of Radford
Watershed:	NE57 – Upper New River, Back Creek, Connelly's Run

Plan Written: June 1, 2021

Plan Expires: June 1, 2024

Planner Signature

Contents

Sources:

Maps – Maps are produced using Google Earth or provided by client.
Photos/Logos – Obtained from client, clients website, or taken by planner.
Site information – Obtained from client or clients website.
Technical Information –

Agronomy Handbook – A&L Labs – 2001
Best Golf Course Management Practices – McCarty – 2001
Environmental Best Management Practices for Golf Courses – Virginia GCSAA – January 2012
Golf Course Management and Construction, Environmental Issues – Balogh, Walker, USGA – 1992
Soil Fertility and Fertilizers 6th Ed. – Havlin, Beaton, Tisdale, Nelson – 1999
Spectrum Analytic Agronomic Library – www.spectrumanalytic.com
Sports Turf Management in the Transition Zone – Goatley, Askew, Ervin, Mcall, VSTMA, Etc. – 2008
Turf Management for Golf Courses 2nd Ed. – Beard, USGA – 2002
Turfgrass Soil Fertility and Chemical Problems – Carrow, Waddington, Rieke – 2001
Urban Nutrient Management Handbook – VA DCR, Virginia Tech, Virginia State Uni. – May 2011
Virginia Nutrient Management Standards and Criteria – Commonwealth of Virginia – July 2014

Disclaimer: *Statements and recommendations made within this document based on published research data and experience. Recommendations are based on the soil tests included in this document and not intended for use on any other facility. Products suggested are used in methods suggest by label guidelines when available, be sure to read label before using products as labels can change. Maximum rates are provided by Virginia Department of Conservation and Recreation Standards and Criteria and are not to be exceeded even when product label suggests otherwise. No guarantee or warranty is made, expressed or implied, concerning crop performance as a result of using the contents of this document.*

1. Narative

1.1. Statement of Compliance

As a State-Owned Land, Radford University is required to have and follow a Nutrient Management plan. Thus, they agree to comply with all requirements set forth in the Nutrient Management Training and Certification Regulations, 4VAC50-85-10 et seq., and to follow recommendations for turf fertilization and management as described in the Virginia Nutrient Management Standards and Criteria, Revised July 2014. This includes implementing this Department of Conservation and Recreation approved Nutrient Management Plan and maintaining fertilization records. All nutrient applications to Radford University property, performed by Radford University staff or other contractors, shall comply with the provisions of this Nutrient Management Plan as of June 1, 2021. This plan is affective for three years (until June 1, 2024) or until major renovations or major changes to maintenance practices occur. The planner should be alerted if this occurs or if new soil tests are taken within the three-year period, a minor revision may be needed if tests show major differences. The process of updating this plan for a new three-year cycle should begin no later than 6 months prior to plan expiration.

1.2. Plan Overview

This plan covers 93.9 acres including 5 warm season athletic fields, 4 cool season athletic fields and 6 cool season common areas scattered across the Radford University campus. Each location will be discussed separately.

Radford University is a comprehensive, midsize public university that is student-focused, providing its more than 9,700 students a diversity of outstanding academic programs. Well known for its strong faculty/student bonds, innovative use of technology in the learning environment and vibrant student life on a beautiful campus, Radford University offers many opportunities to get involved and succeed in and out of the classroom.

Radford University welcomes students from the Commonwealth of Virginia, across the country and around the world. Here, you will find inspiration in the surroundings – the manicured green lawns on campus, the steady roll of the New River, the wonders along the Blue Ridge Parkway, the stately university buildings and a quaint downtown. Radford's more than 150 undergraduate and graduate programs offer every student the opportunity to discover new talents, develop leadership skills, and experience personal growth.

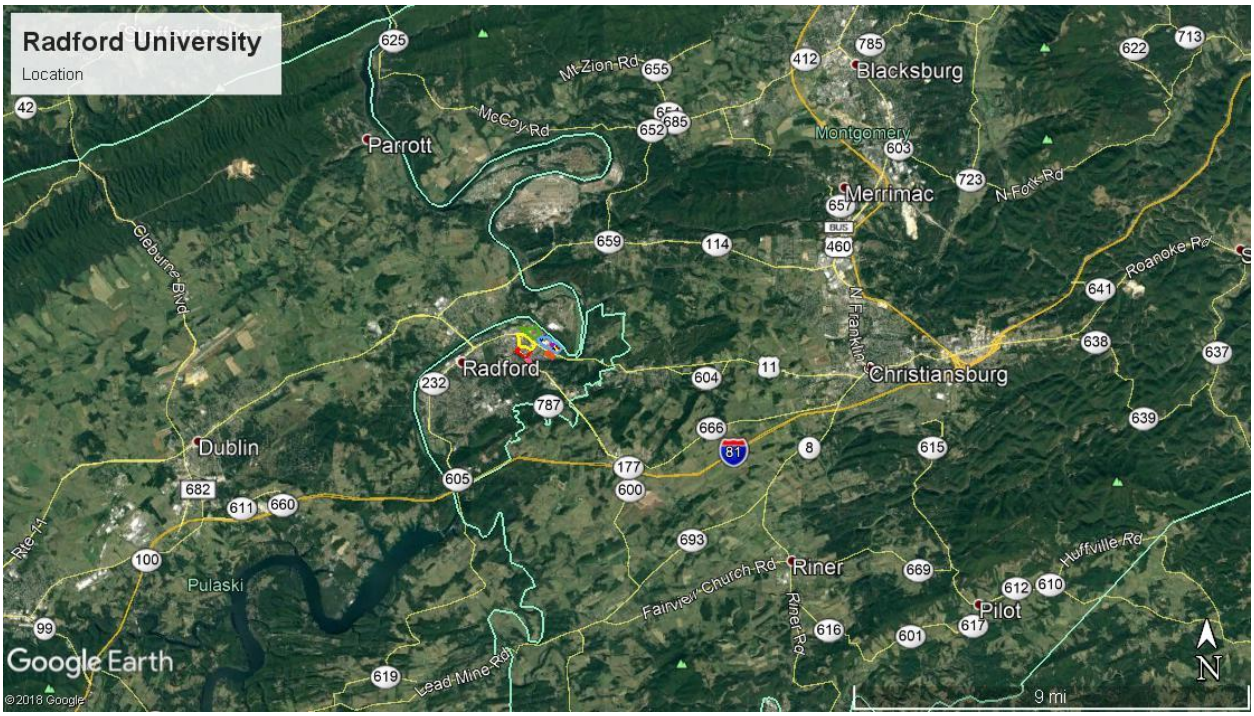
Radford University is committed to being a model for sustainable campus practices and policies and recognized for their stewardship of economic, social, and environmental resources and for their academic commitment to sustainability. For more info on Radford's sustainABILITY program, visit (http://www.radford.edu/content/sustainability/home.html).

1.3. Location

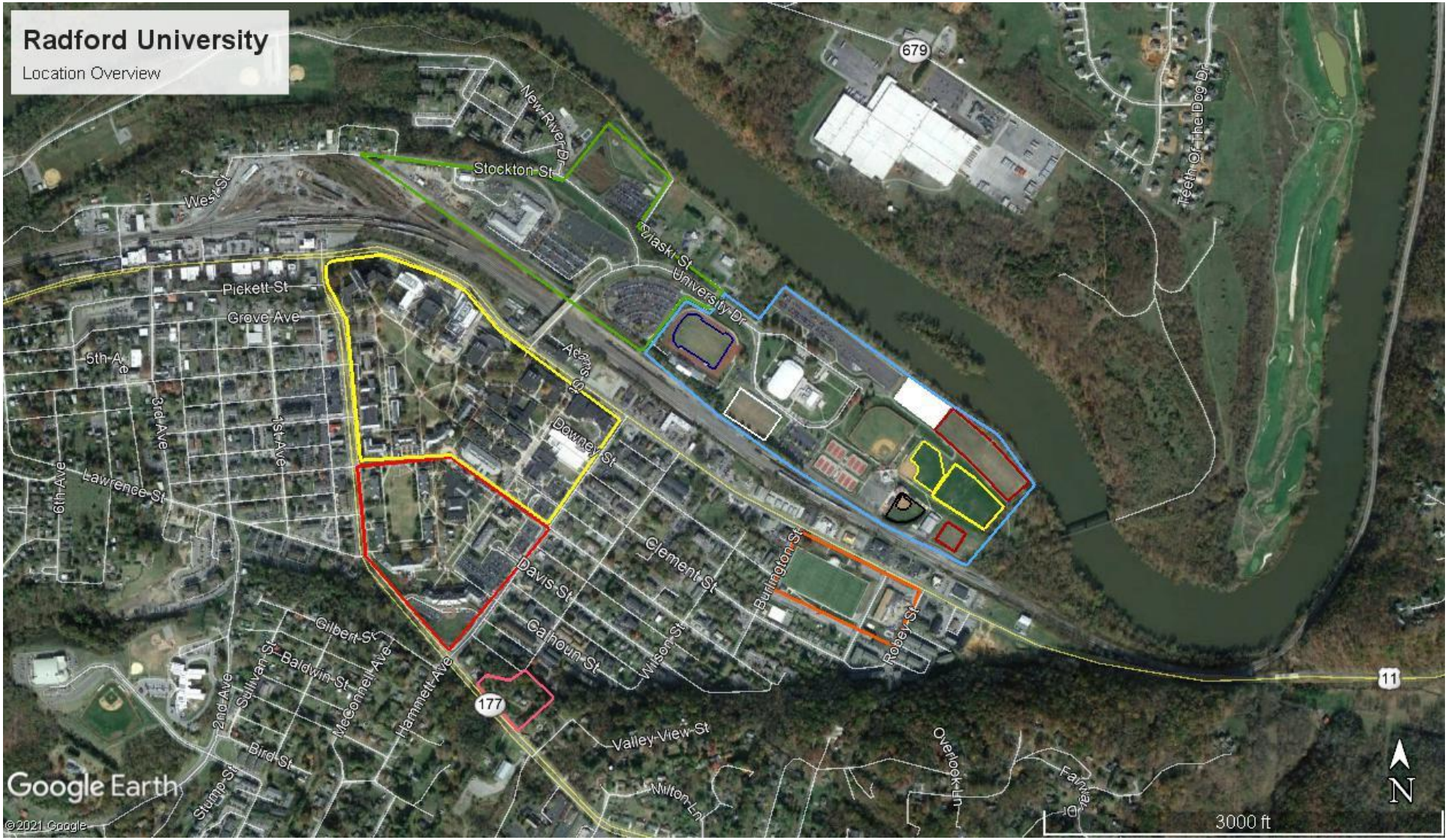
Radford is just 36 miles southwest of the city of Roanoke, and within easy driving distance of many mid-East Coast metropolitan areas. Richmond is only a three-and-a-half-hour drive, while Washington, D.C., and the Tidewater area are only about four and a half hours away.

From Interstate 81, take Exit 109 onto Route 177/Tyler Avenue into Radford. At the third traffic light, turn right onto Jefferson Street. At the next traffic light, turn left onto East Main Street. The main university entrance will be on your left, at the intersection with University Drive. Visitors to the Dedmon Center should turn right on University Drive to reach the facility.

GPS: 37.138088, -80.550010



Location/Acreage/Watershed Code Breakdown					
Location	**Acres**	**Grass**	**Irrigation**	**Color**	**Watershed**
Campus - North	23	Cool			**NE57 94.6 Acres**
Campus – South	14	Cool			
Dedmon – West	17	Cool			
Dedmon – East	20	Cool			
Fields located in Dedmon East					
Cupp Stadium	2.3	Warm	Yes		
Field Hockey	2	Warm	Yes		
Softball	0.7	Warm	Yes		
Practice Fields – Upper and Lower	4.6	Warm	Yes		
IM Middle, Softball, Rugby	6.5	Cool	Yes		
IM/Rec Sports Complex Common Area	3.3	Cool			
Residential Area	1.2	Cool			
Total	94.6				


Radford University
Location Overview
679
New River Dr
Stockton St
West St
Pickett St
Grove Ave
5th Ave
3rd Ave
1st Ave
6th Ave
Lawrence St
Sklaski St
University Dr
Downey St
Clement St
Burlington St
Robey St
Davis St
Calhoun St
Wilson St
Gilbert St
Baldwin St
Sullivan St
McConnell Ave
Hammett Ave
2nd Ave
Bird St
Stump St
177
11
Valley View St
Milton Ln
Overlook Ln
Fairview Dr
Teeth Of The Dog Dr
Google Earth
©2021 Google
3000 ft
N

1.4. Nutrient Management Principals

Nutrient Management Plans focus on two primary objectives healthy plants and clean water.

There are four different types of elements essential for plant health. Non-mineral, Primary and Secondary elements are all considered Macronutrients. The fourth is Micronutrients. Non-mineral elements consist of carbon, hydrogen, and oxygen; these elements are obtained from air and water. The Primary nutrients are nitrogen, phosphorus, and potassium. Secondary elements are calcium, magnesium, and sulfur. Micronutrients are iron, manganese, boron, zinc copper, molybdenum, chlorine, cobalt, and nickel. These elements are obtained from the soil and must be supplemented with fertilizer, lime or other soil amendments when a soil test shows a deficiency. In high maintenance situations, some elements are spray applied and absorbed through the leaf tissue.

Nitrogen and phosphorus are the focus of a nutrient management plan, as these nutrients cause ecological problems. Lime is also important because having improper pH can make applied fertilizers unavailable to the plant and more likely to leach or runoff. While nitrogen and phosphorus are the focus, other nutrients are also discussed in the plan, these nutrients are beneficial to plant health, but do not cause water quality problems.

Soil tests are required to determine the current level of soil nutrients available to the plant so fertilizer can be applied at rates that ensure excess nutrients do not enter our waters. Basic soil tests provide data on phosphorus, potassium, magnesium, calcium and pH. Nitrogen cannot be tested for using a basic soil test as it is very volatile. Magnesium and calcium are included in basic soil tests so that proper liming materials can be chosen.

Soil test results are compared to a reference guide provided by DCR. These Standards and Criteria are based upon years of scientific research and the rates suggested are optimal for plant health within the intended usage. Low input areas, like home lawns, require some fertilizer to maintain plant vigor thus maintaining turf cover and preventing erosion. High use areas, like sports fields, require frequent fertilizer input to help maintain plant health and to aid in recovery from stress. Clean water is maintained by applying fertilizer in a responsible manner that ensures minimum movement away from the intended site.

The following information discusses the role of the nutrients in the plant. Highlighted information is specific to this plan.

Nitrogen (N) – This element is responsible for green color, shoot growth and density, root growth, carbohydrate reserves, recuperative potential, heat, cold, drought hardiness, wear tolerance, and disease susceptibility. Nitrogen has a very complex cycle and only certain forms are available to the plant. It leaches through the soil rapidly and does not accumulate thus you cannot soil test for N. Due to these factors, nitrogen management is a large part of nutrient management. Nitrogen management includes but is not limited to using slow release materials, timing the applications in accordance with plant growth, and making multiple applications so that the element is available when it is needed by the plant.

There are multiple nitrogen rates used in this plan. Slow release products were used exclusively. Labels are included at end of plan. If making changes, please continue to use slow release fertilizers, or contact your planner for help determining the proper rates.

Phosphorus (P) – Phosphorus controls the establishment rate of newly seeded turf, plant maturation, root growth, and seed production. Like nitrogen, P also has a complex cycle. The major difference is that P readily attaches soil, it can be quantified by a soil test and only

leaches when it completely saturates the soil. Phosphorus moves away from the application site when it is improperly applied to compacted soil or other impervious surfaces, when applied in excess, and since it attaches to the soil, with sediment rich runoff. Phosphorus management is also important to nutrient management. It should only be applied when called for by a soil test, to soils that are not compacted to prevent runoff and only applied to actively growing turf with sufficient turf cover/rooting to hold the soil in place.

Maximum P rates are outlined in application worksheets. Do not exceed this number.

Potassium (K) - Potassium is responsible for root growth, heat, cold, and drought hardiness, wear tolerance, and disease susceptibility. While the *Standards and Criteria* do regulate the application of K, but in some cases, K input may exceed recommended levels, as it does not have the same detrimental effects on the health of Virginia's waters as N and P. Potassium is considered the plant nutrient most responsible for turf quality. It helps plants respond to stresses like drought, extreme heat/cold, and insect/disease pressure. The plants increased ability to respond to stress in a positive manner can help reduce the need for increased N and P fertility and reseeding caused by stress. In addition to the benefits of K, it is difficult to limit the amount of K used as most modern slow release fertilizers contain both N and K while limiting or completely removing P. Nitrogen only products are not readily available in slow release form and custom blended fertilizers are expensive.

Potassium levels have been exceeded in most of areas of this plan. As discussed above, K helps the plant deal with stress. Sports fields and common areas are generally stressed be it from excessive use, compaction, improper pH, or lack of proper care due to budget and personnel restraints.

Lime - Liming is a critical management practice for maintaining soil pH at optimal levels for plant growth. Liming supplies the essential elements Calcium and/or Magnesium, reduces the solubility and potential toxicity of Aluminum and Manganese, and increases the availability of essential nutrients. Many soil elements change form because of chemical reactions in the soil due to pHs that are either too acidic or too basic. Plants may not be able to use elements in some of these forms making some elements essential to plant health unavailable. Most plants grow well in the pH range 5.8 to 6.5.

Buffer pH is used to provide an indication of the soil's total (active + reserve) acidity and ability to resist a change in pH. This buffer measurement is the major factor in determining the amount of lime to apply. The Buffer pH starts at 7 (no lime needed) and goes lower as the soil's total acidity increases and more lime is needed to raise the soil pH. As an example, a clay soil with a pH of 6.1 could have a buffer pH of 6.8 and need 1 ton/A of lime in order to maintain/increase that pH around 6.2. A sandy soil could have a much lower pH but have the same buffer pH thus, needing the same amount of lime to change the pH to 6.2. This is because sandy soils have a lower cation exchange capacity thus, less storage for reserve acid.

Attempting to change the pH in the deep rooting zone of an established turf is difficult at best. One method of getting lime somewhat deeper in established turf areas is to apply lime in conjunction with aeration. Applying lime in the fall and winter months is recommended because the freeze/thaw cycle aids in mixing lime throughout the root zone.

