AI assisted analysis: Key points

What are the most common environmental/abiotic problems that you saw this year? (e.g. Iron chlorosis on maple; Recycled water issues on spruce)

Big Picture Takeaways

1. **Water stress (too little, too much, poorly timed) is the dominant abiotic issue affecting nearly every species.**
2. **High pH–related chlorosis is strongly patterned and predictable by species**, especially maple, aspen, and birch.
3. **Spruce is disproportionately represented across multiple abiotic stress categories**
4. **Planting and establishment errors are a major, correctable contributor** that worsen all other stresses.
5. Many reported "decline" symptoms likely represent **cumulative abiotic stress**, not isolated problems.

Water Stress (mainly underwatering, some overwatering) Is the Dominant Abiotic Driver (by far)

When combined, the following issues clearly fall into a **single overarching category**:

- *Water, lack of*
- *Water stress*
- *Poor irrigation practices*
- *Overwatering*
- *Budget-driven reduced irrigation*
- *Flooding*
- *Poor drainage / clay soils*
- *Winter desiccation*

Nearly all tree species are listed under at least one water-related stressor, making water the most universal abiotic limitation.

Species Patterns

- **Spruce (especially blue spruce)** and **pine** appear repeatedly under:
    - Drought stress
    - Winter desiccation
    - Poor irrigation practices
- **Cottonwood, poplar, and aspen** show up under both:
    - Too little water (drought)
    - Too much water (poor drainage, fungal root rot)

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2. Soil Chemistry & Structure Problems Cluster Together

The following issues are best combined:

- Iron chlorosis
- High pH soils
- Hard water
- Nutrient deficiency / nitrogen deficiency
- Soil compaction
- “Soil” (general)

Iron chlorosis is the single most frequently cited individual abiotic issue, and it is strongly associated with a predictable set of species.

Most Affected Species

- **Maple** (including multiple maple types)
- **Aspen**
- **Birch**
- **Fruit trees**
- **Oak**

- **Lilac**
- **Cottonwood & ash** (less frequently)

Interpretation

- The species list strongly matches **high-pH–sensitive trees**, indicating:
    - Calcareous soils
    - Alkaline irrigation water
    - Limited species–site matching
- Repeated listing of "various" and "most trees" suggests **widespread site-level soil constraints**, not isolated cases.

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3. Improper Planting & Establishment

These issues clearly belong together:

- Planting incorrectly
- Planting too deep
- Root problems
- Mechanical injury
- Vandalism
- People damage

Improper establishment cuts across all species, appearing under "All Trees," "Young trees," and mixed species entries.

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4. Temperature & Weather Extremes

Combined issues:

- Extreme temperatures
- Winter injury
- Winter desiccation
- Sunburn

- Wind damage
- Hail

Species Pattern

- **Evergreens dominate**:
    - Spruce
    - Juniper
    - Pine
- Some deciduous impacts:
    - Maple (bark split)
    - Linden and fruit trees (sunscald)

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5. Browsing, Wildli□e, and Human Pressure Are Secondary but Consistent

Grouped issues:

- Deer damage
- Voles, squirrels, porcupines
- Sap sucker
- Neglect

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6. “All Trees” and “Various” Appear O□ten — A Diagnostic Signal

Frequent entries such as:

- “All Trees”
- “Most species”
- “Any”
- “Various”

Interpretation

- This suggests:

    - Landscape-wide stressors (water, soil chemistry)
- These broad entries align most closely with:
    - Water stress
    - High pH / chlorosis
    - Improper planting

AI assisted analysis: Key points

Which environmental/abiotic issues were the hardest to manage this year? *(e.g. Winter desiccation on spruce)*

The results from this question mirrored those from "most common"

Most Important Combined Stress Complexes

1. Water stress + winter injury (especially evergreens)
2. Soil pH/compaction + chlorosis
3. Poor species selection + aging urban trees

1. Water-Related Stress Is the Most Dominant Problem

(Combine: "Water, lack of", "Water stress on mature trees", "recycled water", "Hard water")

Trend

Water issues clearly dominate across *all difficulty rankings*, especially as the **hardest to manage** abiotic factor.

