

Describing the nature of herbicide applications on school grounds in Maine.

Synopsis: BPC collected records from all applicators conducting herbicidal pesticide treatments on school grounds for 2020 and 2021. This document presents the data that were collected.

This document presents information on:

Application locations.....	2
Number of applications	3
Complete list of brand names of products used.....	3
Seasonality patterns	4
Time of day patterns.....	5
Size of area treated.....	6
Treated area types (sites) and target pests	9
Active ingredient names used.....	10
Total amount of active ingredients used	11
Methods of application.....	13
Products used but not registered in Maine	13

Methods: BPC identified applicators making herbicide applications to school grounds via a combination of email solicitation and reviewing school IPM records. Applicators were contacted via email and phone to collect their complete records sets for all applications made to school grounds in 2020 and 2021. Given that the initial call for records occurred in fall 2021, BPC returned to applicators in spring of 2022 to collect the remainder of the records through all of 2021. Additionally, the spring 2022 effort sought to clarify missing and erroneous data. Data presented here are simple summaries, no data has been removed as outliers and no statistics have been performed.

Application locations

There are 323 towns in Maine, and approximately five percent of them utilize herbicides as part of their weed management IPM strategy. Pesticide records were tallied by town, not school or school district (a town with three schools treated once in a year generated three records). All pesticide applications are included in this dataset, applications made under land management strategies that align with organic agricultural standards are included.