Lime provides the essential nutrients Calcium and Magnesium. Calcium is the main component of plant cell walls while magnesium is the atom upon which chlorophyll is built. It is important that these elements be present in the soil not only to help regulate the soils acidity but to insure plant health. When a soils pH is acidic, these elements can be added with lime. Calcitic

lime should be used when calcium is deficient, and magnesium is high. Dolomitic lime, which is more common, is used when the both are deficient or balanced. If pH does not need to be adjusted, calcium levels can be raised with gypsum and magnesium is raised with Epsom salts. The *Standards and Criteria* provide guidance on adjusting soil pH levels but do not include any recommendations for Ca or Mg, as they do not affect water quality.

Not all liming materials are the same, if the liming material chosen does not equate to 100% Calcium Carbonate Equivalent (CCE% should be listed on bag) see chart on page 83 to adjust the required amount of lime.

Lime specifics are discussed in each section.

Sulfur (S) - Sulfur is responsible for the plants green color, shoot growth and density, root growth, carbohydrate reserves, and disease susceptibility. Elemental sulfur applications should be avoided unless you are attempting to acidify (lower pH) the soil and should be applied at no more than 5#/M and watered in due to the turf burn potential. Unless called for by a soil test, the occasional use of sulfur containing fertilizers and micro nutrient packages should be the only S input needed to supplement the soil S content. This element is not included in the *Standards and Criteria*.

Iron (Fe) – Iron contributes to the plants green color, shoot growth and density, root growth, carbohydrate reserves, heat, cold and drought hardiness and wear tolerance. Iron is often included in fertilizer and micronutrient blends because it produces a faster greening of turf than nitrogen. According to the *Standards and Criteria,* Fe applications can be occasionally substituted for N applications because it produces greening. This is a good strategy, but Fe apps cannot replace N. While Fe is used inside the plant, the greening created by Fe is superficial and caused by the iron rusting on the plants surface. Fe should be used as an N replacement only when the plant is healthy, and greening is desired without increased growth.

Micros – Other micronutrients are not mentioned by the *Standards and Criteria*. These elements are very important to plant growth, but regular input is not needed unless you are managing a sand-based soil with low nutrient holding capacity. Most soils contain all the necessary micros and they will be available for the plant if the proper pH is maintained.

1.5. Best Management Practices for Water Quality Protection

The following list comes from the *Urban Nutrient Management Handbook* page 8-12 and details steps that can reduce the impact of nutrient management practices on water quality. A PDF of the complete handbook can be found online through ext.vt.edu, on the CD provided with the plan or a printed copy can be obtained from DCR.

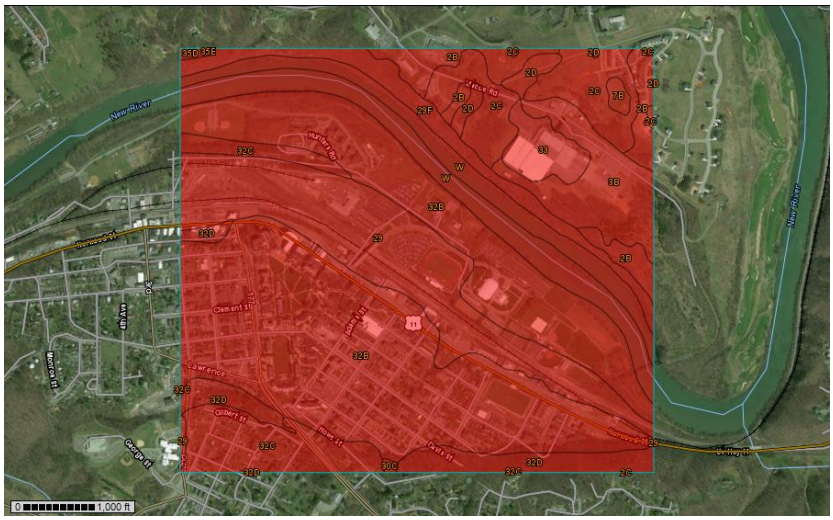
- Base fertilization practices on a soil test.
- Supplement the soil test with a plant tissue test when necessary.
- Aerate compacted soil to reduce runoff and aid phosphorus and lime in entering the soil.
- Minimize fertilizer rates on slopes and sandy soils. If using quickly available sources of nitrogen on deep, sandy soils or near shallow water tables, use no more than 0.25 to 0.50 pound of nitrogen per 1,000 square feet per application.
- Establish and maintain a buffer zone of reduced- to zero-input vegetation around bodies of water. In some cases, native vegetation might be appropriate, but whatever plant material is selected, it must persist indefinitely to serve as a functional buffer zone.
- Consider using iron as a supplement to nitrogen for greening response.
- Use at least 50 percent slowly available sources of nitrogen on soils subject to leaching.
- Time applications carefully. Do not apply fertilizer before a heavy rainfall.
- Irrigate lightly (0.10 to 0.25 inch) after each application of quick-release fertilizer so it is washed off the foliage and moved into the soil. (Wait to irrigate if foliar activity is desired)
- Avoid over irrigation.
- Return grass clippings to the turf to improve nutrient cycling and reduce the amount of fertilizer needed to produce healthy plants. Use a mulching mower whenever possible and consider that a mulching mower can even be used to manage fall leaves (Goatley 2006).
- When collected, compost grass clippings rather than disposing of them in landfills.
- Use a drop (gravity) spreader near bodies of water or impenetrable areas to lessen the chance of spreading material on these surfaces.
- Perhaps the most important best management practice toward improving water quality is to simply sweep or blow fertilizers and clippings off hardscape surfaces and back into the turf.

1.6. Application Equipment Calibration

An agronomically and environmentally sound fertilizer program can be negated by improperly calibrated equipment. It is important to calibrate your equipment prior to every application. Even moving from one location to another can knock your application equipment out of adjustment so once you have your equipment calibrated for a particular product write down the setting. Use that setting to check the calibration for every site and adjust if necessary. The next time you use that product, use your records as a starting point and not a final calibration as equipment can wear over time thus changing the calibration point. For more information on how to calibrate your equipment see the *Urban Nutrient Management Handbook* Chapter 10 (ext.vt.edu) or visit your equipment manufactures website. Please remember that the number on the bag is not sufficient, every spreader and every application is different, and that the bag number only serves as a calibration starting point.

1.7. Environmentally Sensitive Areas/Concerns

- The New River flows to the north of the fields. There is a sufficient buffer and a berm to protect the river, but fertilizer apps should be avoided when heavy rain is expected.
- According to Web Soil Survey, there is no indication of flood risk in this area.
- There are roads, sidewalks and storm water drains throughout the area. Be cautious when making fertilizer applications near these areas and always clean up any fertilizers accidently spread on pavement and sidewalks. If possible, cover drains to prevent direct application of fertilizer to water.
- Applications of inorganic fertilizers will not occur on frozen or snow-covered ground.
- Any fertilizer that makes its way onto impervious surfaces (sidewalks, roads, etc.) should be swept or blown back into pervious turfgrass-covered areas.
- Cover any catchment basins before applying fertilizer so product is not applied directly into these runoff catchment systems.
- Do not use fertilizers as ice melt.
- With the numerous small areas, a narrow drop spreader would be a wonderful application tool to have; at minimum, a broadcast spreader with a right-side shield and cutoff is suggested.



Flooding Frequency Class Designations *– Areas indicated as flood prone by Web Soil Survey. Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.*

Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent.

	"None" means that flooding is not probable. The chance of flooding is nearly 0 percent in any year. Flooding occurs less than once in 500 years.
	"Very rare" means that flooding is very unlikely but possible under extremely unusual weather conditions. The chance of flooding is less than 1 percent in any year.
	"Rare" means that flooding is unlikely but possible under unusual weather conditions. The chance of flooding is 1 to 5 percent in any year.
	"Occasional" means that flooding occurs infrequently under normal weather conditions. The chance of flooding is 5 to 50 percent in any year.
	"Frequent" means that flooding is likely to occur often under normal weather conditions. The chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year.
	"Very frequent" means that flooding is likely to occur very often under normal weather conditions. The chance of flooding is more than 50 percent in all months of any year.

1.8. Season of Fertilization

Per the Virginia Nutrient Management Standards and Criteria, Revised July 2014, fertilizers must be applied in between the following dates.

- These are guidelines and averages, in warmer years, fertilizer could be applied earlier and in cooler years, fertilizer should be applied later.
- Fertilizers should not be applied to frozen ground or to grass that is not actively growing. For warm season grasses please wait for green up to occur.
- For warm season grasses that are overseeded, follow the cool season application window. If overseeding is skipped, please revert to warm season window.
- The acceptable nitrogen fertilizer application season for non-overseeded warm season turfgrass begins no earlier than the last spring average killing frost date and ends no later than one month prior to the first fall average killing frost date.
- The nutrient management recommended application season for nitrogen fertilizers to cool season turfgrasses begins six weeks prior to the last spring average killing frost date and ends six weeks past the first fall average killing frost date.

Data for frost date comes from the Northeast RCC CLIMOD 2 Frost/Freeze Summary for Christiansburg, VA climate station.
http://climod2.nrcc.cornell.edu/

	Average Frost Dates	Cool Season Applications	Warm Season Applications
Spring	April 16	March 5	April 16
Fall	October 23	December 4	September 23

Maps - *Satellite and topo maps created using Google Earth are to scale as shown in bottom left of each map. For all maps, unless otherwise indicated, North is oriented towards top of page.*

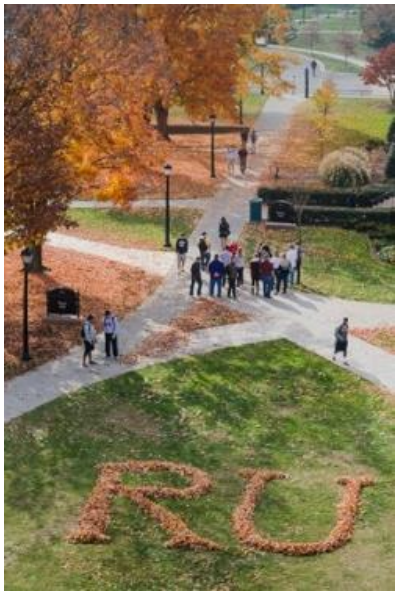
Nutrient Applications - *Each location addressed by this plan has its own section. Some sections cover multiple management areas. A nutrient application worksheet for each management area of that location is included as the last page(s) of that section of the plan. Application records are all located in one section together or on the disk provided. A blank worksheet is also included on the disk to help with calculations if any changes in fertilizer analysis occur. Do not hesitate to call if there are questions.*

2. Management Areas

For sections 2, 3 and 4, sub headings will refer to the same location. Details of each management area will be discussed in section 2, soil test information will be discussed in section 3 and application worksheets will be discussed in section 4.

2.1. Main Campus

Description



The university atmosphere is residential. Most students live in university residence halls or in private apartments and houses within walking distance of the campus. The university grounds and facilities are conveniently arranged, beautifully maintained, and effectively designed to meet the academic, personal, and extracurricular needs and interests of the students.

The area provides abundant recreation, including kayaking, fishing and tubing on the New River; hiking or bicycling on one of the region's dozens of trails; or simply taking in nature nearly anywhere in the area.

The area to the west of Tyler Ave is no longer maintained by the school.

Location

Radford's main campus area is in the triangle formed by Rt. 11 (Lee Hwy./Main St.), Jefferson Street and Tyler Avenue.

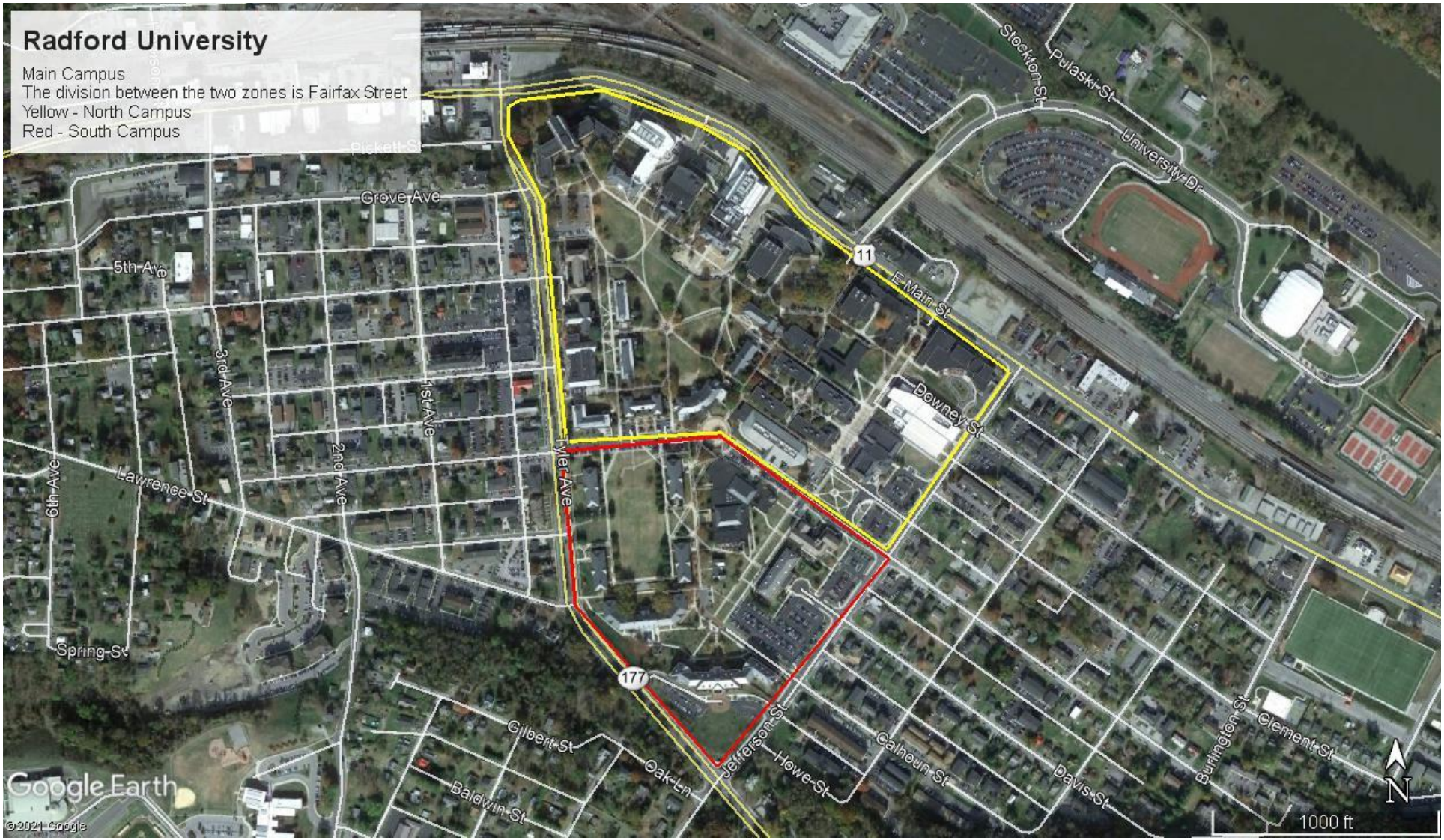
GPS Coordinates: 37.138088, -80.550010

Areas Managed

Two samples were taken from this area, one from the North and South areas of campus. Fairfax Street separates the two areas. They are managed the same and both are cool season grass. The need for two samples was dictated by the size of the area. Soil tests show marginal differences and will be combined into one recommendation. Buildings, roads, and sidewalks were roughly measured using goggle earth and were subtracted from total acreage of 53.6 acres north and 31.6 acres south.

North Campus – Outlined in yellow. About 23 acres cool season turf. The predominate turf species is tall fescue.

South Campus – Outlined in red. About 14 acres cool season turf. The predominate turf species is tall fescue.


Radford University
Main Campus
The division between the two zones is Fairfax Street
Yellow - North Campus
Red - South Campus
Pickett St
Grove Ave
5th Ave
3rd Ave
1st Ave
2nd Ave
6th Ave
Lawrence St
Spring St
Tyler Ave
Stockton St
Pulaski St
University Dr
11
E Main St
Downey St
177
Gilbert St
Oak Ln
Baldwin St
Jefferson St
Howe St
Calhoun St
Davis St
Burlington St
Clement St
Google Earth
©2021 Google
N
1000 ft

2.2. Dedmon Athletic Complex

Description

The Dedmon Athletic Complex is home to all of Radford's NCAA and Intramural Sports. There are 10 sports fields, the Dedmon Center, Cupp Stadium, and multiple support buildings. The Armstrong Building, home of Radford Facilities Management, is also located in this area.

Location

The Dedmon Athletic Complex is located across Main Street from main campus between the New River and Railroad Tracks. It is accessed by crossing the bridge over the railroad on University Drive.

