

Chapter 2. General Style Conventions

This manual should be used as a primary source for conventions and style in all ASA, CSSA, and SSSA publications. Other style manuals supplement this manual, including *Scientific Style and Format* (CSE, 2006), the *ACS Style Guide* (Coghill & Garson, 2006), and the *US Government Printing Office Style Manual, 2008* (USGPO, 2008). Authors are also encouraged to look at recent articles in ASA, CSSA, and SSSA journals for the general style and format used.

This chapter addresses a few of the more common or troublesome questions of style in terms of ASA, CSSA, and SSSA publication requirements and guidelines. It only incidentally covers English grammar, style, and usage.

To improve the quality of your writing, consult this manual and any of the excellent books available that cover grammar, punctuation, and other points of English usage (APA, 2020; UCP, 2017). The *ACS Style Guide* (Coghill & Garson, 2006) and *Scientific Style and Format* (CSE, 2006) address scientific writing and usage in general and provide detailed guidelines and examples within the sciences.

Strategies for eliminating awkwardness and cumbersome constructions include writing short, declarative sentences; keeping subjects and verbs as close together as possible; and, given a choice, selecting shorter and simpler rather than longer words (try vs. endeavor, show vs. demonstrate). In addition, a sentence recast in the active voice is often both shorter and clearer than the passive form.

ABBREVIATIONS AND SYMBOLS

Define abbreviations at first mention in the abstract and main text and again in the tables and figures. Provide an alphabetical list of abbreviations, placed after the abstract. The common abbreviations in Table 2–1 do not need definition, nor do SI units (Chapter 7) or chemical element symbols. For commonly used abbreviations and statistics that do not need definition, see Table 4–1.

Rules for abbreviating and lists of many accepted abbreviations and acronyms are given in *Scientific Style and Format* (CSE, 2006, p. 135–140) and in the *ACS Style Guide* (Coghill & Garson, 2006, Chapter 10). Acronyms do not have periods; nor do SI unit symbols. Abbreviations may or may not have periods.

Use abbreviations sparingly. If you do abbreviate, use a standard abbreviation rather than making up one specific to your paper. If you must devise an abbreviation, use letter groups that are not already familiar abbreviations for other phrases, that are not identical to units of measure, and that will not be confused with an element symbol. (For example, do not abbreviate leaf appearance interval as LAI, even if you are not going to discuss leaf area index).

Additional useful points are as follows.

- In a full date (format: month day, year), spell out the month. Always abbreviate the month in references and tables. (See also Chapter 7.)
- In a series of measurements, give the unit(s) at the end (e.g., 2–10°C; 5, 10, and 20 kg ha⁻¹).
- The symbol % is used with numerals. Unlike with other units, the symbol is repeated with each number in a range or series (e.g., 10%–20%) . Do not use the word *percent* with a numeral.
- Use United States as a noun. Use the abbreviation "US" for United States as an adjective (e.g., US Cotton Belt). You may use "USA" as a noun in tables and titles.

TABLE 2-1 These common abbreviations do not need definition. Use may be restricted to use in tables and figures (T) or with numeric values (N). For statistics symbols and abbreviations, see Table 4-1. For other unit symbols, see the tables in Chapter 7.

Abbr.	Meaning (restriction)	Abbr.	Meaning (restriction)
a.i.	active ingredient	GIS	geographical information system
asl	above sea level (N)	GPS	global positioning system
avg.	average (T)	h	hour (N)
BCE	before common era	i.d.	inside diameter (N)
bp	base pair	max.	maximum (T)
CE	common era	min	minute (N)
CI	Cereal Investigation [number] ^a	min.	minimum (T)
cM	centimorgan	no.	number
coef.	coefficient (T)	o.d.	outside diameter (N)
conc.	concentration (T)	PI	Plant Introduction, Plant Identification [no.]
Da	dalton	s	second (N)
diam.	diameter (N,T)	sp., spp.	species
DNA	deoxyribonucleic acid	v/v	volume per volume
dry wt.	dry weight (N,T)	vs.	versus
Exp.	experiment (N)	w/v	weight per volume
fresh wt.	fresh weight (N,T)	w/w	weight per weight
g	gravity constant		
ARS	Agricultural Research Service		
EU	European Union		
NASA	National Aeronautics and Space Administration		
NOAA	National Oceanic and Atmospheric Administration		
NRCS	Natural Resources Conservation Service		
USDA	United States Department of Agriculture		
USDOE	United States Department of Energy		
USEPA	United States Environmental Protection Agency		
USGS	United States Geological Survey		

^a The CI must be followed by a two-letter abbreviation for the applicable cereal genus: *Clav* for oat, *Clho* for barley (*Hordeum*), *Cltr* for wheat (*Triticum*), etc.