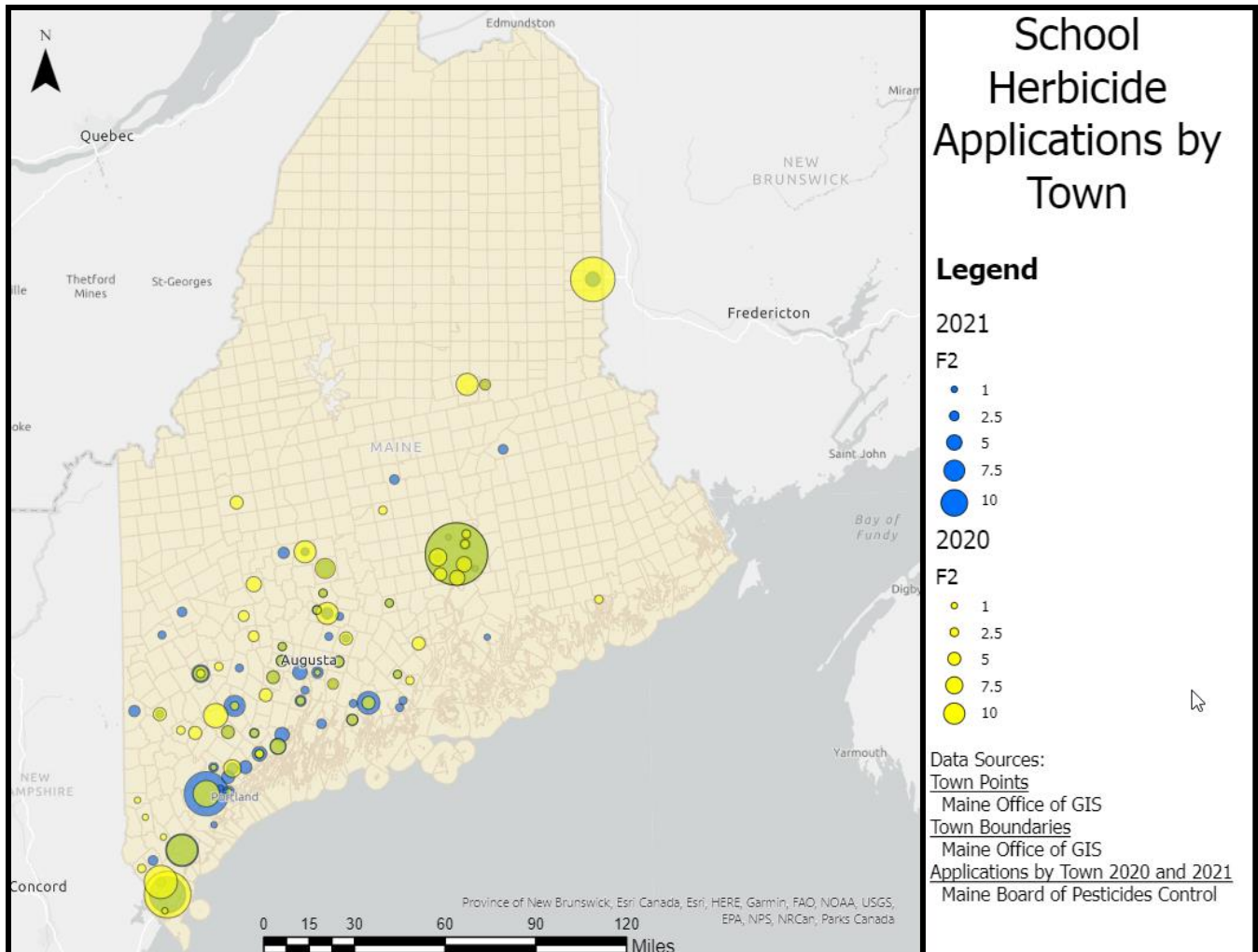


Figure 1. Location of Herbicide Applications By Town & Year. Yellow circles indicate applications made in 2020, blue circles indicate applications made in 2021, and green indicate when applications occurred in both years. Larger circles indicate more applications were made in that town.

Number of applications

This data set stems from 577 application records collected from 15 applicator companies for the years 2020 and 2021. In Maine, school herbicide treatments are performed by generalized turf companies, the schools themselves, as well as companies focused on school grounds. The different entities varied greatly in the number of products used, with a range of one product over two years up to 27 products. Likewise, the total pounds of product used by each company varied from 14 pounds over the two years up to 45,720 pounds.

Complete list of brand names of products used

Table 1. List of unique brand name products used over the 2020 and 2021 years by licensed applicators on school grounds.

12-24-12 Siduron	Dimension 19-0-06	Miramichi Pro Weed
13-0-5 Dimension + Acelepryn	Dimension 2EW	On Deck
17-0-5 w/Acelepryn and Dimension	Drive XLR8	Pendelton Aqua Cap
19-0-6 Dimension	Drive XLR8 herbicide	Pendulum Aqua Cap
19-0-6 w/Acelepryn and Dimension	Farmworks / Trimec 992	Q Ball
19-0-8 Dimension	Fiesta Organic	Q4
20-0-10 Gallery	Finale	Q4 Plus
22-0-6 w/ Dimension	Glyphosate	Quinway Plus
24-0-5 w/ Trimec	Homeplate	Round up Pro Max
28-0-3 Dimension + Acelepryn	Kleenup Pro	Roundup Pro
3 Way Select	Lesco 3-way	Roundup Pro / Trimec 992
4 Speed XT	Mad Dog	Speed Zone BRDLF Herb
4-Score	Mad Dog +	Speed Zone EW
Bandit 2F	Makaze	Sure Guard
Brushmaster	Makaze + Cide-Kick II	Surge
Chaser	Martin's Total Vegetation Control	Tenacity
Chaser 2	Mec Amine D	Trimec
Chaser 2 Amine	MEC AMINE-D	Trimec Classic Broadleaf Herbicide
Cheetah Pro	Mesotrione 21-22-4	Tri-Pac Select
Cornerstone Plus	Millennium Ultra2	Xonerate

Seasonality patterns

August is the month with the greatest number of herbicide applications being made to school grounds. Early spring and spring, while school is still in session, is the other primary timing of herbicide applications.