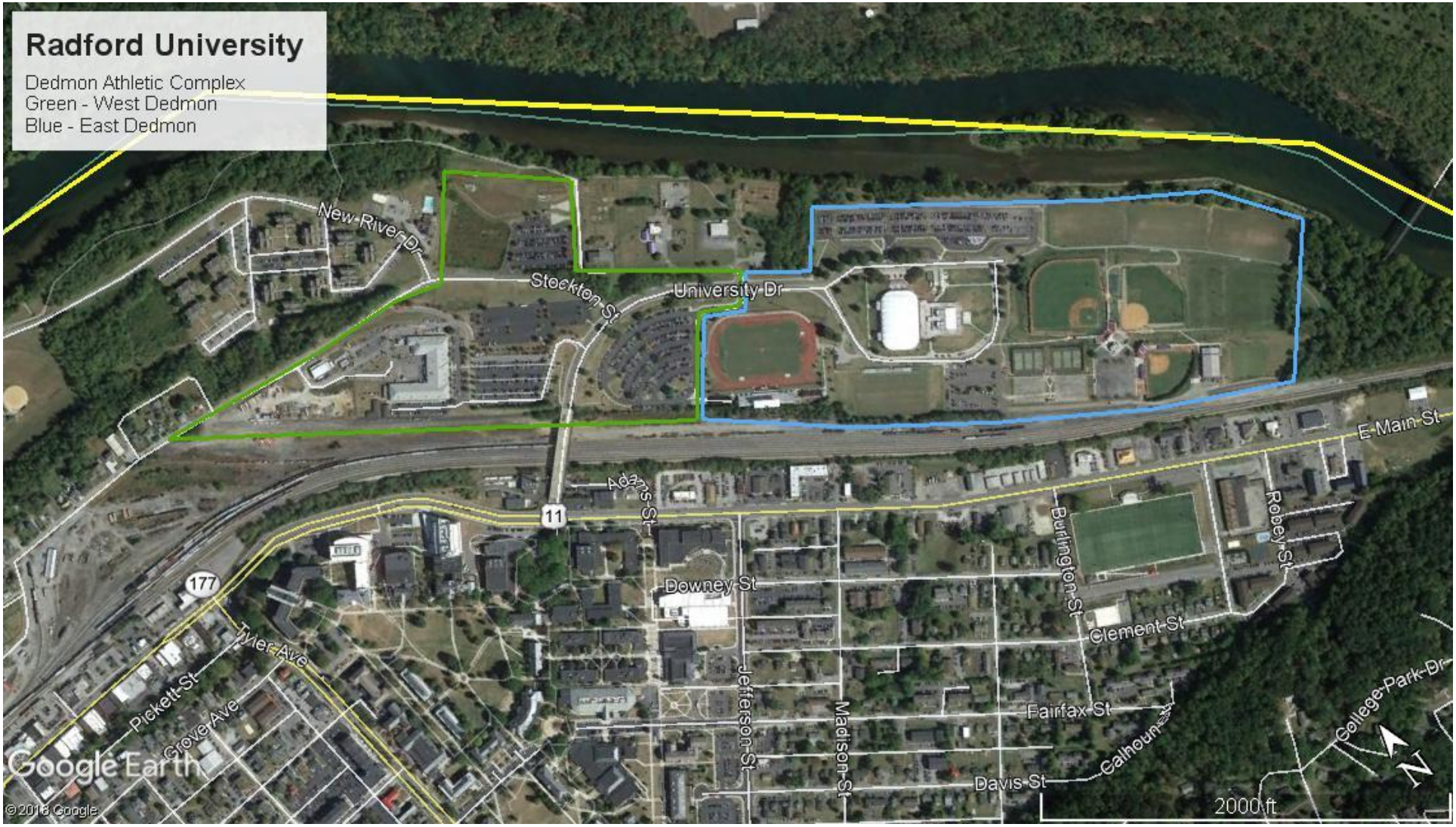
GPS Coordinates: 37.140585, -80.546630

Areas Managed

Two samples were taken from this area, one from around the Dedmon Center to represent the common areas on the eastern side of the complex. Samples were taken around the Armstrong Building to represent the common areas on the western side of the complex. The dividing line follows the western edge of Cupp Stadium. They are managed the same and both are cool season grass. The need for two samples was dictated by the size of the area. Soil test results will be combined into one recommendation. Sports fields, buildings, roads, and sidewalks were roughly measured using goggle earth and were subtracted from total acreage of 40.3 acres west and 63.9 acres east.

West Dedmon – Outlined in green. About 17 acres cool season turf. The predominate turf species is tall fescue.

East Dedmon – Outlined in blue. About 20 acres cool season turf. The predominate turf species is tall fescue.


Radford University
Dedmon Athletic Complex
Green - West Dedmon
Blue - East Dedmon
New River Dr
Stockton St
University Dr
E Main St
Adams St
11
177
Downey St
Burlington St
Robey St
Clement St
Tyler Ave
Pickett St
Grove Ave
Jefferson St
Madison St
Fairfax St
Calhoun St
Davis St
College Park Dr
N
2000 ft
Google Earth
©2018 Google

2.3. Cupp Stadium

Description

Patrick D. Cupp Memorial Stadium was completed in 2003 and quickly became one of the premier soccer and track and field stadiums in the Southeast. The largest soccer/track facility in the Big South Conference, Cupp Stadium has seating for 5,000 spectators. Four large locker rooms, an on-site athletic training room, and a dedicated laundry room highlight the amenities for student-athletes and teams. The soccer surface is a Bermuda blend natural grass field. A state-of-the-art drainage system was recently added to assist in keeping the field in top shape year-round. The track is a synthetic surface divided into eight lanes. The stadium also includes jumping and vaulting pits.

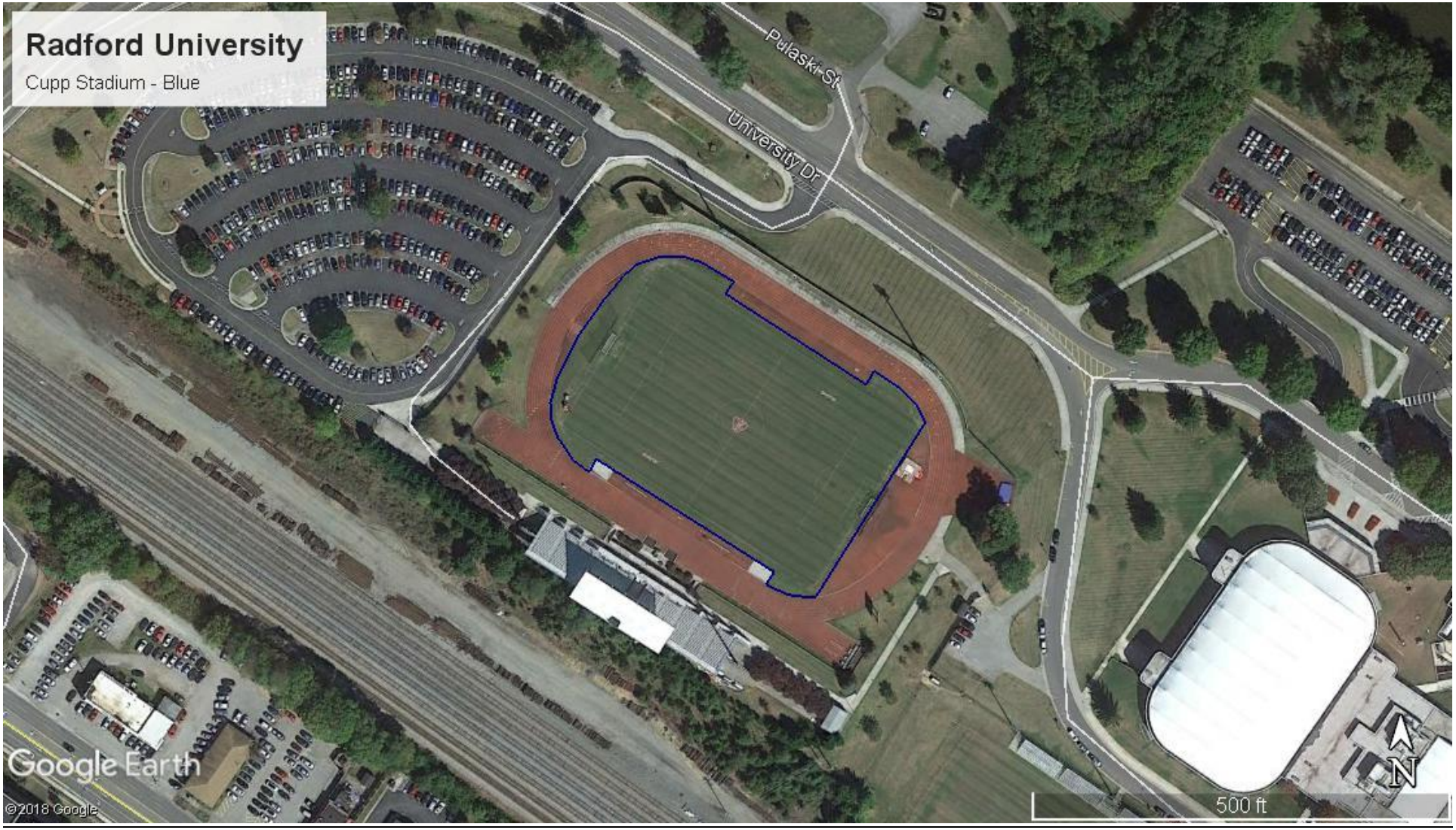
Location

The Dedmon Athletic Complex is located across Main Street from main campus between the New River and Railroad Tracks. It is accessed by crossing the bridge over the railroad on University Drive. Cupp Stadium is first athletic field on the right.

GPS Coordinates: 37.139405, -80.544023

Areas Managed

Cupp Stadium is 2.3 acres of irrigated warm season turf. The soil is sand based with sand channel drainage (Cambridge). Outlined in blue. The predominate turf species is bermudagrass.


Radford University
Cupp Stadium - Blue
Pulaski St
University Dr
Google Earth
©2018 Google
500 ft
N

2.4. Field Hockey

Description

Radford University Field Hockey Field serves as home to the Radford University Field Hockey team. The field itself is natural grass, one of only two NorPac Conference fields to offer a natural playing surface. The fan side of the field offers seating for 1,000 fans, while the opposite side features the team benches, a scorer's table area, a dedicated scoreboard and a video tower. The field also features lights, allowing the team to practice or play after dark. Originially designed as RU's intercollegiate soccer field, the stadium was converted for Field Hockey-only use in 2002.

Location

The Dedmon Athletic Complex is located across Main Street from main campus between the New River and Railroad Tracks. It is accessed by crossing the bridge over the railroad on University Drive. After passing Cupp Stadium bear right between the Cupp Stadium and the Dedmon Center. The field hockey stadium is located to the right behind Dedmon.

GPS Coordinates: 37.137836, -80.542542

Areas Managed

The field is 2 acres of irrigated warm season turf. The soil is native (silt/clay) based with no drainage. Outlined in white. The predominate turf species is bermudagrass.


Radford University
Field Hockey - White
University Dr
E Main St
Google Earth
©2018 Google
500 ft
N

2.5. Softball

Description

The biggest renovation in the facility's history was completed for the start of the 2014 campaign. Located in the northeast corner of the Dedmon Center's outdoor facilities, Radford Softball Stadium includes spacious, up-to-the-date dugouts, chairback stadium seating, and a pressbox. In addition, a state-of-the-art sound system, along with upgrades to the bullpens and batting cages were included. Hosts of three Big South Tournaments and four nationally televised contests on the ESPN networks, RU's facility upgrade allows the program to showcase its talents in a state-of-the-art stadium, while providing a better viewing for spectators and more efficient access for media, television, and radio. Radford opened the stadium on April 5 with a doubleheader sweep against Presbyterian and finished the year 11-3 in its new home. On April 26, the Athletics department held its official grand opening of RU Softball Stadium prior to a doubleheader versus Gardner-Webb

Location

The Dedmon Athletic Complex is located across Main Street from main campus between the New River and Railroad Tracks. It is accessed by crossing the bridge over the railroad on University Drive. After passing Cupp Stadium bear right between Cupp Stadium and the Dedmon Center. Continue behind the Dedmon Center and turn right into parking lot. Follow road to back of parking lot and then continue down drive between tennis courts and railroad. You will reach the parking lot serving the baseball stadium, softball stadium and upper/middle IM fields.

GPS Coordinates: 37.136617, -80.539089

Areas Managed

The softball field is 0.7 acres of irrigated warm season turf. The predominate turf species is bermudagrass. The soil is native (silt/clay) based with no drainage. Outlined in black.


Radford University
Softball - Black
E Main St
11
Google Earth
© 2018 Google
500 ft
N

2.6. Practice Fields

Description

Radford has two regulation size practices fields for field sports. There is also a turf area near the hitting facility that is used for baseball/softball activities.

Location

The Dedmon Athletic Complex is located across Main Street from main campus between the New River and Railroad Tracks. It is accessed by crossing the bridge over the railroad on University Drive. After passing Cupp Stadium continue straight past the Dedmon Center. At end of road bear left into parking lot. Practice fields are located on the lower level and adjacent to the new river. The fields are congruent and located beyond the rugby field, which is closest to the parking lot.

GPS Coordinates: 37.137104, -80.536729

Areas Managed

All three fields were included in one sample. They are 4.6 acres of warm season, irrigated turf. The soil is native (silt/clay) based with no drainage. Outlined in Red. The predominate turf species is bermudagrass


Radford University
Practice - Red
Google Earth
©2018 Google
600 ft
N

2.7. IM Fields

Description

The Department of Student Recreation & Wellness operates several outdoor venues for various programming needsCurrently the department operates 3 natural turf fields (1 softball field and 2 multipurpose fields) located in the Dedmon Athletic complex. There is also a 7 acre artificial field located across the train tracks/Main St.

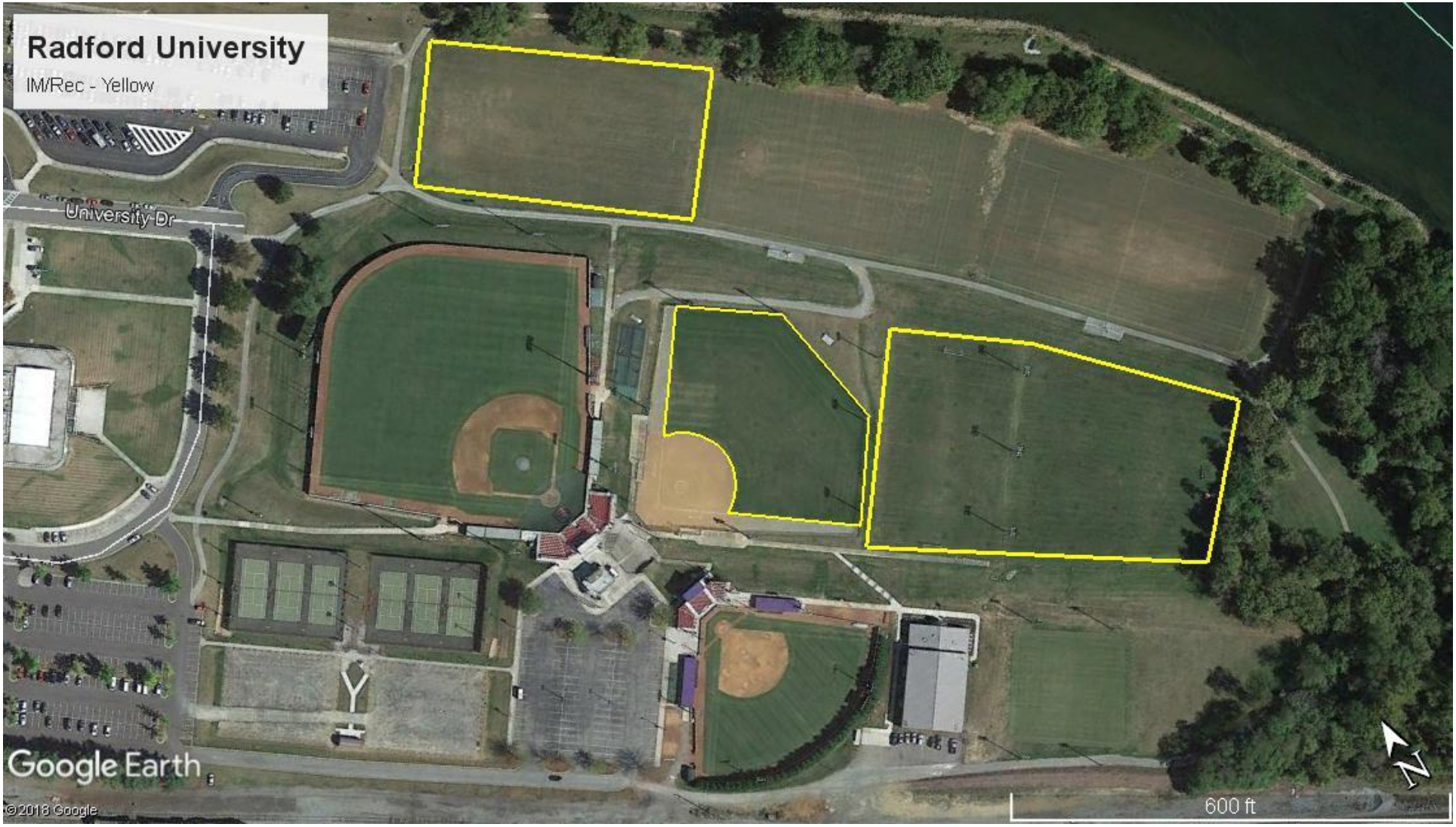
Location

The Dedmon Athletic Complex is located across Main Street from main campus between the New River and Railroad Tracks. It is accessed by crossing the bridge over the railroad on University Drive. After passing Cupp Stadium bear right between Cupp Stadium and the Dedmon Center. Continue behind the Dedmon Center and turn right into parking lot. Follow road to back of parking lot and then continue down drive between tennis courts and railroad. You will reach the parking lot serving the baseball stadium, softball stadium and upper/middle IM fields. Upper fields are located behind the softball field. Mid-level fields (softball and field) are located beside the baseball field. The lower level Rugby field can be accessed via the stairs between the baseball and IM softball field or from the parking lot below the Dedmon Center.

GPS Coordinates: 37.398389, -79.181010

Areas Managed

One sample was taken to represent all three fields. They are 6.5 acres of cool season irrigated turf. The soil is native (silt/clay) based with no drainage. Outlined in yellow. The predominate turf species is tall fescue.


Radford University
IM/Rec - Yellow
University Dr
Google Earth
©2018 Google
600 ft
N

2.8. IM/Rec Sports Common Area

Description

The Department of Student Recreation & Wellness operates several outdoor venues to assist with our various programming needs. Opened Fall 2015 is a new 7 acre, fully lighted, Artificial Turf Field project that will accommodate flag football, soccer fields, and many other sports.

Also located at this site is the Russell Athletics Warehouse.

The turf area around sand volleyball and basketball courts has been added.

Location

These areas are located to the east of main campus on Main Street.

Address:	219 East Main Street Radford, Virginia 24142
GPS Coordinates:	37.134628, -80.539878

Areas Managed

The 3.3 acres of common turf around the artificial athletic field and the warehouse are fertilized. This is all cool season turf. The predominate turf species is tall fescue.


Radford University
IM/Rec Common Area
Fertilized Areas Shown in Red
Field is artificial
Downey St
Wilson St
11
E Main St
Burlington St
Fairfax St
Clement St
Whitehall St
Robey St
Google Earth
©2021 Google
N
600 ft

2.9. Residential Area

Description

915 Tyler Ave is the Presidents Home. The late Victorian/Queen Anne house, named Halwyck, located on Tyler Avenue in Radford, was built in 1892 and predates the founding of Radford University. The two-story brick dwelling was built by Virginia's 43rd governor, John Hoge Tyler (1846-1925), and his wife Susan Montgomery Hammet Tyler (1845-1927), who were influential in the early development of the City of Radford when it emerged as a railway hub and industrial center in Southwest Virginia.