- Abbreviate the names of states, provinces, and territories when following a city name, using the US postal abbreviations (Table 2-2). Otherwise, spell out place names in full.
- Use the abbreviations "lat" and "long" with geographical coordinates (e.g., 30° N lat; 89°24'04" N lat; 30° W long). Omit the abbreviations when both coordinates are given (12°39' N, 8°00' W; 27°33'00" S, 151°58'00" E). Decimal degrees are allowed.

SPELLING AND CAPITALIZATION

Merriam-Webster's Collegiate Dictionary (Merriam-Webster, 2019) is the dictionary used by ASA, CSSA, and SSSA editing staff regarding spelling, capitalization, and compound terms. Whichever your dictionary, use American spelling instead of British, except in quotations and reference titles, and choose the first spelling of a word.

The *Chicago Manual of Style* and the CSE style manual contain chapters on distinctive treatment of words, including hyphenation and compounds (UCP, 2017, Chapter 7; CSE, 2006, Chapter 6). The *ACS Style Guide* (Coghill & Garson, 2006) has several helpful lists, including the spelling, abbreviation, and presentation of chemical elements and compounds. An additional resource for specialized terms in the physical and life sciences

TABLE 2–2 Postal abbreviations for states, provinces, and territories in USA, Canada, and Australia.

Area	Abbrev.	Area	Abbrev.
United States			
Alabama	AL	Montana	MT
Alaska	AK	Nebraska	NE
Arizona	AZ	Nevada	NV
Arkansas	AR	New Hampshire	NH
California	CA	New Jersey	NJ
Colorado	CO	New Mexico	NM
Connecticut	CT	New York	NY
Delaware	DE	North Carolina	NC
District of Columbia	DC	North Dakota	ND
Florida	FL	Ohio	OH
Georgia	GA	Oklahoma	OK
Hawaii	HI	Oregon	OR
Idaho	ID	Pennsylvania	PA
Illinois	IL	Puerto Rico	PR
Indiana	IN	Rhode Island	RI
Iowa	IA	South Carolina	SC
Kansas	KS	South Dakota	SD
Kentucky	KY	Tennessee	TN
Louisiana	LA	Texas	TX
Maine	ME	Utah	UT
Maryland	MD	Vermont	VT
Massachusetts	MA	Virginia	VA
Michigan	MI	Washington	WA
Minnesota	MN	West Virginia	WV
Mississippi	MS	Wisconsin	WI
Missouri	MO	Wyoming	WY
Canada			
Alberta	AB	Nunavut	NU
British Columbia	BC	Ontario	ON
Manitoba	MB	Prince Edward Island	PE
New Brunswick	NB	Quebec	QC
Newfoundland and Labrador	NL	Saskatchewan	SK
Northwest Territories	NT	Yukon Territory	YT
Nova Scotia	NS		
Australia			
Australian Capital Territory (Canberra)	ACT	South Australia	SA
New South Wales	NSW	Tasmania	TAS
Northern Territory	NT	Victoria	VIC
Queensland	QLD	Western Australia	WA

is the *New Oxford Dictionary for Scientific Writers and Editors* (Martin, 2009). This book is not primarily a dictionary of definitions but of usage and style.

The first letter is capitalized in the following cases:

- Regions, sections, or groups of sites commonly associated together (e.g., Corn Belt, the Midwest, the South, the West). Do not capitalize the adjectival form (e.g.,

midwestern practices, southern states, western Texas). Note the following distinction: the southeastern United States, but the US Southeast.

- The first letter of genus and all higher taxa (e.g., family and order), but not lower taxa (specific name or epithet, subspecies, variety).
- Trademarked names. Trademarks are adjectives and must modify a generic noun. It is a misuse of a trademark to pluralize it or to derive a verb or noun from it. For ASA, CSSA, and SSSA publications, omit the various trademark symbols, such as ® and ™.
- Words specified by number, and so treated as proper nouns (e.g., Treatment 1, Day 2, Exp. 3, Year 4, No. 5 [but Paper no. 6]). Exceptions may apply within special fields (e.g., chromosome 6 and metaphase I).
- The first word after a colon if the colon introduces a quotation, a complete sentence, or a direct question.
- Any title of office immediately preceding a name (SSSA President Jane Smith). Do not capitalize titles standing alone (e.g., the SSSA president was elected).