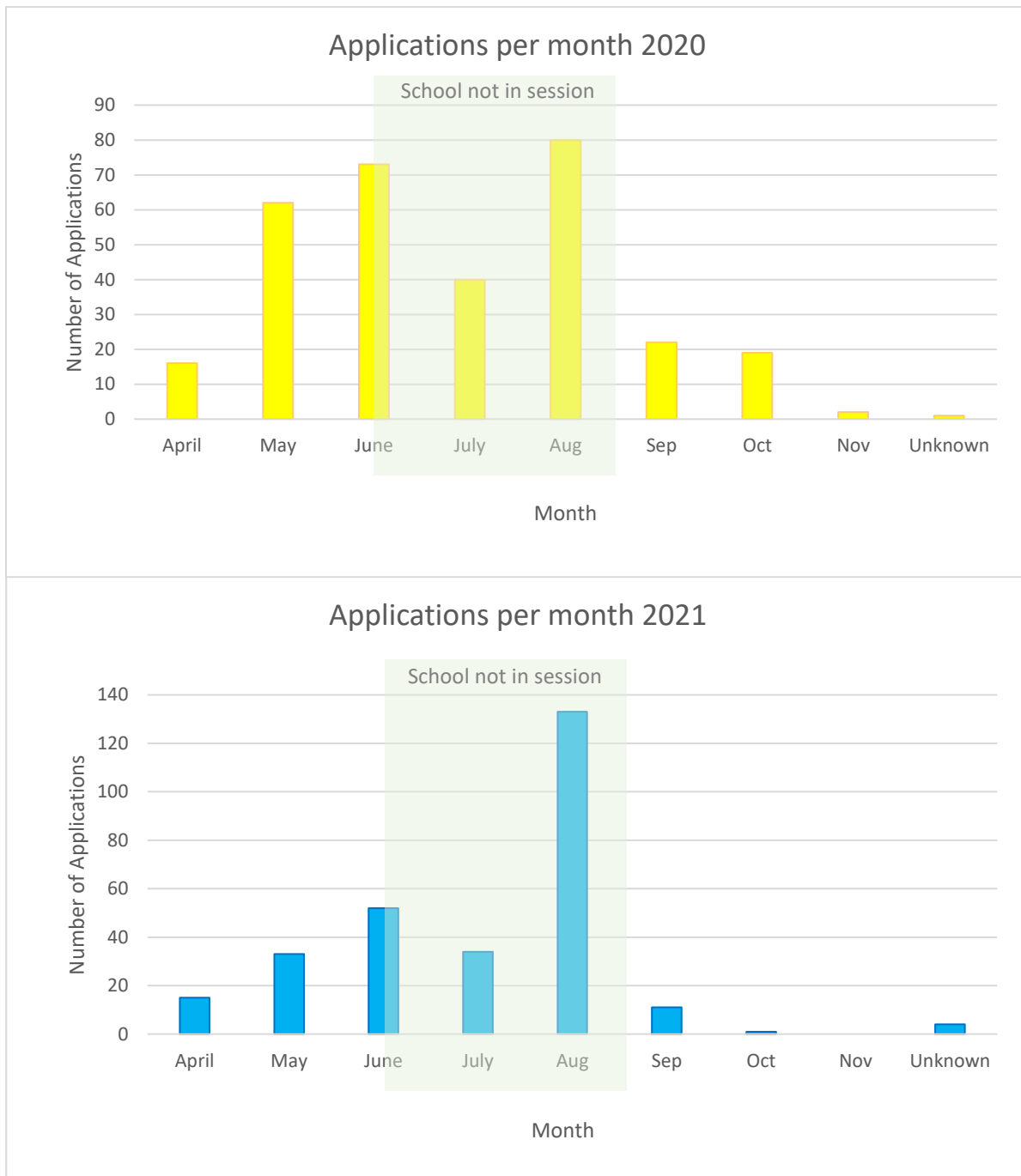


Figure 2. Herbicide applications made on school grounds by month of application in 2020 and 2021.