905 Tyler Ave is no longer owned by the college.

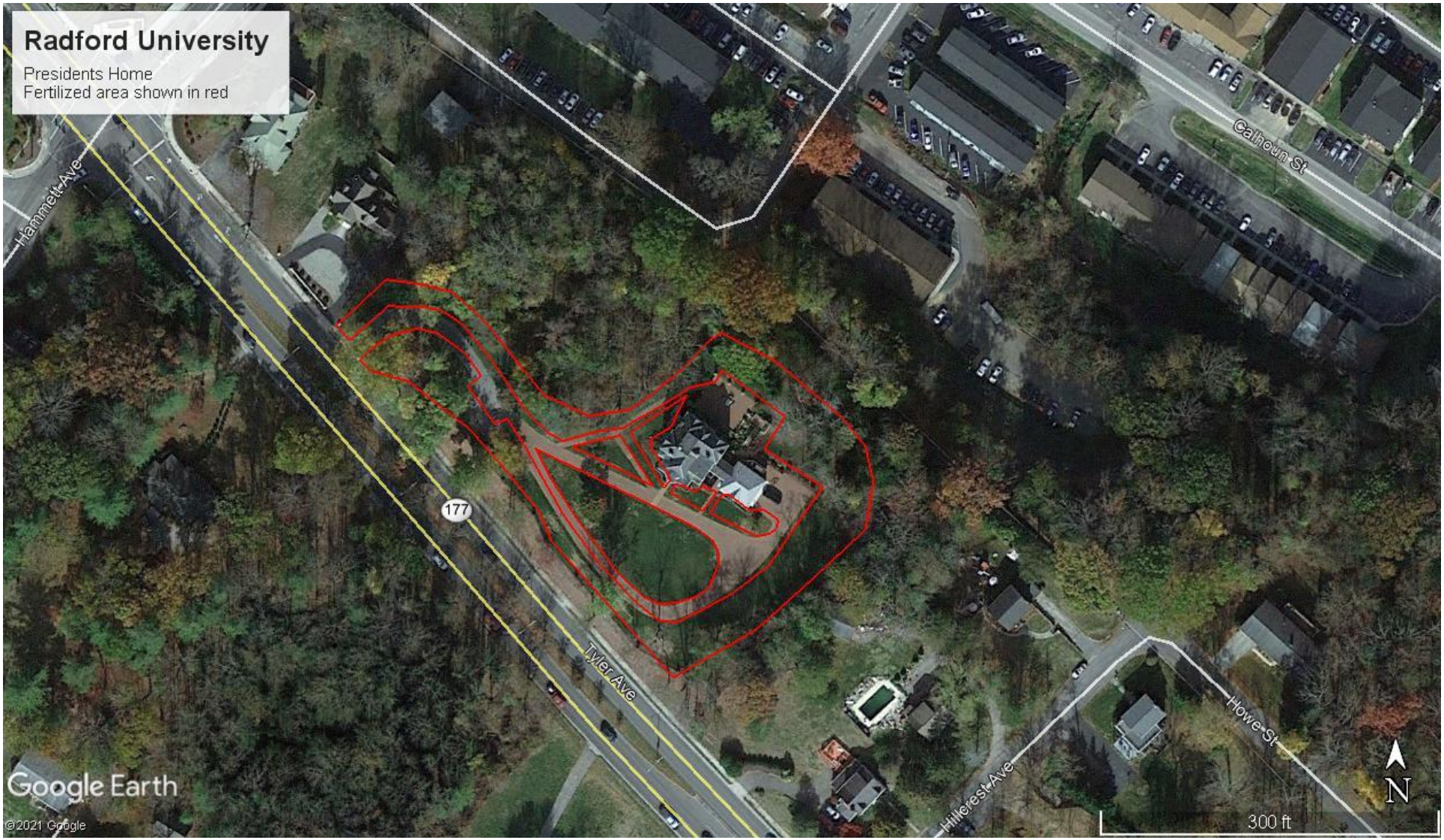
Location

The home is located just before you reach the Radford campus near the intersection of Tyler Ave. and Jefferson St.

Address:	915 Tyler Ave., Radford, VA 24142
GPS Coordinates:	37.132045, -80.549040

Areas Managed

The 1.1 acres of cool season lawns around both homes are fertilized. The predominate turf species is tall fescue.


Radford University
Presidents Home
Fertilized area shown in red
Hammett Ave
Calhoun St
177
Tyler Ave
Hillcrest Ave
Howe St
Google Earth
©2021 Google
300 ft
N

2.10. Baseball

The Baseball field has been converted to artificial turf and has been removed from this plan.

3. Soil Test Summaries

Discussion of soil test results and allowable nutrient inputs. Specific applications details can be found in Nutrient Application Worksheet.

Soil tests are rated in terms of Very Low to Very High. To comply with Virginia Nutrient Management Standards and Criteria, Revised July 2014, no phosphorus may be applied if a soil test rates that element Very High. In economic terms, nutrients are not necessarily needed if they test above a medium rating; plant response is not guaranteed if soils already test above medium and therefore money can be saved by using a nitrogen only fertilizer. (See plant response chart page 69)

A. There are three different types of turf in this plan. Irrigated cool season sports turf, cool season general turf and irrigated warm season sports turf. Each location has a different nitrogen need and application schedule and will have separate application worksheets and record sheets.

B. Individual soil samples were provided for most locations. For those areas which were too large for 1 sample, "Limiting Results" will be used. Limiting results are the value which needs the least input. These results will be highlighted in the applicable tables.

C. Application worksheets for each location and type of grass can be found in the "Application Worksheet" section.

D. For warm and cool season sports turf, application schedule and rates are based on DCR guidelines and must be followed as written. Large applications outside of these windows or more than these rates are not permitted.

E. For cool season sports turf, soluble nitrogen rates of 0.25 #/M N or less may be applied as a part of a pesticide or minor element application and can be applied any time the turf is actively growing within the frost dates but must be considered part of the total annual nitrogen.

F. All fertilizers suggested are granular, spray applications may be substituted. Labels for suggested fertilizers are located at the end of the document. Fertilizer analyses may be changed, but rates and slow release content must adhere to guidelines on the following descriptions for each type of turf.

G. Plan will be written for maximum nitrogen input. The grounds manager will decide if all applications are needed by monitoring turf conditions.

H. Lime is needed in some areas, see lime application chart for specifics.

Soil samples were taken by Robert Habel 0n 3/9/2021. Soil testing was conducted by Waypoint Analytical on 3/12/2021.

Soil Test Summary	
Customer Name:	Radford University
Testing Lab:	Waypoint Analytical
Analysis Date:	3/12/2021
Sample Date:	3/9/2021
Planner Name	Five Oaks Agronomy Consulting
Certification Number	654

Managed Area ID	Soil Test ID#	Soil pH	Buffer pH	Lab P_2O_5 (ppm)	VT P (ppm)	VT (H/M/L)	Lab K_2O (ppm)	VT K (ppm)	VT (H/M/L)
Campus - North	RU 01	7.20		32	11.4	M	161	114.3	H
Campus – South	RU 02	7.10		35	12.8	M	147	104.4	H-
Dedmon – West	RU 03	7.00		26	8.6	M-	178	126.4	H-
Dedmon – East	RU 04	6.60		17	4.5	L	95	67.5	M
Cupp Stadium	RU 05	5.60	6.86	50	19.6	H-	52	36.9	M
Field Hockey	RU 06	5.60	6.81	66	27.0	H-	121	85.9	M+
Softball	RU 07	5.60	6.84	35	12.8	M	91	64.6	M
Practice Fields – Upper	RU 08	7.00		35	12.8	M	71	50.4	M-
IM Middle, Softball,	RU 09	6.50		26	8.6	M-	125	88.8	H-
IM/Rec Sports Complex	RU 10	6.80		22	6.8	M-	131	93.0	H-
Residential Area	RU 11	7.00		31	10.9	M-	137	97.3	H-

3.1. Main Campus

All areas of general turf may receive 3.5 #/M nitrogen per year. If using 100% water-soluble nitrogen 0.7 #/M may be applied every 30 days. If using slow release materials, 0.9 #/M may be used every 30 days. Do not exceed stated per year total. These applications may be made at any time within the frost-free dates if the turf is actively growing. A program weighted towards fall applications is recommended.

Soil test Limiting Results were medium (M) levels of phosphorus and high (H-) levels of potassium. 1.5 #/M of phosphorus will be allowed. 1 #/M potassium is called for, but more can be applied as potassium does not pose a water quality risk.

Lime is not needed at this time.

Customer Name:		Radford University							
Testing Lab:		Waypoint Analytical							
Sample Date:		2/8/2018							
Testing Date:		2/1/2018							
Managed Area ID	Soil Test ID	Soil pH	Buffer pH	Lab P (ppm)	VT P (ppm)	VT (H/M/L)	Lab K (ppm)	VT K (ppm)	VT (H/M/L)
Campus - North	RU 01	7.20		32	11.4	M	161	114.3	H
Campus – South	RU 02	7.10		35	12.8	M	147	104.4	H-
Limiting Results					12.8	M		114.3	H-
DCR Allowed Input (#/M)		**Lime:**	**0**		**P:**	**1.5**		**K:**	**1**

3.2. Dedmon Athletic Complex

All areas of general turf may receive 3.5 #/M nitrogen per year. If using 100% water-soluble nitrogen 0.7 #/M may be applied every 30 days. If using slow release materials, 0.9 #/M may be used every 30 days. Do not exceed stated per year total. These applications may be made at any time within the frost-free dates if the turf is actively growing. A program weighted towards fall applications is recommended.

Soil test Limiting Results were medium (M-) levels of phosphorus and high (H-) levels of potassium. 2 #/M of phosphorus will be allowed. 1 #/M potassium is called for, but more can be applied as potassium does not pose a water quality risk.

Customer Name:		Radford University							
Testing Lab:		Waypoint Analytical							
Sample Date:		2/8/2018							
Testing Date:		2/1/2018							
Managed Area ID	Soil Test ID	Soil pH	Buffer pH	Lab P (ppm)	VT P (ppm)	VT (H/M/L)	Lab K (ppm)	VT K (ppm)	VT (H/M/L)
Dedmon – West	RU 03	7.00		26	8.6	M-	178	126.4	H-
Dedmon – East	RU 04	6.60		17	4.5	L	95	67.5	M
Limiting Results					8.6	M-		126.4	H-
DCR Allowed Input (#/M)		**Lime:**	**0**		**P:**	**2**		**K:**	**1**

3.3. Cupp Stadium

5 #/M nitrogen allowed per year on this irrigated warm season field with an additional 1 #/M allowed for overseeding.

- Water Soluble Nitrogen must be applied as two applications not to exceed 0.35 #/M each with a minimum of 15 days between applications. Alternatively, using a material that contains at least 15% slowly available nitrogen sources, split applications of 0.5 #/M may be applied with a minimum of 15 days between applications.
- For overseeded warm season turf, if using a minimum of 15% slow release N, a max of 1#/M N may be used. Applications of 0.5 #/M may be applied in spring and fall. If using less than 15% slow release N, a max of 0.7 #/M N may be used. Applications of 0.35 #/M may be applied in spring and fall.
- Do not exceed stated per year total.
- These applications must be made within this time frame.

Soil test shows high (H-) levels of phosphorus and medium (M) levels of potassium. 1 #/M of phosphorus is allowed. 1.5 #/M potassium is called for, but more can be applied as potassium does not pose a water quality risk.

The buffer pH is 6.86. According to the soil test report recommendations, 23 #/M of dolomitic lime is needed. Attempt to apply at aeration.

Customer Name:		Radford University							
Testing Lab:		Waypoint Analytical							
Sample Date:		2/8/2018							
Testing Date:		2/1/2018							
Managed Area ID	Soil Test ID	Soil pH	Buffer pH	Lab P (ppm)	VT P (ppm)	VT (H/M/L)	Lab K (ppm)	VT K (ppm)	VT (H/M/L)
Cupp Stadium	RU 05	5.60	6.86	50	19.6	H-	52	36.9	M
DCR Allowed Input (#/M)		**Lime:**	**0.5 T/A**		**P:**	**1**		**K:**	**1.5**

3.4. Field Hockey

5 #/M nitrogen allowed per year on this irrigated warm season field with an additional 1 #/M allowed for overseeding.

- Applications of nitrogen occurring outside of the summer months (Sep-May) must be split. Water-soluble nitrogen or products with less than 15% slowly available nitrogen must be applied with a per-application maximum of 0.35 #/M and a minimum of 15 days between applications. Products with 15% or greater slowly available nitrogen may be applied with a per-application maximum of 0.5 #/M and a minimum of 15 days between applications.
- Applications made during the summer months (Jun-Aug) have higher allowable application rates. Applications of water soluble nitrogen or products with less than 15% slowly available nitrogen must be applied with a per-application max of 0.7 #/M and a minimum of 30 days between applications. Products with 15% or greater slowly available nitrogen may be applied with a per-application max of 1 #/M.
- Do not exceed stated per year total.
- These applications must be made within this time frame.

Soil test shows high (H-) levels of phosphorus and medium (M+) levels of potassium. 1 #/M of phosphorus is allowed. 1 #/M potassium is called for, but more can be applied as potassium does not pose a water quality risk.

The buffer pH is 6.81. According to the soil test report recommendations, 46 #/M of dolomitic lime is needed. Attempt to apply at aeration.

Customer Name:		Radford University							
Testing Lab:		Waypoint Analytical							
Sample Date:		2/8/2018							
Testing Date:		2/1/2018							
Managed Area ID	Soil Test ID	Soil pH	Buffer pH	Lab P (ppm)	VT P (ppm)	VT (H/M/L)	Lab K (ppm)	VT K (ppm)	VT (H/M/L)
Field Hockey	RU 06	5.60	6.81	66	27.0	H-	121	85.9	M+
DCR Allowed Input (#/M)		**Lime:**	**1 T/A**		**P:**	**1**		**K:**	**1**

3.5. Softball

5 #/M nitrogen allowed per year on this irrigated warm season field with an additional 1 #/M allowed for overseeding.

- Applications of nitrogen occurring outside of the summer months (Sep-May) must be split. Water-soluble nitrogen or products with less than 15% slowly available nitrogen must be applied with a per-application maximum of 0.35 #/M and a minimum of 15 days between applications. Products with 15% or greater slowly available nitrogen may be applied with a per-application maximum of 0.5 #/M and a minimum of 15 days between applications.
- Applications made during the summer months (Jun-Aug) have higher allowable application rates. Applications of water soluble nitrogen or products with less than 15% slowly available nitrogen must be applied with a per-application max of 0.7 #/M and a minimum of 30 days between applications. Products with 15% or greater slowly available nitrogen may be applied with a per-application max of 1 #/M.
- Do not exceed stated per year total.
- These applications must be made within this time frame.

Soil test shows medium (M) levels of phosphorus and medium (M) levels of potassium. 1.5 #/M of phosphorus is allowed. 1.5 #/M potassium is called for, but more can be applied as potassium does not pose a water quality risk.

The buffer pH is 6.84. According to the soil test report recommendations, 46 #/M of dolomitic lime is needed. Attempt to apply at aeration.

Customer Name:		Radford University							
Testing Lab:		Waypoint Analytical							
Sample Date:		2/8/2018							
Testing Date:		2/1/2018							
Managed Area ID	Soil Test ID	Soil pH	Buffer pH	Lab P (ppm)	VT P (ppm)	VT (H/M/L)	Lab K (ppm)	VT K (ppm)	VT (H/M/L)
Softball	RU 07	5.60	6.84	35	12.8	M	91	64.6	M
DCR Allowed Input (#/M)		**Lime:**	**1 T/A**		**P:**	**1.5**		**K:**	**1.5**

3.6. Practice Fields

5 #/M nitrogen allowed per year on this irrigated warm season field with an additional 1 #/M allowed for overseeding.

- Applications of nitrogen occurring outside of the summer months (Sep-May) must be split. Water-soluble nitrogen or products with less than 15% slowly available nitrogen must be applied with a per-application maximum of 0.35 #/M and a minimum of 15 days between applications. Products with 15% or greater slowly available nitrogen may be applied with a per-application maximum of 0.5 #/M and a minimum of 15 days between applications.
- Applications made during the summer months (Jun-Aug) have higher allowable application rates. Applications of water soluble nitrogen or products with less than 15% slowly available nitrogen must be applied with a per-application max of 0.7 #/M and a minimum of 30 days between applications. Products with 15% or greater slowly available nitrogen may be applied with a per-application max of 1 #/M.
- Do not exceed stated per year total.
- These applications must be made within this time frame.

Soil test shows medium (M) levels of phosphorus and medium (M-) levels of potassium. 1.5 #/M of phosphorus is allowed. 2 #/M potassium is called for, but more can be applied as potassium does not pose a water quality risk.

Lime is not needed at this time.

Customer Name:		Radford University							
Testing Lab:		Waypoint Analytical							
Sample Date:		2/8/2018							
Testing Date:		2/1/2018							
Managed Area ID	Soil Test ID	Soil pH	Buffer pH	Lab P (ppm)	VT P (ppm)	VT (H/M/L)	Lab K (ppm)	VT K (ppm)	VT (H/M/L)
Practice Fields – Upper and Lower	RU 08	7.00		35	12.8	M	71	50.4	M-
DCR Allowed Input (#/M)		**Lime:**	**0**		**P:**	**1.5**		**K:**	**2**

3.7. IM Fields

4.2 #/M nitrogen allowed per year on this irrigated cool season field. For September through November applications, if using 100% water-soluble nitrogen 0.7 #/M may be applied every 30 days. If using slow release materials, 0.9 #/M may be used every 30 days. For applications made from April to August, the maximum application rat is 0.5 #/M every 30 days. Do not exceed stated per year total. These applications must be made within this time frame, see footnote D on page 34 for exceptions.

Soil test results were medium (M-) levels of phosphorus and high (H-) levels of potassium. 2 #/M of phosphorus is allowed. 1 #/M potassium is called for, but more can be applied as potassium does not pose a water quality risk.

Lime is not needed at this time.