If a chemical name to be capitalized (as in titles, or beginning a sentence) begins with a Greek letter, a numeral, or a prefix in italics or small capitals, leave that unchanged and capitalize the next letter. EXAMPLES: β -1-4-Glucose, *p*-Coumaric acid, and *D*-Glyceraldehyde.

Words derived from proper names but now in common usage tend not to be capitalized (e.g., paris green, bunsen burner, petri dish; but Erlenmeyer flask). Common names, races, and market types of crops are not capitalized, even if the name comes from a proper noun (e.g., bermudagrass, japonica rice, pima cotton, spanish peanut, sudangrass).

Months and days of the week are capitalized; seasons are not.

PUNCTUATION

The standard rules of punctuation are adequate for all ASA, CSSA, and SSSA publications. The APA and ACS style manuals (APA, 2020; Coghill & Garson, 2006) treat punctuation clearly and comprehensively.

The following rules address usages that often give authors trouble.

Commas

- Use a comma before "and" or "or" in a series of three or more items (the so-called Oxford, or series, comma). EXAMPLES: "0.8, 2.1, and 3.9 kg ha⁻¹"; "shoot biomass, root biomass, leaf blade or leaflet length and width, and plant height."
- Commas and periods come before a closing quotation mark, an asterisk, or a superscripted footnote number; semicolons and colons come after. Do not double periods at the end of a quotation: "Once is enough."

Lists

- Use a semicolon to separate a series of items within a list if any one of them includes a comma. EXAMPLE: Treatments in the second fertilizer study were rates of 56, 112, and 448 kg ha⁻¹ N; 25 and 49 kg ha⁻¹ P; and 47, 93, 139, 186, and 279 kg ha⁻¹ K.
- Punctuation in display lists (where each item starts on a new line) depends on the content and context. Use no period if all are short, independent phrases. If any one of the items is a complete sentence, end each item with a period. If the list is functionally part of the introductory sentence, punctuate with commas or semicolons and a final period, just as you would if the sentence had no line breaks.
- For display lists, bullets or arabic numbers (1, 2, 3, etc.) followed by a period for each item are preferred. For run-in lists in text, lowercase letters (a, b, c, etc.) in parentheses are preferred, although numbers are acceptable.

Brackets

- For parentheses within parentheses, substitute square brackets for the inner pair. EXAMPLE: "(Lloyd-Jones, 1873 [as cited by Andrews, 1996])." Two exceptions in prose are required in ASA, CSSA, and SSSA publications:
 - Use brackets to enclose scientific names that already contain parentheses, as in "soybean [*Glycine max* (L.) Merr.] was. . . ." Alternatively, use commas: "soybean, *Glycine max* (L.) Merr., was. . . ."
 - For mathematical usage, fences are used in the order $\{[()]\}$. See Chapter 7.

COMPOUND WORDS AND DERIVATIVES

Hyphens, Spaces, and Dashes

A word containing a prefix, suffix, or combining form is a derivative and is most often written as one word. Compound words used to express an idea different from that expressed by the separate parts are usually written as one word. Hyphens and en-dashes are used to avoid a confusing sequence of letters, a confusing sequence of adjectives, a jumble of ideas, or possible confusion with a word of the same spelling without the hyphen (e.g., co-op, as distinct from coop). Comprehensive rules for compounds are found in the *Chicago Manual of Style* (UCP, 2017) and *Scientific Style and Format* (CSE, 2006).

Most compounds and derivatives fall under these general rules:

Hyphens

- Derivatives are usually written as one word. EXAMPLES: antiquality, clockwise, fourfold (but 10-fold or 1.5-fold), nonadditives, nonsignificant, postdoctoral, preemergent, reuse, shortwave.
- Use hyphens with prefixes to words that begin with a capital letter and in a few awkward combinations that bring like vowels together. EXAMPLES: un-American, semi-independent.
- Hyphenate a compound adjective when used before, but not after, the word it modifies. EXAMPLE: a winter-hardy plant; the plant is winter hardy.
- Use a hyphen after a prefix to a hyphenated adjective. EXAMPLES: semi-winter-hardy plant, non-winter-hardy plant.
- Use a hyphen in a compound adjective that includes a number. EXAMPLES: 10-year-old field, 6-kg samples, 4-mm depth.
- Hyphenate compound modifiers starting with the adverb "well," except when another adverb precedes it. EXAMPLE: well-known method, but very well known method.
- Do not use a hyphen after an adverb formed by adding "-ly" to an adjective. EXAMPLE: an intensively cultivated hillside.
- Use a hyphen for compound adjectival expressions as needed for clarity (e.g., "on a per-gram basis," "winter-grown cereals," but "low molecular weight substance").
- Use hyphens to join numbers and prefixes in chemical names (e.g., *trans*-2-bromocyclopentanol). For exceptions, see the *ACS Style Guide* (Coghill & Garson, 2006, Chapter 12).

En-dashes

- Use an en-dash instead of a hyphen in a compound or prefixed adjective that has a phrase in one of its parts (and the phrase cannot be hyphenated). EXAMPLES: "*Avena sterilis*–derived resistance genes"; "pre–Civil War surveys."
- Use an en-dash instead of a hyphen after a superscript or subscript. EXAMPLES: F₃–derived; NO₃–N (but "nitrate N" when spelled out).

- Use an en-dash between joined nouns of equal importance. EXAMPLES: Webster–Nicollet soil complex; oxidation–reduction potential; Waller–Duncan *k* ratio; corn–soybean rotation; Fusarium wilt–root-knot nematode complex.
- As a specialized instance of the previous rule, use an en-dash between two chemical compounds (e.g., HCl–H₂SO₄).
- Use an en-dash to indicate a range of numbers. EXAMPLES: "p. 23–49."; "*Plant Disease*, 66, 172–176"; ; "during the final study years (1997–1999)," "the 1999–2000 winter wheat growing season". EXCEPTION: If either of the numbers is negative, or is otherwise modified, use the word "to" instead of the dash. EXAMPLES: "(0% to ≤5%)" or "(–5 to 10°C)".

If you cannot distinguish hyphens from en-dashes in your manuscript, use hyphens throughout. The copyeditor will convert as necessary.

MISCELLANEOUS POINTS OF USAGE

The following entries address common difficulties in scientific usage.

Affect vs. effect (*verb*). "To affect" means to act upon something that already exists; "to effect" means to bring some thing or condition into existence.

Affect vs. effect vs. impact (*noun*). An "effect" is a result or outcome; an "affect" is an emotion (the term is used chiefly in psychology); an "impact" is a collision, the force of a collision, or (by extension) a major effect. That is, "impact" is not a neutral equivalent of "effect."

Alternate vs. alternative. Use "alternate" to mean occurring or following by turns, or alternating in time or space—first one, then the other. Use "alternative" for one of two or more mutually exclusive possibilities.

Between vs. among (*prep.*). Use "between" for two entities, "among" for more than two.

British spelling. Except in references and quotations, change British to American spelling (e.g., "analyse" to "analyze"; "behaviour" to "behavior"; "grey" to "gray"; "modelled" to "modeled").

cf. (Latin *confero*, compare). Use "cf." sparingly, to mean "see, for a contrasting view." For scientific writing, the English "see" and "compare" are preferable.

Compare to vs. compare with (*verb* + *prep.*). Use "compare to" for overall likenesses and contrasts and for subjective, qualitative comparisons ("Shall I compare thee to a summer day?" [Shakespeare, Sonnet 18]). Use "compare with" for objective, quantitative comparisons (e.g., the results of the low-P treatment were compared with those of the high-P treatment). Also, do not be afraid to simplify "more ... compared with" to "more ... than" (e.g., "more biomass at the second harvest than the first" instead of "more biomass at the second harvest compared with the first").

e.g. (Latin *exempli gratia*, for example) vs. i.e. (Latin *id est*, that is). Use "e.g." to mean "for example"; use "i.e." to mean "that is." Use the abbreviated forms only in parentheses; otherwise, use the English words.

Ensure vs. insure (*verb*). Use "ensure" to mean "make certain that a desired outcome occurs." Use "insure" to mean "protect" against monetary loss (as in an insurance policy).

Further vs. farther (*adj. or adv.*). "Further" means in addition or to a greater extent; "farther" implies distance in space or time.

Geographical names. Use common English equivalents of place names where such exist (e.g., Rome, not Roma; Munich, not München; Mexico City, not México; but Buenos Aires, Beijing).