Time of day patterns

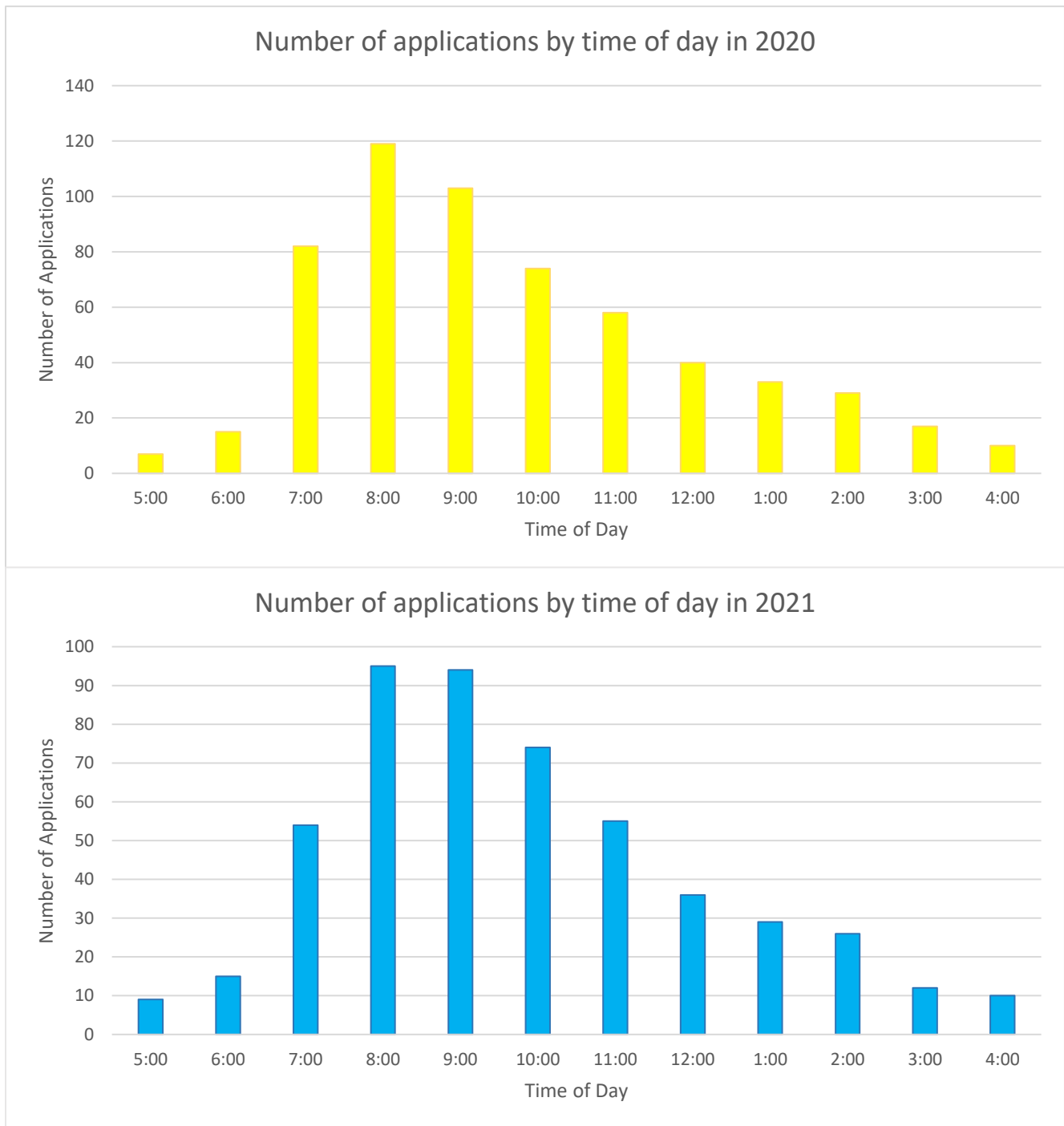


Figure 3. Herbicide applications made on school grounds by application time of day in 2020 and 2021.

Size of area treated

There were 60 unique herbicide brand name products used on school grounds over the 2020 to 2021 time period; and there were 77,216,030 total sq ft (1,773 acres) treated in that same time. Among herbicide products active ingredient mixtures are common. The top 15 products, by area treated, contain only 11 active ingredients in various mixtures ranging from one to four active ingredients per product. Below is a table of the top 15 brand name products and their respective amount of treated area. These 15 products represent 82% of all school grounds area treated.