Customer Name:		Radford University							
Testing Lab:		Waypoint Analytical							
Sample Date:		2/8/2018							
Testing Date:		2/1/2018							
Managed Area ID	Soil Test ID	Soil pH	Buffer pH	Lab P (ppm)	VT P (ppm)	VT (H/M/L)	Lab K (ppm)	VT K (ppm)	VT (H/M/L)
IM Middle, Softball, Rugby	RU 09	6.50		26	8.6	M-	125	88.8	H-
DCR Allowed Input (#/M)		**Lime:**	**0**		**P:**	**2**		**K:**	**1**

3.8. IM/Rec Sports Common Area

All areas of general turf may receive 3.5 #/M nitrogen per year. If using 100% water-soluble nitrogen 0.7 #/M may be applied every 30 days. If using slow release materials, 0.9 #/M may be used every 30 days. Do not exceed stated per year total. These applications may be made at any time within the frost-free dates if the turf is actively growing. A program weighted towards fall applications is recommended.

Soil test results show medium (M-) levels of phosphorus and high (H-) levels of potassium. 2 #/M of phosphorus is allowed. 1 #/M potassium is called for, but more can be applied as potassium does not pose a water quality risk.

Lime is not needed at this time.

Customer Name:		Radford University							
Testing Lab:		Waypoint Analytical							
Sample Date:		2/8/2018							
Testing Date:		2/1/2018							
Managed Area ID	Soil Test ID	Soil pH	Buffer pH	Lab P (ppm)	VT P (ppm)	VT (H/M/L)	Lab K (ppm)	VT K (ppm)	VT (H/M/L)
IM/Rec Sports Common Area	RU 10	6.80		22	6.8	M-	131	93.0	H-
DCR Allowed Input (#/M)		**Lime:**	**0**		**P:**	**2**		**K:**	**1**

3.9. Residential

All areas of general turf may receive 3.5 #/M nitrogen per year. If using 100% water-soluble nitrogen 0.7 #/M may be applied every 30 days. If using slow release materials, 0.9 #/M may be used every 30 days. Do not exceed stated per year total. These applications may be made at any time within the frost-free dates if the turf is actively growing. A program weighted towards fall applications is recommended.

Soil test results show medium (M-) levels of phosphorus and high (H-) levels of potassium. 2 #/M of phosphorus is allowed. 1 #/M potassium is called for, but more can be applied as potassium does not pose a water quality risk. Lime is not needed at this time.

Customer Name:		Radford University							
Testing Lab:		Waypoint Analytical							
Sample Date:		2/8/2018							
Testing Date:		2/1/2018							
Managed Area ID	Soil Test ID	Soil pH	Buffer pH	Lab P (ppm)	VT P (ppm)	VT (H/M/L)	Lab K (ppm)	VT K (ppm)	VT (H/M/L)
Residential Area	RU 11	7.00		31	10.9	M-	137	97.3	H-
DCR Allowed Input (#/M)		**Lime:**	**0**		**P:**	**2**		**K:**	**1**

4. Nutrient Application Worksheets

The following worksheets detail specific fertilizer applications using the previously discussed soil test information. All nutrient input level recommendations come from the Department of Conservation and Recreation's Nutrient Management Standards and Criteria, this document is part of the Code of Virginia and thus is law for those required to have a Nutrient Management Plan. While applications do not have to be followed specifically, it is important to note that per month nitrogen levels shall not be exceeded and per year phosphorus levels shall not be exceeded. In some cases, potassium input may exceed recommended levels, as it does not have the same detrimental effects on the health of Virginia's waters as nitrogen and phosphorus. Potassium is considered the plant nutrient most responsible for quality. It helps plants respond to stresses like drought, extreme heat/cold, and insect/disease pressure. The plants increased ability to respond to stress in a positive manner can help reduce the need for increased N and P fertility and reseeding caused by stress.

- Specific fertilizers have been recommended. Fertilizer analyses are subject to change dependent on availability, suppliers chosen, etc. It is your responsibility to choose fertilizers and calculate appropriate rates that follow discussed regulations. Do not exceed stated monthly Total N or yearly total P. Please contact your planner if you need help adjusting a fertilizer application to meet the requirements of this plan. A spreadsheet to help calculate rates is available on provided flash drive.

- Making fertilizer applications without calibrating your equipment will lead to inaccurate applications. Application rates (# product/M) and amount of product needed per application (lb/app) are included in spreadsheet.

- Please stay within dates indicated on spreadsheets.

- Class B bio-solids and animal manures cannot be used without revising this plan to reflect the appropriate setbacks and environmental hazards. Class A bio-solids like Milorganite can be used without problem.

- Potassium applications have been exceeded. Potassium helps protect the plant from stress and poses no threat to water quality.

- Fertilizer labels of products chosen are located at end of document.

- All applications are shown in #/M.

4.1. Main Campus

NUTRIENT APPLICATION WORK SHEET											
Name:	**Radford University**			**Management Area (acres):**	**Main Campus - North and South Zones**						
Prepared:	**6/1/2021**			**Area:**	**37**		**Turf Type:**	**Cool Season General Turf**			
Expires:	**6/1/2024**										
Total Yearly Nutrient Needs	**AppliCation Month/Day**	**Analysis** N - P - K	**Interval (days)**	**Fertilizer Description**	**Rate/M**	**lbs/app**	**% Slow Release N**	**Total/M** N - P - K	**Lime** lbs/M	**Gypsum** lbs/M	**lbs/app lime/gyp**
Nitrogen	**No applications before March 5**										
3.5	March	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	5.31	8558	55	0.85 - 0.16 - 0.42			
Phosphorus											
1.5	May	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	5.31	8558	55	0.85 - 0.16 - 0.42			
Potassium											
1	August	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	5.63	9074	55	0.90 - 0.17 - 0.45			
	November	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	5.63	9074	55	0.90 - 0.17 - 0.45			
	No applications after December 4										
	Lime										
	See lime application sheet										
						Total used:		3.50 - 0.66 - 1.74			
				Do not exceed yearly maximum allowed by Regulation (Except for K):				**3.5 - 1.5 - 1**			

Notes:

- Tested M in Phosphorus and H- Potassium.
- Application rates are based on use of at least 15% slow release fertilizer. 0.9 #/M N allowed if using at least 15% slow release nitrogen. If using less than 15% only 0.7 #/M nitrogen allowed.

4.2. Dedmon Athletic Complex

NUTRIENT APPLICATION WORK SHEET												
Name:	**Radford University**			**Management Area (acres):**	**Dedmon Athletic Complex - East and West Zones**							
Prepared:	**6/1/2021**			**Area:**	**37**		**Turf Type:**	**Cool Season General Turf**				
Expires:	**6/1/2024**											
Total Yearly Nutrient Needs	**AppliCation Month/Day**	**Analysis N - P - K**	**Interval (days)**	**Fertilizer Description**	**Rate/M**	**lbs/app**	**% Slow Release N**	**Total/M N - P - K**			**Lime lbs/M**	**Gypsum lbs/M**	**lbs/app lime/gyp**
Nitrogen	**No applications before March 5**												
3.5	March	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	5.31	8558	55	0.85 - 0.16 - 0.42					
Phosphorus													
2	May	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	5.31	8558	55	0.85 - 0.16 - 0.42					
Potassium													
1	August	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	5.63	9074	55	0.90 - 0.17 - 0.45					
	November	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	5.63	9074	55	0.90 - 0.17 - 0.45					
	No applications after December 4												
	Lime												
	See lime application sheet												
							Total used:	3.50 - 0.66 - 1.74					
				Do not exceed yearly maximum allowed by Regulation (Except for K):				**3.5 - 2 - 1**					

Notes:

- Tested M- in Phosphorus and H- Potassium.
- Application rates are based on use of at least 15% slow release fertilizer. 0.9 #/M N allowed if using at least 15% slow release nitrogen. If using less than 15% only 0.7 #/M nitrogen allowed.

4.3. Cupp Stadium

NUTRIENT APPLICATION WORK SHEET											
Name:	**Radford University**			**Management Area:**	**Cupp Stadium**						
Prepared:	**6/1/2021**			**Area:**	**2.3**		**Turf Type:**	**Warm Season Irrigated Sports Turf**			
Expires:	**6/1/2024**										
Total Yearly Nutrient Needs	**Application Month/Day**	**Analysis N - P - K**	**Interval (days)**	**Fertilizer Description**	**Rate/M**	**lbs/app**	**% Slow Release N**	**Total/M N - P - K**	**Lime**	**Gypsum**	**lbs/app lime/gyp**
									lbs/M		
Nitrogen	**No applications before April 16 on warm season turf. If turf is overseeded, no applications before March 5.**										
5	March	32 - 0 - 7	30	Southern Lawn 32-0-7 32% XRT	1.56	156	32	0.50 - 0.00 - 0.11			
Phosphorus											
1	After April 16	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	3.13	314	55	0.50 - 0.09 - 0.25			
Potassium											
1.5	May	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	3.13	314	55	0.50 - 0.09 - 0.25			
	June	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	6.25	626	55	1.00 - 0.19 - 0.50			
	July	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	6.25	626	55	1.00 - 0.19 - 0.50			
	August	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	6.25	626	55	1.00 - 0.19 - 0.50			
	Sept 1 - Sept 15	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	6.25	0	55	1.00 - 0.19 - 0.50			
	Oct-Nov	32 - 0 - 7	30	Southern Lawn 32-0-7 32% XRT	1.56	156	32	0.50 - 0.00 - 0.11			
	No applications after September 23 on warm season turf. If turf is overseeded, no applications after December 4.										
	Lime										
	Fall 2021 - 1 Application of 0.5 T/A Dolmitic Limestone								23		2,304
Overseeding	Make these applications only if turf has been overseeded.										
Add 1 #/M N						**Total used:**		6.00 - 0.94 - 2.72			
	Do not exceed yearly maximum allowed by Regulation (Except for K):							**5 - 1 - 1.5**			

Notes:

- Tested H- in Phosphorus and M Potassium.
- Applications of nitrogen occurring outside of the summer months (Sep-May) must be split. Water-soluble nitrogen or products with less than 15% slowly available nitrogen must be applied with a per-application maximum of 0.35 #/M and a minimum of 15 days between

applications. Products with 15% or greater slowly available nitrogen may be applied with a per-application maximum of 0.5 #/M and a minimum of 15 days between applications.

- Applications made during the summer months (Jun-Aug) have higher allowable application rates. Applications of water soluble nitrogen or products with less than 15% slowly available nitrogen must be applied with a per-application max of 0.7 #/M and a minimum of 30 days between applications. Products with 15% or greater slowly available nitrogen may be applied with a per-application max of 1 #/M.
- For overseeded warm season turf, if using a minimum of 15% slow release N, a max of 1#/M N may be used. Applications of 0.5 #/M may be applied in spring and fall. If using less than 15% slow release N, a max of 0.7 #/M N may be used. Applications of 0.35 #/M may be applied in spring and fall.

4.4. Field Hockey

NUTRIENT APPLICATION WORK SHEET											
Name:	**Radford University**			**Management Area:**	**Field Hockey**						
Prepared:	**6/1/2021**			**Area:**	**2**		**Turf Type:**		**Warm Season Irrigated Sports Turf**		
Expires:	**6/1/2024**										
Total Yearly Nutrient Needs	**Application Month/Day**	**Analysis N - P - K**	**Interval (days)**	**Fertilizer Description**	**Rate/M**	**lbs/app**	**% Slow Release N**	**Total/M N - P - K**	**Lime**	**Gypsum**	**lbs/app lime/gyp**
									lbs/M		
Nitrogen	**No applications before April 16 on warm season turf. If turf is overseeded, no applications before March 5.**										
5	March	32 - 0 - 7	30	Southern Lawn 32-0-7 32% XRT	1.56	136	32	0.50 - 0.00 - 0.11			
Phosphorus											
1	After April 16	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	3.13	273	55	0.50 - 0.09 - 0.25			
Potassium											
1	May	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	3.13	273	55	0.50 - 0.09 - 0.25			
	June	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	6.25	545	55	1.00 - 0.19 - 0.50			
	July	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	6.25	545	55	1.00 - 0.19 - 0.50			
	August	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	6.25	545	55	1.00 - 0.19 - 0.50			
	Sept 1 - Sept 15	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	6.25	0	55	1.00 - 0.19 - 0.50			
	Oct-Nov	32 - 0 - 7	30	Southern Lawn 32-0-7 32% XRT	1.56	136	32	0.50 - 0.00 - 0.11			
	No applications after September 23 on warm season turf. If turf is overseeded, no applications after December 4.										
	Lime										
	Fall 2021 - 1 Application of 1 T/A Dolmitic Limestone								46		4,008
Overseeding	Make these applications only if turf has been overseeded.										
Add 1 #/M N						**Total used:**		6.00 - 0.94 - 2.72			
	Do not exceed yearly maximum allowed by Regulation (Except for K):							**5 - 1 - 1**			

Notes:

- Tested H- in Phosphorus and M+ Potassium.
- Applications of nitrogen occurring outside of the summer months (Sep-May) must be split. Water-soluble nitrogen or products with less than 15% slowly available nitrogen must be applied with a per-application maximum of 0.35 #/M and a minimum of 15 days between

applications. Products with 15% or greater slowly available nitrogen may be applied with a per-application maximum of 0.5 #/M and a minimum of 15 days between applications.

- Applications made during the summer months (Jun-Aug) have higher allowable application rates. Applications of water soluble nitrogen or products with less than 15% slowly available nitrogen must be applied with a per-application max of 0.7 #/M and a minimum of 30 days between applications. Products with 15% or greater slowly available nitrogen may be applied with a per-application max of 1 #/M.
- For overseeded warm season turf, if using a minimum of 15% slow release N, a max of 1#/M N may be used. Applications of 0.5 #/M may be applied in spring and fall. If using less than 15% slow release N, a max of 0.7 #/M N may be used. Applications of 0.35 #/M may be applied in spring and fall.

4.5. Softball

NUTRIENT APPLICATION WORK SHEET											
Name:	**Radford University**			**Management Area:**	**Softball**						
Prepared:	**6/1/2021**			**Area:**	**0.7**		**Turf Type:**		**Warm Season Irrigated Sports Turf**		
Expires:	**6/1/2024**										
Total Yearly Nutrient Needs	**Application Month/Day**	**Analysis N - P - K**	**Interval (days)**	**Fertilizer Description**	**Rate/M**	**lbs/app**	**% Slow Release N**	**Total/M N - P - K**	**Lime**	**Gypsum**	**lbs/app lime/gyp**
									lbs/M		
Nitrogen	**No applications before April 16 on warm season turf. If turf is overseeded, no applications before March 5.**										
5	March	32 - 0 - 7	30	Southern Lawn 32-0-7 32% XRT	1.56	48	32	0.50 - 0.00 - 0.11			
Phosphorus											
1.5	After April 16	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	3.13	95	55	0.50 - 0.09 - 0.25			
Potassium											
1.5	May	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	3.13	95	55	0.50 - 0.09 - 0.25			
	June	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	6.25	191	55	1.00 - 0.19 - 0.50			
	July	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	6.25	191	55	1.00 - 0.19 - 0.50			
	August	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	6.25	191	55	1.00 - 0.19 - 0.50			
	Sept 1 - Sept 15	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	6.25	0	55	1.00 - 0.19 - 0.50			
	Oct-Nov	32 - 0 - 7	30	Southern Lawn 32-0-7 32% XRT	1.56	48	32	0.50 - 0.00 - 0.11			
	No applications after September 23 on warm season turf. If turf is overseeded, no applications after December 4.										
	Lime										
	Fall 2021 - 1 Application of 1 T/A Dolmitic Limestone								46		1,403
Overseeding	Make these applications only if turf has been overseeded.										
Add 1 #/M N						**Total used:**		6.00 - 0.94 - 2.72			
	Do not exceed yearly maximum allowed by Regulation (Except for K):							**5 - 1.5 - 1.5**			

Notes:

- Tested M in Phosphorus and M Potassium.
- Applications of nitrogen occurring outside of the summer months (Sep-May) must be split. Water-soluble nitrogen or products with less than 15% slowly available nitrogen must be applied with a per-application maximum of 0.35 #/M and a minimum of 15 days between

applications. Products with 15% or greater slowly available nitrogen may be applied with a per-application maximum of 0.5 #/M and a minimum of 15 days between applications.

- Applications made during the summer months (Jun-Aug) have higher allowable application rates. Applications of water soluble nitrogen or products with less than 15% slowly available nitrogen must be applied with a per-application max of 0.7 #/M and a minimum of 30 days between applications. Products with 15% or greater slowly available nitrogen may be applied with a per-application max of 1 #/M.
- For overseeded warm season turf, if using a minimum of 15% slow release N, a max of 1#/M N may be used. Applications of 0.5 #/M may be applied in spring and fall. If using less than 15% slow release N, a max of 0.7 #/M N may be used. Applications of 0.35 #/M may be applied in spring and fall.

4.6. Practice Fields

NUTRIENT APPLICATION WORK SHEET											
Name:	**Radford University**			**Management Area:**	**Practice Fields**						
Prepared:	**6/1/2021**			**Area:**	**4.6**		**Turf Type:**		**Warm Season Irrigated Sports Turf**		
Expires:	**6/1/2024**										
Total Yearly Nutrient Needs	**Application Month/Day**	**Analysis N - P - K**	**Interval (days)**	**Fertilizer Description**	**Rate/M**	**lbs/app**	**% Slow Release N**	**Total/M N - P - K**	**Lime lbs/M**	**Gypsum lbs/M**	**lbs/app lime/gyp**
Nitrogen	**No applications before April 16 on warm season turf. If turf is overseeded, no applications before March 5.**										
5	March	32 - 0 - 7	30	Southern Lawn 32-0-7 32% XRT	1.56	313	32	0.50 - 0.00 - 0.11			
Phosphorus											
1.5	After April 16	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	3.13	627	55	0.50 - 0.09 - 0.25			
Potassium											
2	May	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	3.13	627	55	0.50 - 0.09 - 0.25			
	June	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	6.25	1252	55	1.00 - 0.19 - 0.50			
	July	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	6.25	1252	55	1.00 - 0.19 - 0.50			
	August	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	6.25	1252	55	1.00 - 0.19 - 0.50			
	Sept 1 - Sept 15	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	6.25	0	55	1.00 - 0.19 - 0.50			
	Oct-Nov	32 - 0 - 7	30	Southern Lawn 32-0-7 32% XRT	1.56	313	32	0.50 - 0.00 - 0.11			
	No applications after September 23 on warm season turf. If turf is overseeded, no applications after December 4.										
	Lime										
	See lime application sheet										
Overseeding	Make these applications only if turf has been overseeded.										
Add 1 #/M N						**Total used:**		6.00 - 0.94 - 2.72			
	Do not exceed yearly maximum allowed by Regulation (Except for K):							**5 - 1.5 - 2**			

Notes:

- Tested M in Phosphorus and M- Potassium.
- Applications of nitrogen occurring outside of the summer months (Sep-May) must be split. Water-soluble nitrogen or products with less than 15% slowly available nitrogen must be applied with a per-application maximum of 0.35 #/M and a minimum of 15 days between applications. Products with 15% or greater slowly available nitrogen may be applied with a per-application maximum of 0.5 #/M and a minimum of 15 days between applications.