Percent vs. percentage vs. percentage point. "Percent" is used with numeric values and is spelled out only at the beginning of a sentence. "Percentage" describes such a value and is always spelled out. "Percentage point" is used with numeric values and refers to a step of 1% in a percentage value; it is treated as a word, not a unit, and so is not abbreviated. EXAMPLES: "Grain fill was 20%"; "Nine percent of the plants"; "the percentage of grain fill"; "was reduced by 1.2 percentage points."

Restrictive and nonrestrictive clauses (*that; which*). Generally, "that" introduces a restrictive clause, one that gives information essential to the meaning of the sentence. Example: "Only soil samples that contained >30% clay were tested." If in such sentences the restrictive "that" clause were omitted, essential meaning would be lost.

"Which" introduces a nonrestrictive clause, one that gives only incidental, supplemental information. EXAMPLE: "The rejected samples, which received no further treatment, were stored for use in a separate study." If in such a sentence the nonrestrictive "which" clause were removed, the basic statement remains.

We suggest following a simple rule: Use "that" with no preceding comma when the added phrase is restrictive; use "which" with a preceding comma when the added phrase is nonrestrictive.

Subject–verb agreement. The cause for errors in subject–verb agreement is often confusion about the number of the subject. Two singular nouns joined by "and" require a plural verb unless the two nouns function as a single entity (e.g., "research and development"). When two or more nouns are joined by "or," the verb takes the number of the closest subject. Collective nouns take a singular verb when the group as a whole is meant (usually preceded by "the") (e.g., "The series of experiments was...."; "A series of experiments were....").

Units of measure should be treated as collective nouns that take a singular verb:

- Six milliliters of the solution was....
- After 3 h, 6 mL of the solution was....

Use vs. employ (*verb*). "Use" is the simpler word, and neutral. "Employ" carries additional connotations, as of advantageous use or hiring for wages.

Use vs. utilize (*verb*). The meanings are not identical. Use "utilize" (meaning "to turn to practical use") only to indicate that some unexpected use was found for an object or procedure ("kerosene tins utilized as champagne glasses").

Words of foreign origin. Foreign words in common usage in English and that appear in the main section of *Merriam-Webster's Collegiate Dictionary* (e.g., ad hoc, a priori, et al., in situ, in vitro, in vivo, per se, vice versa, and vs.) are considered to have been incorporated into the language. They are thus considered English words and are set in roman type, not italic. Do not hyphenate such foreign words, even in adjectival position.

/ (*slash or solidus*). With a few exceptions (e.g., and/or), it is best to reserve the slash for mathematical division and ratios. To express a combination of ideas, "and" or "or" can usually be substituted for the slash. EXAMPLE: For phrase "Appearance of collar/ligule of

first leaf," change the wording to "collar or ligule," "collar and ligule," or "collar and/or ligule."

DATES

In running text, capitalize and spell out the names of days and months. For complete dates, give the month, day (one or two digits), and year (four digits), e.g., August 1, 2023. Abbreviate names of months and days of the week in tables and references. Standard abbreviations for months are Jan., Feb., Mar., Apr., Aug., Sept., Oct., Nov., and Dec.; May, June, and July are not abbreviated.

Dates may also be identified as day of the year (i.e., in the year's sequence of 365 or 366 days), thus: Day of Year 235. Its typical abbreviation (DOY) should be defined at first use. Note that *Julian day* does not mean day of the year. A Julian day describes a date in terms of days elapsed since Greenwich noon on January 1, 4713 BC. Julian dates are used primarily in astronomy, information science, and space science.

GREEK LETTERS

The Greek alphabet, showing both uppercase and lowercase letters, is given below. Modifications of a few of these letters may be acceptable, but the ones given here should be used insofar as possible.

	Upper case	Lower case		Upper case	Lower case		Upper case	Lower case
alpha	A	α	iota	I	ι	rho	Ρ	ρ
beta	B	β	kappa	K	κ	sigma	Σ	σ, ς
gamma	Γ	γ	lambda	Λ	λ	tau	Τ	τ
delta	Δ	δ	mu	Μ	μ	upsilon	Υ	υ
epsilon	Ε	ε	nu	Ν	ν	phi	Φ	φ, ϕ
zeta	Ζ	ζ	xi	Ξ	ξ	chi	Χ	χ
eta	Η	η	omicron	Ο	ο	psi	Ψ	ψ
theta	Θ	θ, ϑ	pi	Π	π	omega	Ω	ω