Table 2. Top 15 brand name products used on school grounds in Maine, over the 2020 to 2021 period, as categorized by amount of land treated.

Product Brand Name	EPA Registration Number	Treated Area (sq ft)	Treated Area (acres)
Dimension 2EW	62719-542	24,687,008	567
Chaser	34704-928	10,381,847	238
Pendulum Aqua Cap	241-416	3,998,502	92
Speed Zone	2217-833	3,524,004	81
22-0-6 w/ Dimension	62719-504-961	3,502,224	80
13-0-5 w/ Acelepryn + Dimension	961-427	2,872,000	66
Chaser 2 Amine	34704-930	2,232,450	51
Mad Dog +	34704-890	2,136,550	49
Mec Amine D	100-1489	1,887,166	43
Q Ball	34704-239	1,785,960	41
Q4	228-744	1,742,400	40
Lesco 3-way	2217-930	1,437,480	33
Finale	10404-43	1,228,036	28
Roundup Pro	432-1229	1,132,560	26
Speed Zone BRDLF Herb	2217-833	986,634	23

The pesticide labels of the top 15 products were examined to determine what active ingredients were in use. The specific breakdown of each product is in Table 1. Looking at use patterns from the perspective of how many acres received each specific active ingredient is available in Figure 4. This percent breakdown shows that dithiopyr, 2,4-D, and triclopyr are spread widely on school grounds. Dithiopyr is a pre-emergent used for crabgrass control. 2,4-D is a systemic that controls broadleaf weeds. Triclopyr is a systemic that is both for broadleaf and woody weeds. From an area-treated perspective, it makes sense that the compounds found to be widely used are the ones used for applications to the whole field surface vs the smaller volumes used in response to smaller areas like fence lines.

Table 3. Percent active ingredients contained in the top 15 most commonly used brand name products, when ranked by treated area, used on school grounds over the 2020 to 2021 period.

PRODUCT BRAND NAME:	CONTAINS THE FOLLOWING ACTIVE INGREDIENTS:			
DIMENSION 2EW	Dithiopyr (24%)			
CHASER	Triclopyr (16.5%)	2,4-D (34.4%)		
PENDULUM AQUA CAP	Pendimethalin (38.7%)			
SPEEDZONE	2,4-D (28.6%)	Mecoprop-P (5.9%)	Dicamba (1.7%)	Carfentrazone Ethyl (0.6%)
22-0-6 W/ DIMENSION	Dithiopyr (0.2%)			
13-0-5 W/ ACELEPRYN + DIMENSION	{Chlorantraniliprole}* Dithiopyr (0.2%)			
CHASER 2 AMINE	2,4-D (34.2%)	Triclopyr (15.2%)		
MAD DOG +	Glyphosate (41%)			
MEC AMINE D	2,4-D (30.6%)	Mecoprop-P (8.2%)	Dicamba (2.8%)	
Q BALL	Quinclorac (18.9%)			
Q4	Dicamba (1.5%)	2,4-D (11.8%)	Quinclorac (8.4%)	Sulfentrazone (0.7%)
LESCO 3-WAY	2,4,D (30.6%)	Mecoprop-P (8.2%)	Dicamba (2.8%)	
FINALE	Glufosinate (11.3%)			
ROUNDUP PRO	Glyphosate (48.7%)			
SPEED ZONE BRDLF HERB	2,4-D (28.6%)	Mecoprop-P (5.9%)	Dicamba (1.7%)	Carfentrazone Ethyl (0.6%)