- Applications made during the summer months (Jun-Aug) have higher allowable application rates. Applications of water soluble nitrogen or products with less than 15% slowly available nitrogen must be applied with a per-application max of 0.7 #/M and a minimum of 30 days between applications. Products with 15% or greater slowly available nitrogen may be applied with a per-application max of 1 #/M.
- For overseeded warm season turf, if using a minimum of 15% slow release N, a max of 1#/M N may be used. Applications of 0.5 #/M may be applied in spring and fall. If using less than 15% slow release N, a max of 0.7 #/M N may be used. Applications of 0.35 #/M may be applied in spring and fall.

4.7. IM Fields

NUTRIENT APPLICATION WORK SHEET												
Name:	**Radford University**			**Management Area:**	**IM Fields**							
Prepared:	**6/1/2021**			**Area:**	**6.5**		**Turf Type:**		**Cool Season Irrigated Sports Turf**			
Expires:	**6/1/2024**											
Total Yearly Nutrient Needs	**AppliCation Month/Day**	**Analysis N - P - K**	**Interval (days)**	**Fertilizer Description**	**Rate/M**	**lbs/app**	**% Slow Release N**	**Total/M N - P - K**			**Lime lbs/M**	**Gypsum lbs/M**	**lbs/app lime/gyp**
Nitrogen	**No applications before March 5**												
4.2	April 15 - May 15	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	3.13	886	55	0.50	- 0.09	- 0.25			
Phosphorus													
2	June 1 - 15	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	3.13	886	55	0.50	- 0.09	- 0.25			
Potassium													
1	After August 15	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	3.13	886	55	0.50	- 0.09	- 0.25			
1	August	14 - 20 - 14	30	14-20-14 30% XRT "Starter Formulation"	6.43	1821	30	0.90	- 1.29	- 0.90			
	October	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	5.63	1594	55	0.90	- 0.17	- 0.45			
	November	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	5.63	1594	55	0.90	- 0.17	- 0.45			
	No applications after December 4												
	Lime												
	See lime application sheet												
							Total used:	4.20	- 1.90	- 2.55			
				Do not exceed yearly maximum allowed by Regulation (Except for K):				**4.2**	- **2**	- **1**			

Notes:

- Tested M- in Phosphorus and H- Potassium.
- For September through November applications, if using 100% water-soluble nitrogen 0.7 #/M may be applied every 30 days. If using slow release materials, 0.9 #/M may be used every 30 days. For applications made from April to August, the maximum application rat is 0.5 #/M every 30 days. Do not exceed stated per year total.
- Application schedule and rates are based on DCR guidelines and must be followed as written. Large applications outside of these windows or more than these rates are not permitted.

- Soluble nitrogen rates of 0.25 #/M N or less may be applied as a part of a pesticide or minor element application and can be applied any time the turf is actively growing within the frost dates but must be considered part of the total annual nitrogen.
- It is suggested that “starter fertilizer” application only be made if turf is being overseeded. If over seeding is not planned, a 16-3-8 application can be made instead.

4.8. IM/Rec Sports Common Area

NUTRIENT APPLICATION WORK SHEET											
Name:	**Radford University**			**Management Area (acres):**	**IM/Rec Sports Common Area**						
Prepared:	**6/1/2021**			**Area:**	**3.3**		**Turf Type:**	**Cool Season General Turf**			
Expires:	**6/1/2024**										
Total Yearly Nutrient Needs	**AppliCation Month/Day**	**Analysis** N - P - K	**Interval (days)**	**Fertilizer Description**	**Rate/M**	**lbs/app**	**% Slow Release N**	**Total/M** N - P - K	**Lime** lbs/M	**Gypsum** lbs/M	**lbs/app lime/gyp**
Nitrogen	**No applications before March 5**										
3.5	March	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	5.31	763	55	0.85 - 0.16 - 0.42			
Phosphorus											
2	May	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	5.31	763	55	0.85 - 0.16 - 0.42			
Potassium											
1	August	14 - 20 - 14	30	14-20-14 30% XRT "Starter Formulation"	6.43	924	30	0.90 - 1.29 - 0.90			
	November	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	5.63	809	55	0.90 - 0.17 - 0.45			
	No applications after December 4										
	Lime										
	See lime application sheet										
						Total used:		3.50 - 1.78 - 2.19			
				Do not exceed yearly maximum allowed by Regulation (Except for K):				**3.5 - 2 - 1**			

Notes:

- Tested M- in Phosphorus and H- Potassium.
- Application rates are based on use of at least 15% slow release fertilizer. 0.9 #/M N allowed if using at least 15% slow release nitrogen. If using less than 15% only 0.7 #/M nitrogen allowed.
- It is suggested that "starter fertilizer" application only be made if turf is being overseeded. If over seeding is not planned, a 16-3-8 application can be made instead.

4.9. Residential

NUTRIENT APPLICATION WORK SHEET												
Name:	**Radford University**			**Management Area (acres):**	**Residential**							
Prepared:	**6/1/2021**			**Area:**	**1.2**		**Turf Type:**	**Cool Season General Turf**				
Expires:	**6/1/2024**											
Total Yearly Nutrient Needs	**AppliCation Month/Day**	**Analysis N - P - K**	**Interval (days)**	**Fertilizer Description**	**Rate/M**	**lbs/app**	**% Slow Release N**	**Total/M N - P - K**			**Lime lbs/M**	**Gypsum lbs/M**	**lbs/app lime/gyp**
Nitrogen	**No applications before March 5**												
3.5	March	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	5.31	278	55	0.85 - 0.16 - 0.42					
Phosphorus													
2	May	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	5.31	278	55	0.85 - 0.16 - 0.42					
Potassium													
1	August	14 - 20 - 14	30	14-20-14 30% XRT "Starter Formulation"	6.43	336	30	0.90 - 1.29 - 0.90					
	November	16 - 3 - 8	30	16-3-8 50%XCU 20%Biosolids 2%Fe	5.63	294	55	0.90 - 0.17 - 0.45					
	No applications after December 4												
	Lime												
	See lime application sheet												
						Total used:		3.50 - 1.78 - 2.19					
				Do not exceed yearly maximum allowed by Regulation (Except for K):				**3.5 - 2 - 1**					

Notes:

- Tested M- in Phosphorus and H- Potassium.
- Application rates are based on use of at least 15% slow release fertilizer. 0.9 #/M N allowed if using at least 15% slow release nitrogen. If using less than 15% only 0.7 #/M nitrogen allowed.
- It is suggested that “starter fertilizer” application only be made if turf is being overseeded. If over seeding is not planned, a 16-3-8 application can be made instead.

5. Fertilizer Application Records

Fertilizer Application Records								
Location Information					**Management Area information**			
Name:	Radford University				Management Area ID:		Main Campus	
Address:	801 East Main Street				Management Area Size:		37	
	Radford, Virginia 24142				Plant Species:		Mixed cool season	
					Notes:			
Phone#:	540-831-7767							
Date	Applicator/Supervisor	Weather Info			Fertilizer Analysis	Rate	Amount Fertilizer Used	Equipment Used
		Temp	Wind	Precip				
When was the last time your fertilizer equipment was calibrated??? For information on calibration, see Chapter 10 of the "Urban Nutrient Management Handbook". Available for download at http://pubs.ext.vt.edu/430/430-350/430-350.html								

Fertilizer Application Records

Location Information		Management Area information	
Name:	Radford University	Management Area ID:	Dedmon Athletic Complex
Address:	801 East Main Street	Management Area Size:	37
	Radford, Virginia 24142	Plant Species:	Mixed cool season
		Notes:	
Phone#:	540-831-7767		

Date	Applicator/Supervisor	Weather Info			Fertilizer Analysis	Rate	Amount Fertilizer Used	Equipment Used
		Temp	Wind	Precip				

When was the last time your fertilizer equipment was calibrated???
For information on calibration, see Chapter 10 of the "Urban Nutrient Management Handbook".
Available for download at http://pubs.ext.vt.edu/430/430-350/430-350.html

Fertilizer Application Records

Location Information		Management Area information	
Name:	Radford University	Management Area ID:	Cupp Stadium
Address:	801 East Main Street	Management Area Size:	2.3
	Radford, Virginia 24142	Plant Species:	warm season
		Notes:	
Phone#:	540-831-7767		

Date	Applicator/Supervisor	Weather Info			Fertilizer Analysis	Rate	Amount Fertilizer Used	Equipment Used
		Temp	Wind	Precip				

When was the last time your fertilizer equipment was calibrated???
For information on calibration, see Chapter 10 of the "Urban Nutrient Management Handbook".
Available for download at http://pubs.ext.vt.edu/430/430-350/430-350.html

Fertilizer Application Records

Location Information		Management Area information	
Name:	Radford University	Management Area ID:	Field Hockey
Address:	801 East Main Street	Management Area Size:	2
	Radford, Virginia 24142	Plant Species:	warm season
		Notes:	
Phone#:	540-831-7767		

Date	Applicator/Supervisor	Weather Info			Fertilizer Analysis	Rate	Amount Fertilizer Used	Equipment Used
		Temp	Wind	Precip				

When was the last time your fertilizer equipment was calibrated???
For information on calibration, see Chapter 10 of the "Urban Nutrient Management Handbook".
Available for download at http://pubs.ext.vt.edu/430/430-350/430-350.html

Fertilizer Application Records

Location Information		Management Area information	
Name:	Radford University	Management Area ID:	Softball
Address:	801 East Main Street	Management Area Size:	0.7
	Radford, Virginia 24142	Plant Species:	warm season
		Notes:	
Phone#:	540-831-7767		

Date	Applicator/Supervisor	Weather Info			Fertilizer Analysis	Rate	Amount Fertilizer Used	Equipment Used
		Temp	Wind	Precip				

When was the last time your fertilizer equipment was calibrated???
For information on calibration, see Chapter 10 of the "Urban Nutrient Management Handbook".
Available for download at http://pubs.ext.vt.edu/430/430-350/430-350.html

Fertilizer Application Records

Location Information		Management Area information	
Name:	Radford University	Management Area ID:	Practice Fields
Address:	801 East Main Street	Management Area Size:	4.6
	Radford, Virginia 24142	Plant Species:	warm season
		Notes:	
Phone#:	540-831-7767		

Date	Applicator/Supervisor	Weather Info			Fertilizer Analysis	Rate	Amount Fertilizer Used	Equipment Used
		Temp	Wind	Precip				

When was the last time your fertilizer equipment was calibrated???
For information on calibration, see Chapter 10 of the "Urban Nutrient Management Handbook".
Available for download at http://pubs.ext.vt.edu/430/430-350/430-350.html

Fertilizer Application Records

Location Information		Management Area information	
Name:	Radford University	Management Area ID:	IM Fields
Address:	801 East Main Street	Management Area Size:	6.5
	Radford, Virginia 24142	Plant Species:	cool season
		Notes:	
Phone#:	540-831-7767		

Date	Applicator/Supervisor	Weather Info			Fertilizer Analysis	Rate	Amount Fertilizer Used	Equipment Used
		Temp	Wind	Precip				

When was the last time your fertilizer equipment was calibrated???
For information on calibration, see Chapter 10 of the "Urban Nutrient Management Handbook".
Available for download at http://pubs.ext.vt.edu/430/430-350/430-350.html

Fertilizer Application Records

Location Information		Management Area information	
Name:	Radford University	Management Area ID:	IM/Rec Common Areas
Address:	801 East Main Street	Management Area Size:	3.3
	Radford, Virginia 24142	Plant Species:	cool season
		Notes:	
Phone#:	540-831-7767		

Date	Applicator/Supervisor	Weather Info			Fertilizer Analysis	Rate	Amount Fertilizer Used	Equipment Used
		Temp	Wind	Precip				

When was the last time your fertilizer equipment was calibrated???
For information on calibration, see Chapter 10 of the "Urban Nutrient Management Handbook".
Available for download at http://pubs.ext.vt.edu/430/430-350/430-350.html

Fertilizer Application Records

Location Information		Management Area information	
Name:	Radford University	Management Area ID:	Residential
Address:	801 East Main Street	Management Area Size:	1.2
	Radford, Virginia 24142	Plant Species:	cool season
		Notes:	
Phone#:	540-831-7767		

Date	Applicator/Supervisor	Weather Info			Fertilizer Analysis	Rate	Amount Fertilizer Used	Equipment Used
		Temp	Wind	Precip				

When was the last time your fertilizer equipment was calibrated???
For information on calibration, see Chapter 10 of the "Urban Nutrient Management Handbook".
Available for download at http://pubs.ext.vt.edu/430/430-350/430-350.html

6. Reference Material

Nutrient Availability According to pH

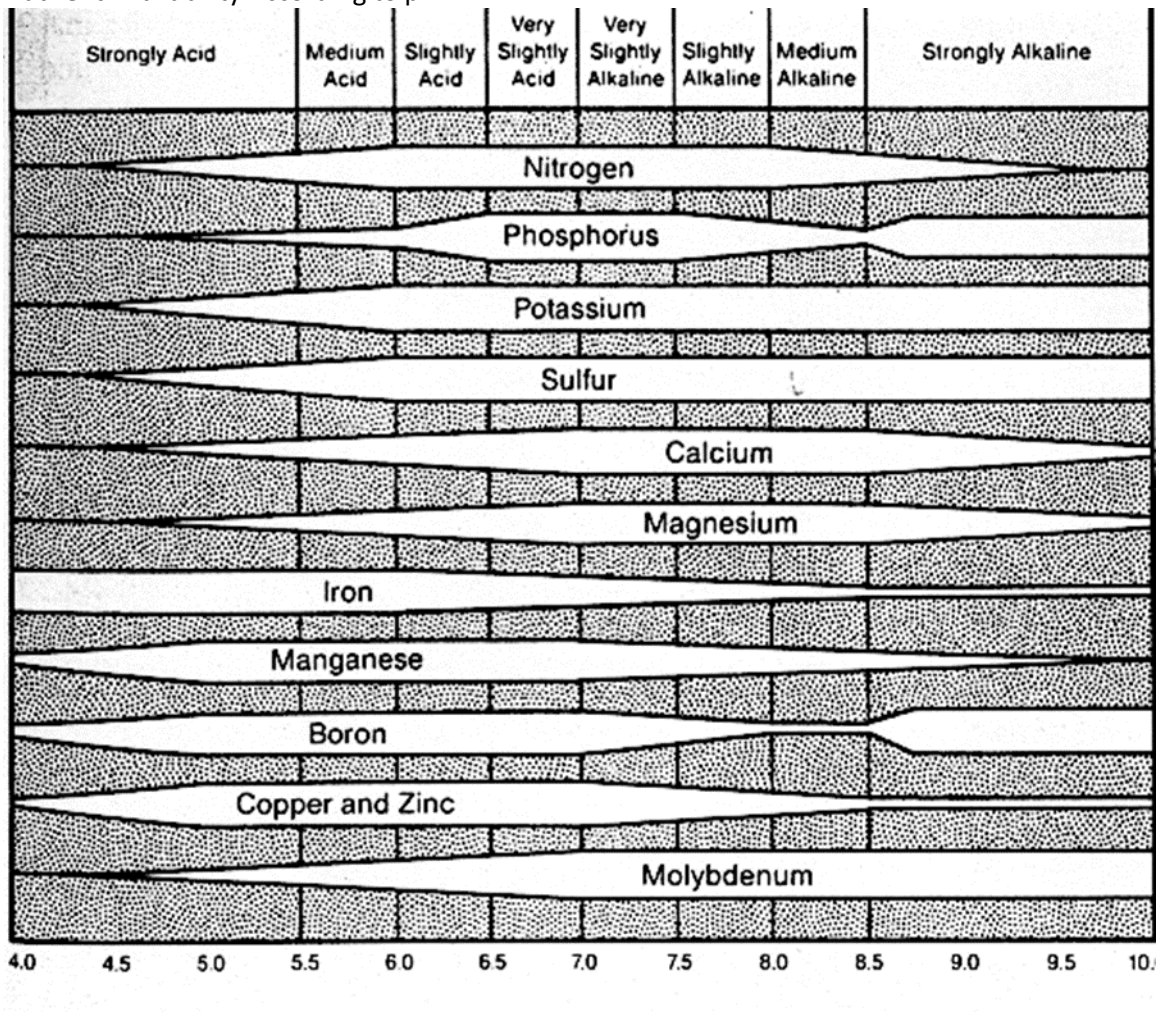


Figure 1: Nutrient Availability at pH

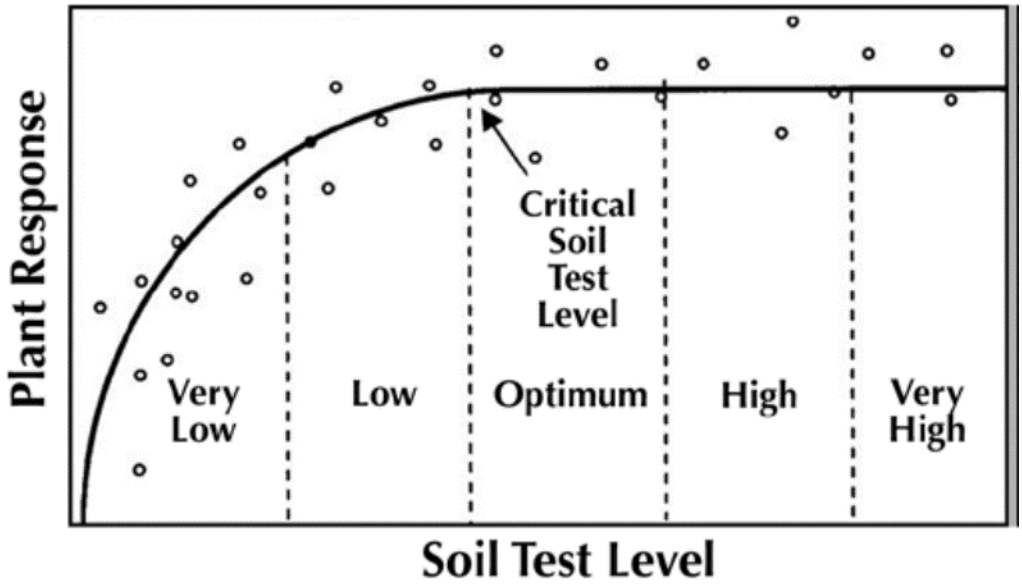


Figure 2: Plant Response Chart

Very low: A plant response is most likely if the indicated nutrient is applied. A large portion of the nutrient requirement must come from fertilization.