Evidence from the file

- **"Water, lack of"** has by far the highest count (15 in the hardest category)
- Affects **All/Most trees**, especially:
    - Evergreens
    - Spruce
    - Poplar
- Notes of **long-term accumulated stress** ("many are starting to show symptoms from years of stress")

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2. Winter Injury Is a Major Abiotic Theme

(Combine: "Winter desiccation", "Winter kill", "Extreme temperatures")

Trend

Cold-season stress disproportionately affects **evergreens**, especially **spruce and pine**.

Evidence

- **Winter desiccation** appears multiple times (9+ hardest rankings)
- Species repeatedly listed:
    - Spruce
    - Pine
    - Juniper
    - "ALL – evergreens especially hard hit"

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3. Soil-Related Problems Are Chronic and Broad-Scale

(Combine: "Soil", "Soil nutrition/pH", "High pH", "Soil compaction", "iron chlorosis")

Trend

Soil chemistry and structure issues affect **most tree species**,

- **High pH / iron chlorosis** linked to:
    - Birch
    - Aspen
    - Maples
- **Conifers – High pH** explicitly called out
- Soil issues listed as affecting "Most tree species" and "All trees"

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4. Spruce Is the Single Most Repeatedly Affected Genus

Trend

Spruce appears across **nearly every major abiotic category**:

- Water stress
- Winter desiccation

- Winter kill
- High pH / soil nutrition
- Hard water

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5. Poor Planting & Selection Are Cross-Cutting Contributors

(Combine: “Poor tree selection”, “Planting, improper”, “overgrowth”)

Trend

Human decision-making consistently contributes to trees ending up in **unmanageable stress scenarios**.

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6. Aging Urban Trees Are Especially Vulnerable

(Combine: “Aging Cottonwood”, “urban Cottonwood”, “Water stress on mature trees”)

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7. Wildlife and Mechanical Damage Are Secondary but Persistent

(Deer, vole, squirrel damage; vandalism; bark split; salt damage)

Trend

These occur less frequently but are **additive stressors**, especially on:

- Young trees
- Thin-barked species

What new and challenging environmental/abiotic issues are you seeing in your area?

1	Changing climate factors/less water
1	Drought related problems
1	Drought stress, soil quality stress and pruning questions have been my primary questions I get from people.
1	Hardiness zone change. -45 degree winters and 90+mph wind gusts. Constant winter desiccation issues
1	Herbicide toxicity on neighboring properties when there is mixed land use ie industrial/residential
1	Insufficient watering has been an ongoing issue. Not being informed if a system is down for repairs or long term construction. With citizens, getting them to water, at least the trees, if they don't want to water their entire property. Also educating them to understand trees need water differently than turf and watering their lawn doesn't mean their trees are receiving adequate water.
1	it is very challenging to try to change mindset about planting trees with burlap and wire baskets on.
1	more drought stress in more trees
1	n/a
4	None
2	Nothing New
1	Nothing new in the form of abiotic issues in the area.
1	Nothing new to report.
1	overgrowth, lack of diversity, and lack of tree age diversity due to over suppression of wildfire in a natural cycle within the enviroment
1	public access to and misapplication of herbicides is becoming a huge problem
1	Rhizosphaera Needle Cast on Blue Spruce
1	The die off of Birch trees in Fremont county, specifically Lander.
1	The squirrel damage on crabapples and maples, and the porcupine damage on pines has increased greatly this year. They are eating large amounts of bark off of the trees during the winter.
1	The Tatarian and Amur maples usually do not have iron chlorosis but they did this year
1	Water restrictions
1	We're seeing more herbicide damage this year than in the past.