***Not an herbicide**

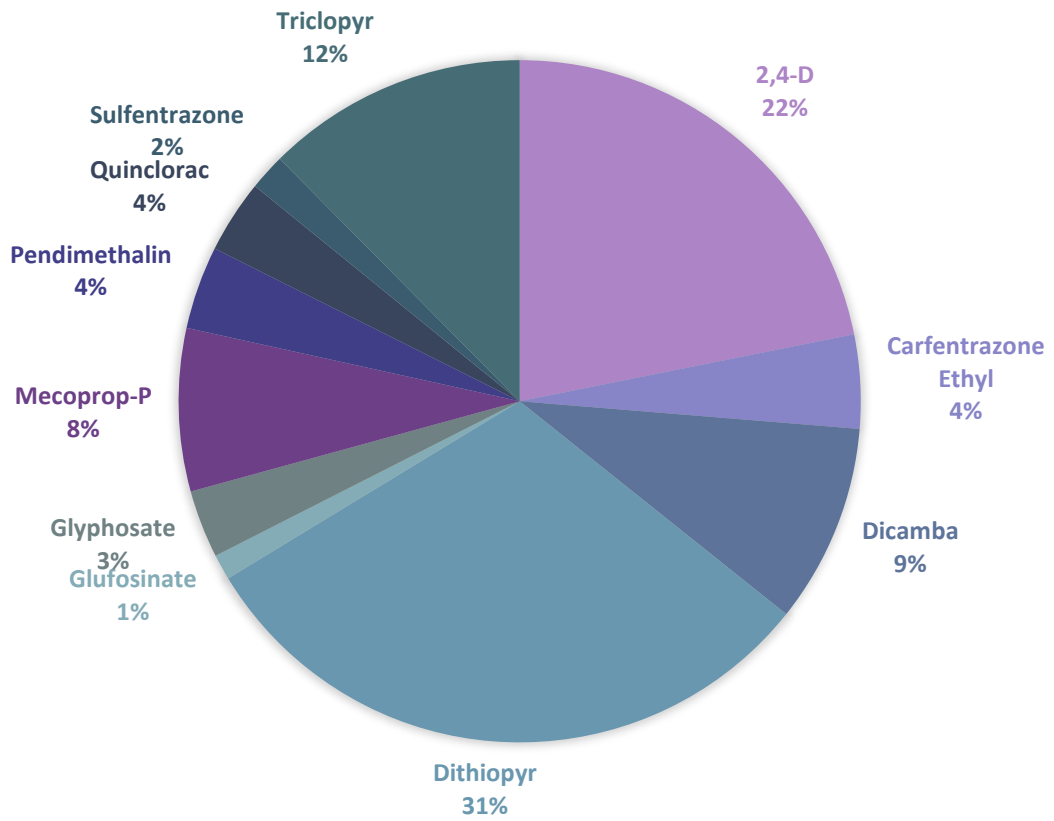


Figure 4. Relative use of active ingredients from the top 15 most commonly used products categorized by amount of school ground land treated over the 2020 to 2021 period.

Treated area types (sites) and target pests

As part of the records required to kept for each application, applicators record the *Site* and *Pest*. Site is jargon in pesticide regulation that indicates the crops on which the pesticide will be used and/or where the product will be used, for example, a building, car, or fence. The records submitted to BPC do not require standardized response language, instead applicators are free to record site and pest as they deem appropriate. The following lists are translations of the records received describing site and pest for school ground applications. To create this list redundancies were removed, specific school names were removed, and abbreviations were spelled out. The two years' worth of data are combined.

Table 4. Listing of all sites recorded by applicators on school grounds in 2020 and 2021.

Athletic fields	Front lawn	Middle School Drip Edges	School fields and lawns
Banking Around Field	High School bullpens, jumping pits	Middle School Field Hockey	School Grounds
Baseball Infields	High School campus, lawns, athletic fields	Middle School Practice Field	School Grounds
Baseball, Softball	High School Football	Middle School Soccer	School Kickball
Bleachers	High School Practice mounds, shot put, discus	Middle School Softball Infields	Shot Put Fence
Brick area in front of school	High School shotput	Parking lot cracks, and curbing	Shotput
Courtyards	High School Softball Infields	Parking lot curbing	Skin portion of baseball field/dirt & turf
Elementary softball infields	High School walking path	Parking lot curbing and cracks	Soccer field
Fencelines	Jumping Pits	Parking lot curbing and cracks	Soccer field turf
Field Hockey	Lawns	Pee Wee football	Softball Infields
Field Hockey Fence	Lightwell Courtyards	Playground	Tennis Court Fence
Field(s)	Little League Field	Playground ballfield	Track
F-lines, bat cage, disc, dugouts	Little League infield dirt/turf area	Playground Edges	Turf
Football	Middle School Athletic Fields	Practice FB	Warning track
Football bleachers and rip-rap	Middle School Baseball Infields	Practice Field	