Low: A plant response is likely if the indicated nutrient is applied. A portion of the nutrient requirement must come from fertilization.

Medium: A plant response may or may not occur if the indicated nutrient is applied. A small portion of the nutrient requirement must come from fertilization.

High: Plant response is not expected. No additional fertilizer is needed.

Very high: Plant response is not expected. The soil can supply much more than the turf requires. Additional fertilizer should not be added to avoid nutritional problems and adverse environmental consequences.

Section VI. Turfgrass Nutrient Recommendations for Home Lawns, Office Parks, Public Lands and Other Similar Residential/Commercial Grounds

Definitions

For the purposes of this section, the following definitions, as presented by the Association of American Plant Food Control Officials (AAPFCO), apply:

"Enhanced efficiency fertilizer" describes fertilizer products with characteristics that allow increased plant nutrient availability and reduce the potential of nutrient losses to the environment when compared to an appropriate reference product.

"Slow or controlled release fertilizer" means a fertilizer containing a plant nutrient in a form which delays its availability for plant uptake and use after application, or which extends its availability to the plant significantly longer than a reference "rapidly available nutrient fertilizer" such as ammonium nitrate, urea, ammonium phosphate or potassium chloride. A slow or controlled release fertilizer must contain a minimum of 15 percent slowly available forms of nitrogen.

"Water soluble nitrogen", "WSN", or "readily available nitrogen" means: Water soluble nitrogen in either ammonical, urea, or nitrate form that does not have a controlled release, or slow response.

Recommended Season of Application For Nitrogen Fertilizers - Applies to all Turf

A nitrogen fertilization schedule weighted toward fall application is recommended and preferred for agronomic quality and persistence of cool season turfgrass; however, the acceptable window of applications is much wider than this for nutrient management. The nutrient management recommended application season for nitrogen fertilizers to cool season turfgrasses begins six weeks prior to the last spring average killing frost date and ends six weeks past the first fall average killing frost date (see Figures 6-1 & 6-2). Applications of nitrogen during the intervening late fall and winter period should be avoided due to higher potential leaching or runoff risk, but where necessary, apply no more than 0.5 pounds per 1,000 ft^2 of water soluble nitrogen within a 30-day period. Higher application rates may be used during this late fall and winter period by using materials containing slowly available sources of nitrogen, if the water soluble nitrogen contained in the fertilizer does not exceed the recommended maximum of 0.5 pounds per 1,000 ft^2 rate. Do not apply nitrogen or phosphorus fertilizers when the ground is frozen.

The acceptable nitrogen fertilizer application season for non-overseeded warm season turfgrass begins no earlier than the last spring average killing frost date and ends no later than one month prior to the first fall average killing frost date (see Figures 6-1 & 6-2).

Figure 6-1

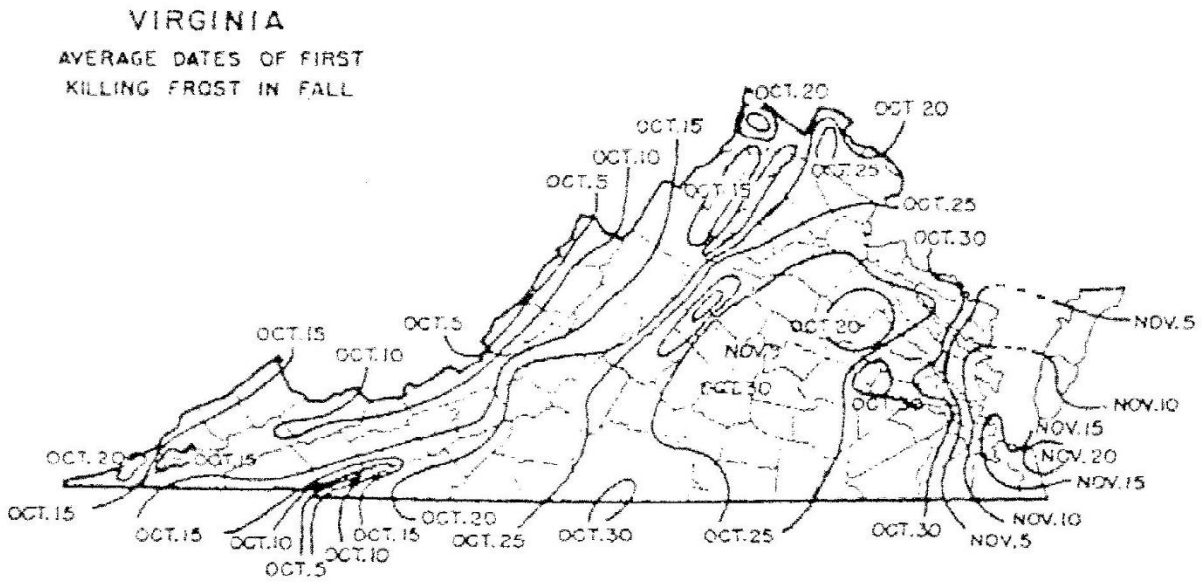
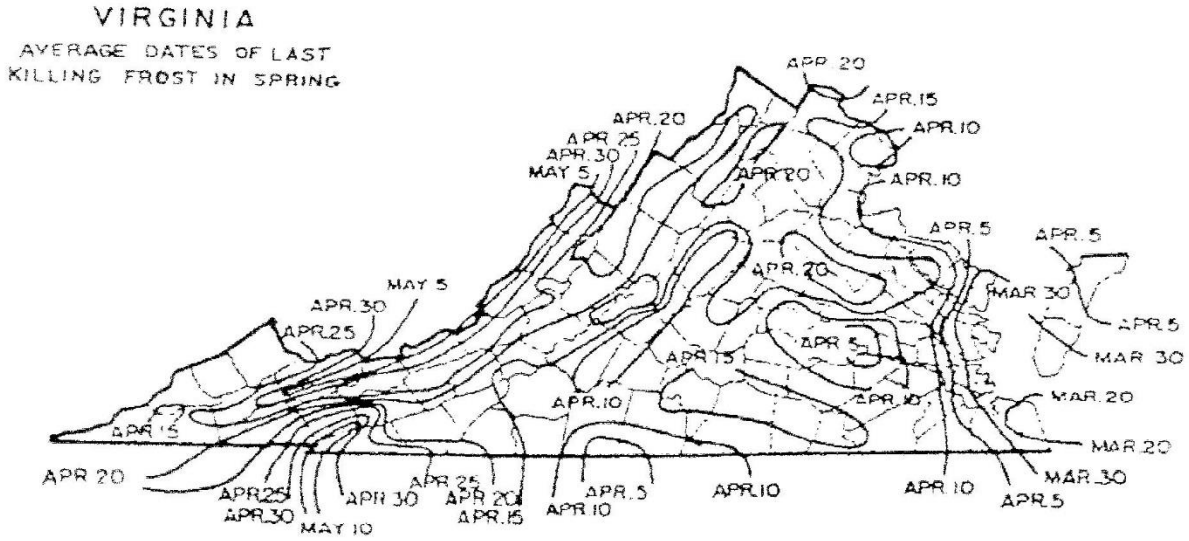


Figure 6-2



Per Application Rates

Do not apply more than 0.7 pounds of water soluble nitrogen per 1,000 ft^2 within a 30-day period. For cool season grasses, do not apply more than 0.9 pounds of total nitrogen per 1,000 ft^2 within a 30-day period. For warm season grasses, do not apply more than 1.0 pounds of total nitrogen per 1,000 ft^2 within a 30-day period. Lower per application rates of water soluble nitrogen sources or use of slowly available nitrogen sources should be ut ilized on very permeable sandy soils, shallow soils over fractured bedrock, or areas near water wells.

Annual Application Rates for Home Lawns and Commercial Turf

Up to 3.5 pounds per 1,000 ft^2 of nitrogen may be applied annually to cool season grass species or up to 4 pounds per 1,000 ft^2 may be applied annually to warm season grass species using 100 percent water soluble nitrogen sources. Lower rates of nitrogen application may be desirable on those mature stands of grasses that require less nitrogen for long-term quality. As a result, lower application rates will probably be more suited to the fine leaf fescues (hard fescue, chewings fescue, creeping red fescue, and sheep fescue) and non-overseeded zoysiagrass. Lower rates should also be used on less intensively managed areas.

Use of Slowly Available Forms of Nitrogen

For slow or controlled release fertilizer sources, or enhanced efficiency fertilizer sources, no more than 0.9 pounds of nitrogen per 1,000 ft^2 may; be applied to cool season grasses within a 30-day period and no more than 1.0 pounds of nitrogen per 1,000 ft^2 may be applied to warm season grasses within a 30-day period.

Provided the fertilizer label guarantees that the product can be used in such a way that it will not release more than 0.7 pounds of nitrogen per 1,000 ft^2 in a 30-day period, no more than 2.5 pounds of nitrogen per 1,000 ft^2 may be applied in a single application. Additionally, total annual applications shall not exceed 80 percent of the annual nitrogen rates for cool or warm season grasses.

Phosphorus and Potassium Nutrient Needs (Established Turf)

Apply phosphorus (P_2O_5) and potassium (K_2O) fertilizers as indicated necessary by a soil test using the following guidelines:

Soil Test Level	Nutrient Needs (pounds per 1,000 ft^2)*	
	P_2O_5	K_2O
L	2-3	2-3
M	1-2	1-2
H	0.5-1	0.5-1
VH	0	0

* For the lower soil test level within a rating, use the higher side of the range and for higher soil test level within a rating use the lower side of the recommendation range. (For example the recommendation for a P_2O_5 soil test level of L- would be 3 pounds per 1,000 ft^2.)

Do not use high phosphorus ratio fertilizers such as 10-10-10 or 5-10-10, unless soil tests indicate phosphorus availability below the M+ level.

Recommendations for Establishment of Turf

These recommendations are for timely planted turfgrass, that is, the seed or vegetative material (sod, plugs, and /or sprigs), are planted at a time of the year when temperatures and moisture are adequate to maximize turfgrass establishment. These recommended establishment periods would be late summer to early fall for cool-season turfgrasses and late spring through mid-summer for warm-season turfgrasses.

Nitrogen Applications

At the time of establishment, apply no more than 0.9 pounds per 1,000 ft^2 of total nitrogen for cool season grasses or 1.0 pounds per 1,000 ft^2 of total nitrogen for warm season grasses, using a material containing slowly available forms of nitrogen, followed by one or two applications beginning 30 days after planting, not to exceed a total of 1.8 pounds per 1,000 ft^2 total for cool season grasses and 2.0 pounds per 1,000 ft^2 for warm season grasses for the establishment period. Applications of WSN cannot exceed more than 0.7 pounds per 1,000 ft^2 within a 30-day period.

Phosphorus and Potassium Recommendations for Establishment

Soil Test Level	Nutrient Needs (pounds per 1,000 ft^2) *	
	P_2O_5	K_2O
L	3-4	2-3
M	2-3	1-2
H	2-1	0.5-1
VH	0	0

* For the lower soil test level within a rating, use the higher side of the range and for higher soil test level within a rating use the lower side of the recommendation range.

Nutrient Recommendations for Golf Courses

Nitrogen Timing

The beginning and ending dates for application of nitrogen shall be determined using guidance and frost date maps contained in the Season of Application for Nitrogen section, Figures 6-1 and 6-2.

If the full rate or the highest rate of the recommendation range for a monthly application is applied in a single application, then the interval of application for nitrogen shall be at least 30 days to allow turf to utilize previous nitrogen applications. If several applications are to be made for the monthly nitrogen rate, then the timing of the applications shall be at approximately even intervals, with the rate per application to be evenly divided between each application with the total nitrogen applied not to exceed the maximum monthly rate. Use of Water Insoluble Nitrogen forms of Nitrogen is encouraged.

Nitrogen Rates

	Grass Type	Maximum WSN Rate Per Application - pounds per 1,000 ft^2	Total Annual Nitrogen Rate - pounds per 1,000 ft^2 [a]
Greens		0.7 [b]	3-6
Tees		0.7 [b]	2-5
Fairways	Cool Season	0.7 [c]	2-3
	Warm Season	0.7 [c]	3-4
Fairways – Intensive Management	Cool Season	0.5 [d]	3-4
	Warm Season	0.5 [d]	3.5-4.5
Overseeding Warm Season Fairways		.5	1.25
Roughs		0.7 [e]	1-3

Fairways-Overseeding Warm Season Fairways

- For warm season grasses, up to 0.7 pounds of nitrogen per 1,000 ft^2 in a 30-day period may be applied in the Fall after perennial ryegrass overseeding is well established. An additional nitrogen application of 0.7 pounds per 1,000 ft^2 may be made in February-March to overseeded perennial ryegrass if growth and color indicate need. Applications using WSN may not exceed 0.7 pounds per 1,000 ft^2 within a 30-day period.

- Soluble nitrogen rates of 0.25 pounds per 1,000 ft^2 or less which may be a component of a pesticide or minor element application, may be applied any time during the application windows described in Recommended Season of Application for Nitrogen Fertilizers of this section, but must be considered with the total annual nitrogen application rate.

(a)Use higher rates for intensively used turf where accelerated growth and/or rapid recovery are required, use lower rates for maintenance of lesser used areas; do not exceed total annual nitrogen levels as stated above.

(b)Greens and Tees – Per application timing must be a minimum of 30 days between applications. A rate of 0.9 pounds per 1,000 ft^2 of total nitrogen may be applied for cool season grasses or 1.0 pounds per 1,000 ft^2 of total nitrogen may be applied for warm season grasses using a material containing slowly available forms of nitrogen.

(c) Fairways-Normal Management (Non-Irrigated or Irrigated) - Per Application timing must be a minimum of 30 days between applications. Total nitrogen application rates of 0.9 pounds per 1,000 ft^2 of total nitrogen may be applied for cool season grasses or 1.0 pound per 1,000 ft^2 of total nitrogen may be applied for warm season grasses using a material containing slowly available forms of nitrogen.

(d) Fairways-Intensive Management (Irrigated)- Per Application timing must be a minimum of 15 days between applications. This option requires optimized timing of more frequent applications of nitrogen with lesser rates per application. Alternatively, a maximum application rate of 0.9 pounds per 1,000 ft^2 of total nitrogen for cool season grasses or 1.0 pounds per 1,000 ft^2 of total nitrogen for warm season grasses using a material containing slowly available forms of nitrogen may be applied with a minimum of 30 days between applications.

(e) Foliar fertilizer may be applied to warm season grasses within 30 days prior to the first killing frost in the fall, at a rate not to exceed 0.1 pounds per 1,000 ft^2 of nitrogen per application. This application must be accounted for in the total annual nitrogen rate.

Phosphorus and Potassium Recommendations for Established Golf Courses

Apply phosphorus (P_2O_5) and potassium (K_2O) fertilizers as indicated by a soil test using the following guidelines:

Soil Test Level	Nutrient Needs (pounds per 1,000 ft^2)*	
	P_2O_5	K_2O
L	2-3	2-3
M	1-2	1-2
H	0.5-1	0.5-1
VH	0	0

* For the lower soil test level within a rating, use the higher side of the range and for higher soil test level within a rating use the lower side of the recommendation range.

- For irrigated turf grown on Naturally Occurring and Modified Sand Based soils only, up to 0.5 pounds of P_2O_5 per 1,000 ft^2 may be applied, if needed, to aid in recovery of damaged turf during times of extreme use. No phosphorus applications shall be made when the soil phosphorus test level is above 65% saturation, based on the soil test phosphorus values and region as listed in Table 4-1 of Section IV.

- Avoid the general use of high phosphorus ratio fertilizers such as 10-10-10 or 5-10-10, unless soil tests indicate phosphorus availability below the M+ level.

Nitrogen Management on Athletic Fields - Cool Season Grasses

- This program is intended for those fields which are under heavy use.

- Nitrogen recommendations are based on the assumption that there is adequate soil moisture to promote good turf growth at the time of application. If no rainfall has occurred since the last application, further applications should be delayed until significant soil moisture is available.

Cool Season Grasses	Maintenance Program[a] Normal	Intensive
When to Apply[b]	Pounds per 1,000 ft^2 Nitrogen	
After August 15	------	0.5
September	0.7	0.7[c]
October	0.7[c]	0.7[c]
November	0.5	0.7[c]
April 15 - May 15	0.5	0.5
June 1 - June 15	----	0.5

Notes:

- Soluble nitrogen rates of 0.25 pounds per 1,000 ft^2 or less which may be a component of a pesticide or minor element application may be applied any time the turf is actively growing, but must be considered with the total annual nitrogen application rate.
- WSN = water soluble nitrogen; WIN = water insoluble nitrogen

(a) Intensive managed areas must be irrigated.

(b) The beginning and ending dates for application of nitrogen shall be determined using guidance and frost date maps contained in the preceding Season of Application for Nitrogen section, using Figures 6-1 and 6-2.

(c) Rates up to 0.9 pounds per 1,000 ft^2 of total nitrogen can be applied using a material containing slowly available forms of nitrogen, with a minimum of 30 days between applications.

(d) Make this application only if turf use warrants additional nitrogen for sustaining desirable growth and /or color.

Nitrogen Management on Athletic Fields - Warm Season Grasses

The following comments apply to both Naturally Occurring or Modified Sand based Fields and Predominantly Silt/Clay Soil Fields:

- Annual nitrogen rates for warm season grasses shall not exceed **4 pounds** in areas which have the average first killing frost on or before October 20, and shall not exceed **5 pounds** in areas which have the average first killing frost after October 20 as shown in Figure 6-1. Nitrogen rates and timings for overseeding warm season grasses are not included in these rates.
- April 15 - May 15 applications should not be made until after complete green-up of turf.
- Nitrogen applications June through August should be coordinated with anticipated rainfall if irrigation is not available.
- Use the lower end of the ranges for non-irrigated fields and the higher end of the ranges should be used on fields with irrigation.

- Nitrogen rates towards the higher end of the ranges may be applied on heavily used fields to accelerate recovery, however per application and annual rates cannot be exceeded.

Bermudagrass - Predominantly Silt/Clay Soil Fields [a]		
When to Apply[b]	**Pounds per 1,000 ft^2 Nitrogen[e]**	**First Fall Killing Frost Date[b]**
April 15 - May 15	0.5- 0.7[(c)]	Before Oct. 20
June	0.7	
July	0.5 – 0.7 [(d)]	
August	0.5 - 0.7 [(d)]	
Sept 1 - Sept 15	0.5 -0.7 [(c)]	After Oct. 20
If overseeded with perennial ryegrass		
Oct - Nov	0.5 [(e)]	
Feb-Mar	0.5 [(e)]	

Bermudagrass - Naturally Occurring or Modified Sand based Fields [a]		
When to Apply[b]	**Pounds per 1,000 ft^2 Nitrogen**	**First Fall Killing Frost Date[b]**
April 15 - May 15	0.5 -0.7[(c)]	Before Oct. 20
June1	0.7[(c)]	
July	0.7[(c)]	
August	0.7[(c))]	
Sept 1 - Sept 15	0.7[c]	After Oct. 20
If overseeded with perennial ryegrass		
Oct - Nov	0.5 [(e)]	
Feb - Mar	0.5 [(e)]	

The following notes apply to both of the Bermudagrass tables above:

(a) In the Piedmont and the Ridge and Valley areas of Virginia, the existing native soil will normally be comprised predominantly of clay and/or silt and these soils have inherently lower water infiltration and percolation rates and greater nutrient holding capacity. However, most areas of the Coastal Plain have existing native soils that are predominantly sandy textured soils and other facilities throughout the state may choose to install modified soil root zones that are predominantly sand (>50%) in order to maximize drainage and reduce compaction tendency. If subsurface drain tile surrounded by sand and/or gravel has been installed under the playing surface of any of these fields, their nitrogen programs should be managed as predominantly sand-based systems to minimize nutrient leaching.

(b) The beginning and ending dates for application of nitrogen shall be determined using guidance and frost date maps contained in the Season of Application for Nitrogen section, Figures 6-1 and 6-2.

(c) WSN must be applied as two applications not to exceed 0.35 pounds per 1,000 ft^2 each with a minimum of 15 days between applications. Alternatively, using a material that contains slowly available nitrogen sources, split applications of 0.5 pounds per 1,000 ft^2 may be applied with a minimum of 15 days between applications.

(d) If a material containing slowly available forms of nitrogen is used, rates up to 1.0 pounds of nitrogen per 1,000 ft^2 may be applied in a single application with a minimum of 30 days between applications.

(e) For overseeded warm season grasses, an additional 0.7 pounds per 1,000ft^2 of WSN may be applied in the Fall after the perennial ryegrass overseeding is well established. The WSN must be applied as two applications not to exceed 0.35 pounds per 1,000 ft^2 of nitrogen each, with a minimum of 15 days between applications. Additional WSN application of 0.5 pounds per 1,000 ft^2 may be made in February-March to overseeded perennial ryegrass if growth and color indicate need. Alternatively, split applications of 0.5 pounds of nitrogen per 1,000 ft^2 each with a minimum of 15 days between applications may be applied using a material containing slowly available nitrogen sources.

Phosphorus and Potassium Recommendations Athletic Fields
Apply phosphorus (P_2O_5) and potassium (K_2O) fertilizers as indicated by a soil test using the following guidelines:

Soil Test Level	Nutrient Needs (pounds per 1,000 ft^2)*	
	P_2O_5	K_2O
L	2-3	2-3
M	1-2	1-2
H	0.5-1	0.5-1
VH	0	0

* For the lower soil test level within a rating, use the higher side of the range and for higher soil test level within a rating use the lower side of the recommendation range.

- For irrigated turf grown on Naturally Occurring and Modified Sand Based soils only, up to 0.5 pounds of P_2O_5 per 1,000 ft^2 may be applied, if needed, to aid in recovery of damaged turf during times of extreme use. No phosphorus applications shall be made when the soil phosphorus test level is above 65% saturation, based on the soil test phosphorus values and region as listed in Table 4-1 of Section IV.

- Avoid the general use of high phosphorus ratio fertilizers such as 10-10-10 or 5-10-10, unless soil tests indicate phosphorus availability below the M+ level.

Establishment/Grow-In Recommendations for Golf Courses, Athletic Fields, and Sod Production

(These rates replace normal maintenance fertilizer applications that would have occurred during these time periods.)

Warm Season Grasses:

Predominantly Silt/Clay Soils

- Plant Date - late May -June for sprigs, plugs, sod, or seeding.
- Apply P_2O_5 and K_2O as needed based on soil test recommendations, incorporate into the top 2 inches if possible.
- At Planting - Up to 1.0 pounds of nitrogen per 1,000 ft^2 using a material containing slowly available forms of nitrogen may be applied as one application or lesser amounts applied at regular intervals, through the first 4 weeks, not to exceed a total of 1.0 pounds of nitrogen per 1,000ft^2.
- Four weeks after planting - 0.25 pounds.of WSN per 1,000 ft^2 per week for the next 4 weeks.

Naturally Occurring or Modified Sand Based Soils

- Plant Date - late May -June for sprigs, plugs, sod, or seeding.
- Apply P_2O_5 and K_2O as needed based on soil test recommendations, incorporate into the top 2 inches if possible.
- At Planting - Up to 1.0 pounds of nitrogen per 1,000 ft^2 using a material containing slowly available forms of nitrogen may be applied as one application or lesser amounts at regular intervals through the first 4 weeks, not to exceed a total of 1.0 pounds of nitrogen per 1,000 ft^2.
- Four weeks after planting - 0.25 pounds per1,000 ft^2 using a material containing slowly available forms of nitrogen per week for the next 4 weeks.

Cool Season Grasses:

Predominantly Silt/Clay Soils

- Plant Date - August - September (preferred)
- Apply P_2O_5 and K_2O as needed based on soil test recommendations, incorporate into the top 2 inches if possible.
- At Planting - up to 0.9 pounds of nitrogen per 1,000 ft^2 using a material containing slowly available forms of nitrogen may be applied; 30 days after planting, apply up to 0.5 pounds of nitrogen per 1,000 ft^2 every week for the next 4 weeks.

Naturally Occurring or Modified Sand Based Soils

- Plant Date - August -September (preferred)
- Apply P_2O_5 and K_2O as needed based on soil test recommendations, incorporate into the top 2 inches if possible.
- At Planting - up to 0.9 pounds of nitrogen per 1,000 ft^2 using a material containing slowly available forms of nitrogen may be applied.
- Apply up to 0.25 pounds of nitrogen per 1,000 ft^2 per week after germination is complete, for the next 8 weeks. If using a material that contains slowly available forms of nitrogen, up to 0.5 pounds of nitrogen per 1,000 ft^2 every two weeks may be applied after germination is complete for the next 8 weeks.

Sod Installations:

Site preparation should include a soil test, which can be done several months before the project begins in order to have time to get test results back. Phosphorus, potassium and lime applications should be based on soil test analysis to increase the likelihood of a successful installation. Shallow incorporation of material into the top 2 inches of the soil is preferred prior to sod installation, especially if lime is required.

No more than 0.7 pounds of nitrogen per 1,000 ft^2 of WSN may be applied before sod is installed. Alternatively, using a material with slowly available forms of nitrogen, 0.9 pounds of nitrogen per 1,000 ft^2 for cool season grasses or 1.0 pounds of nitrogen per 1,000 ft^2 for warm season grasses may be applied before sod is installed.

After installation apply adequate amounts of water to maintain sufficient soil moisture (i.e. to prevent visible wilt symptoms). Excessive water will limit initial root development. After roots begin to establish (as verified by lightly tugging on the sod pieces), shift irrigation strategy to a deep and infrequent program in order to encourage deep root growth. Apply approximately 1 inch of water per week (either by rainfall or irrigation), making sure that the water is being accepted by the soil profile without running off. This will insure thorough wetting of the soil profile.

After sod has completed rooting and is well established, initiate the normal nitrogen management program as described for the appropriate use shall be recommended.

Phosphorus and Potassium Recommendations for Establishment/Grow-In/Installation

Soil Test Level	Nutrient Needs (pounds per 1,000 ft^2) *	
	P_2O_5	K_2O
L	3-4	2-3
M	2-3	1-2
H	2-1	0.5-1
VH	0	0

* For the lower soil test level within a rating, use the higher side of the range and for higher soil test level within a rating use the lower side of the recommendation range.

Other Turf Management Considerations for Golf Courses, Athletic fields, and Home Lawns

Lime Recommendations

Lime should be recommended based on a soil test to maintain soil pH within an agronomic range for turfgrass.

For new seedings where lime is recommended, incorporate the lime into the topsoil for best results.

Returning Grass Clippings

Recycling of clippings on turf should be encouraged as an effective means of recycling nitrogen, phosphorus, and potassium. Proper mowing practices that ensure no more than 1/3 of the leaf blade is removed in any cutting event will enhance turf appearance and performance when clippings are returned. Return all leaf clippings from mowing events to the turf rather than discharging them onto sidewalks or streets. Rotary mulching mowers can further enhance clipping recycling by reducing the size of clippings being returned to the turfgrass canopy.

Management of Collected Clippings

If clippings are collected they should be disposed of properly. They may be composted or spread uniformly as a thin layer over other turf areas or areas where the nutrient content of the clippings can be recycled through actively growing plants. They should not be blown onto impervious surfaces or surface waters, dumped down stormwater drains, or piled outside where rainwater will leach out the nutrients creating the potential for nutrient loss to the environment.

Use of Iron

Iron applications (particularly foliar applications) may periodically be used for enhanced greening as an alternative to nitrogen. These applications are most beneficial if applied in late spring through summer for cool season grasses and in late summer/fall applications for warm-season grasses.

Impervious Surfaces

Do not apply fertilizers containing nitrogen or phosphorus to impervious surfaces (sidewalks, streets, etc.). Remove any granular materials that land on impervious surfaces by sweeping and collecting, and either put the collected material back in the bag, or spread it onto the turf and /or using a leaf blower etc. to return the fertilizer back to the turfgrass canopy.

Table 3-1
Lime Recommendations for Virginia Crops (tons/acre)
Lime Rates based on Va Tech Soil buffer pH

	Target Soil pH					
Buffer pH	5.2	5.8.	6.2	6.5	6.8	Acidity meq/100g
6.60	0.00	0.00	0.00	0.00	0.00	0.00
6.50	0.00	0.00	0.00	0.00	0.00	0.03
6.40	0.00	0.00	0.00	0.00	0.50	0.06
6.38	0.00	0.00	0.25	0.25	0.50	0.12
6.36	0.00	0.00	0.25	0.25	0.75	0.24
6.34	0.00	0.00	0.25	0.50	0.75	0.36
6.32	0.00	0.00	0.50	0.50	0.75	0.48
6.30	0.00	0.00	0.50	0.75	1.00	0.59
6.28	0.00	0.25	0.75	0.75	1.00	0.71
6.26	0.00	0.25	0.75	1.00	1.25	0.83
6.24	0.00	0.25	0.75	1.00	1.25	0.95
6.22	0.00	0.50	1.00	1.00	1.50	1.07
6.20	0.00	0.50	1.00	1.25	1.50	1.19
6.18	0.00	0.75	1.25	1.25	1.75	1.30
6.16	0.00	0.75	1.25	1.50	1.75	1.42
6.14	0.25	0.75	1.50	1.50	2.00	1.54
6.12	0.25	1.00	1.50	1.75	2.00	1.66
6.10	0.50	1.00	1.50	1.75	2.25	1.78
6.08	0.50	1.25	1.75	2.00	2.25	1.90
6.06	0.50	1.25	1.75	2.00	2.25	2.02
6.04	0.75	1.25	2.00	2.00	2.50	2.13
6.02	0.75	1.50	2.00	2.25	2.50	2.25
6.00	1.00	1.50	2.00	2.25	2.75	2.37
5.95	1.00	1.75	2.25	2.50	3.00	2.67
5.90	1.25	2.00	2.50	3.00	3.25	2.96
5.85	1.50	2.25	2.75	3.25	3.50	3.26
5.80	1.75	2.50	3.25	3.50	3.75	3.56
5.75	2.00	2.75	3.50	3.75	4.25	3.85
5.70	2.25	3.00	3.75	4.00	4.50	4.15
5.65	2.50	3.25	4.00	4.25	4.75	4.45
5.60	2.75	3.50	4.25	4.50	5.00	4.74
5.55	3.00	3.75	4.50	4.75	5.25	5.04
5.50	3.25	4.00	4.75	5.25	5.50	5.34
5.40	3.75	4.50	5.25	5.75	6.25	5.93
5.30	4.25	5.00	5.75	6.25	6.75	6.52

Lime recommendations in the table above are based on the use of a liming material equivalent in neutralizing power to 100% $CaCO_3$. For application rates of liming material that is less than 100% neutralizing power of $CaCO_3$ (pure calcium carbonate) use the table in this section, Lime Rate Adjustment for CCE.

Lime Recommendations Using Other Testing Labs

For approved labs other than Virginia Tech, use the lime recommendations given by the lab. IF there are no recommendations with the soil analysis, use the table below for A&L Agricultural, Spectrum Analytical, and Brookside Laboratories.

Table 3-2
Lime Application Rate[1] (tons/acre) to achieve desired pH based on SMP Buffer Test

	Target Soil pH				
Soil-Buffer pH	5.2	5.8	6.2	6.5	6.8
6.9	0	0.25	0.50	0.50	0.75
6.8	0.50	0.75	1.00	1.00	1.25
6.7	1.00	1.50	1.50	1.75	2.00
6.6	1.50	1.75	2.00	2.25	2.50
6.5	2.00	2.25	2.50	3.00	3.25
6.4	2.75	3.00	3.25	3.75	4.00
6.3	3.25	3.50	4.00	4.50	5.00

[1] Ag-ground lime of 90% plus total neutralizing power (TNP) or $CaCO_3$equivalent., and fineness of 40% < 100 mesh, 50% < 60 mesh, 70% < 20 mesh and 95% < 8 mesh. Adjustments in the application rate should be made for liming materials with different particle sizes, or neutralizing value.

Waters Agricultural Laboratories uses the Adams and Evans single buffer method which uses a different table for recommendations than the Mehlich or the SMP tables supplied here. In the event you would have lab reports from Waters Lab, which do not have lime recommendations, contact the lab for recommendations based on their analysis procedure.

Lime Rate Adjustment for CCE

Using the lime application rate to achieve the desired target pH based on the soil test buffer pH, use the table below to adjust that rate based on the % CCE of the liming material to be applied.

Table 3-3
Lime Application Rate Adjustment Based on % CCE of Material

	% CCE of Your Liming Material										
T/ac*	**50**	**60**	**70**	**80**	**90**	**100**	**110**	**120**	**130**	**140**	**150**
0.5	1.00	0.75	0.75	0.75	0.50	0.50	0.50	0.50	0.50	0.25	0.25
1.0	2.00	1.75	1.50	1.25	1.00	1.00	1.00	0.75	0.75	0.75	0.75
1.5	3.00	2.50	2.25	2.00	1.75	1.50	1.25	1.25	1.25	1.00	1.00
2.0	4.00	3.25	2.75	2.50	2.25	2.00	1.75	1.75	1.50	1.50	1.25
2.5	5.00	4.25	3.50	3.25	2.75	2.50	2.25	2.00	2.00	1.75	1.75
3.0	6.00	5.00	4.25	3.75	3.25	3.00	2.75	2.50	2.25	2.25	2.00
3.5	7.00	5.75	5.00	4.50	4.00	3.50	3.25	3.00	2.75	2.50	2.25
4.0	8.00	6.75	5.75	5.00	4.50	4.00	3.75	3.25	3.00	2.75	2.75

* Lime recommendation to adjust pH as determined from soil test analysis.

Figure 3: CEC Chart

7. Fertilizer Labels

LANDSCAPE SUPPLY, INC.

southernLAWN **32-0-7 32% XRT**

"Late Fall Maintenance"

Guaranteed Analysis

Total Nitrogen (N)	32%
Urea Nitrogen	21.75%
Coated Slow Release	10.25%
Water Insoluble Nitrogen	0%
Water Soluble Nitrogen	0%
Ammoniacal Nitrogen	0%
Available Potash (P205)	0%
Soluble Potash (K20)	7%

Manufactured for:
Landscape Supply, Inc.
101 Madison Ave, NW
Roanoke, VA 24016

Net Weight: 50 lbs.

www.landscapesupplyva.com

LANDSCAPE SUPPLY, INC.

southernLAWN **14-20-14 30% XRT**

"Starter Formulation"

Guaranteed Analysis

Total Nitrogen (N)		14%
Urea Nitrogen	2%	
Coated Slow Release	4.2%	
Water Insoluble Nitrogen	0%	
Water Soluble Nitrogen	0%	
Ammoniacal Nitrogen	7.8%	
Available Potash (P205)		20%
Soluble Potash (K20)		14%

Manufactured for:
Landscape Supply, Inc.
101 Madison Ave, NW
Roanoke, VA 24016

Net Weight: 50 lbs.

16-3-8 50%XCU 20%Biosolids

15%AS 2%Fe 0.2%B 0.5%Zn Mn Mg Cu

GUARANTEED ANALYSIS

Total Nitrogen (N) 16.00%

3.90% Urea Nitrogen*

3.2% Ammoniacal Nitrogen

0.80% Water Insoluble Nitrogen

8.10% Slowly Available Water Soluble Nitrogen

Available Phosphate (P_2O_5) 3.00%

Soluble Potash (K_2O) 8.00%

Iron (Fe)..... 2.00%

Derived From: *8.00% slow release nitrogen derived from XCU

CONTAINS: EXCEPTIONAL QUALITY BIOSOLIDS

THIS FERTILIZER IS INTENDED ONLY FOR NONAGRICULTURAL USE ON (A) TURF DURING ITS FIRST GROWING SEASON (B) TURF BEING RENOVATED OR REPAIRED (C) OR WHERE A SOIL TEST INDICATES A PHOSPHOROUS DEFICIENCY

Net Weight 50 lbs (22.70 kg)

APPLY ONLY AS DIRECTED

MFG FOR LANDSCAPE SUPPLY, INC Roanoke, Va. 24016

By TIMAC USA, INC. Reading, Pa.

8. Soil Test Results

See attached files.