Table 5. Listing of all pests recorded by applicators on school grounds in 2020 and 2021.

Bare ground	Knotweed
Broadleaf weeds	Monocots
Crabgrass	Poison Ivy
Dicots	Weed grasses
Fertilizer and weed control	Weeds
Grass	

Active ingredient names used

Table 6. List of all active ingredients included in herbicide products used on school grounds by licensed applicators in 2020 and 2021.

2,4-D
2,4-DP
Amicarbazone
Ammonium nonanoate
Caprylic Acid
Carfentrazone Ethyl
Clopyralid
Dicamba
Dithiopyr
Flumioxazin
Glufosinate-Ammonium
Glyphosate
Imazapyr
Iron Fe-Hedta
Isoxaben
Mecoprop
Mesotrione
Pendimethalin
Pyraflufen Ethyl
Quinclorac
Siduron
Sulfentrazone
Triclopyr

Total amount of active ingredients used

Products were ranked by total weight to better understand use patterns. The top 14 products weigh a total of 77,658 lbs. These top products were then further evaluated to tally the weight of each of the active ingredients. Total active ingredient weight used here is a combination of dry weight pounds combined with gallons. Gallons are converted to pounds by using a generic density factor of 10 pounds of product for each gallon used. Eight active ingredients were identified as coming from the 14 products. This subsampling down to 14 products was done to reduce the data processing time taken while still maintaining integrity of the data summary. These top 14 products represent a majority (94%) of the products used over the 2020 and 2021 time periods.

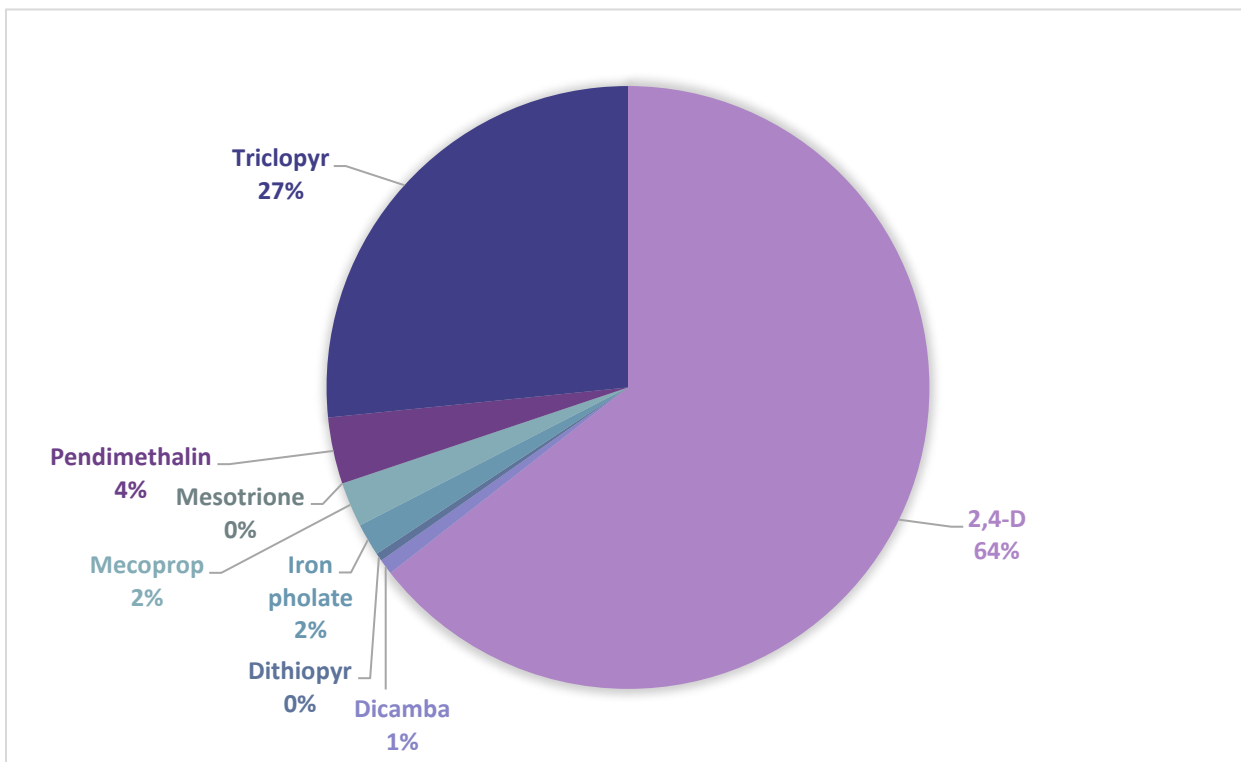


Figure 5. Weight of active ingredients from the most commonly used products reported in 2020 and 2021. These eight active ingredients are frequently used in combinations with one another into 14 unique products.

Table 7. Display of top 14 products used on school grounds as listed by active ingredient, weight, and associated brand name product

ACTIVE INGREDIENT	ACTIVE INGREDIENT WEIGHT (LBS)	ASSOCIATED BRAND NAMES
2,4-D	10,318	Chaser, Speed Zone, Mec Amine D, Q4, 24-0-5 w/Trimec, Lesco 3-Way
DICAMBA	131	Speed Zone, Lesco 3-Way, Q4, Mec Amine D
DITHIOPYR	68	Dimension 2EW, 13-0-5 w/ Acelepryn + Dimension, 17-0-5 w/ Acelepryn + Dimension, 19-0-6 w/ Acelepryn + Dimension, 28-0-3 w/ Acelepryn + Dimension, 19-0-6 w/Dimension, 19-0-8 w/Dimention, 22-0-6 w/ Dimension
IRON PHOLATE	278	Fiesta Organic
MECOPROP	385	Speed Zone, Mec Amine D, Lesco 3-Way
MESOTRIONE	1	Fertilizer with 0.08% Mesotrione
PENDIMETHALIN	571	Pendulum Aqua Cap
TRICLOPYR	4,257	Chaser
TOTAL	16,009	

Methods of application

Table 8. Listed methods of application by applicators applying herbicides on school grounds in 2020 and 2021.

Backpack sprayer
Backpack wand
Battery sprayer
Boom + hand/spot spray
Boom and backpack sprayer
Boom sprayer
Boom sprayer (Spot Treat)
FMC Boom Sprayer
Granular/LELY rotary spreader
Hand spreader
Hand sprayer
Hand tank wand
Hand/spot spray
Hardi-sprayer
Permagreen spray bar
Ride-on sprayer
Ride-on spreader
Tractor/vicon
Vicon spreader
Wand hand tank

Products used but not registered in Maine

During initial review of the submitted records, several labels were forwarded to the pesticides registrar and manager of compliance for review of the labeled sites against the reported application sites.

As follow-up to the discussion on improper use of herbicides on school grounds, two notice of warnings (NOW) were issued by BPC inspection staff.

- An NOW was also issued to RSU 29 IPM Coordinator/Commercial applicator for application of Farmworks 53.8% Glyphosate (EPA Reg. No. 84009-30), not labeled for school grounds. This application was made prior to the glyphosate ban on school grounds.
- A NOW to Mount Desert Island Schools on 4/6/2022 for use of Acclaim Extra (EPA Reg. No. 432-950) and Green Crabgrass Preventer 18-0-6 w/ .29% Cavalcade (Prodiamine) (EPA Reg. No. 60063-41-534), not labeled for school grounds.