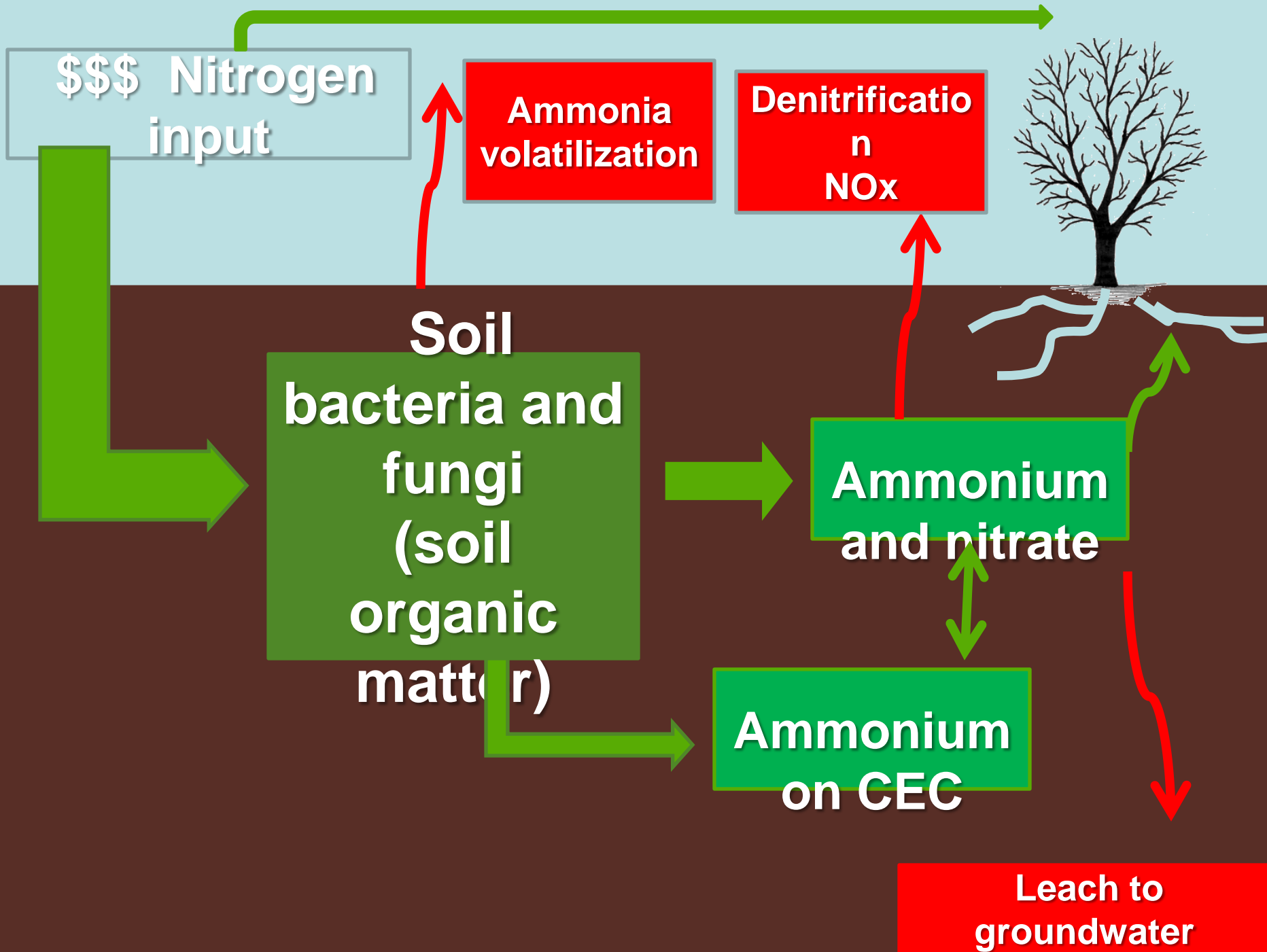


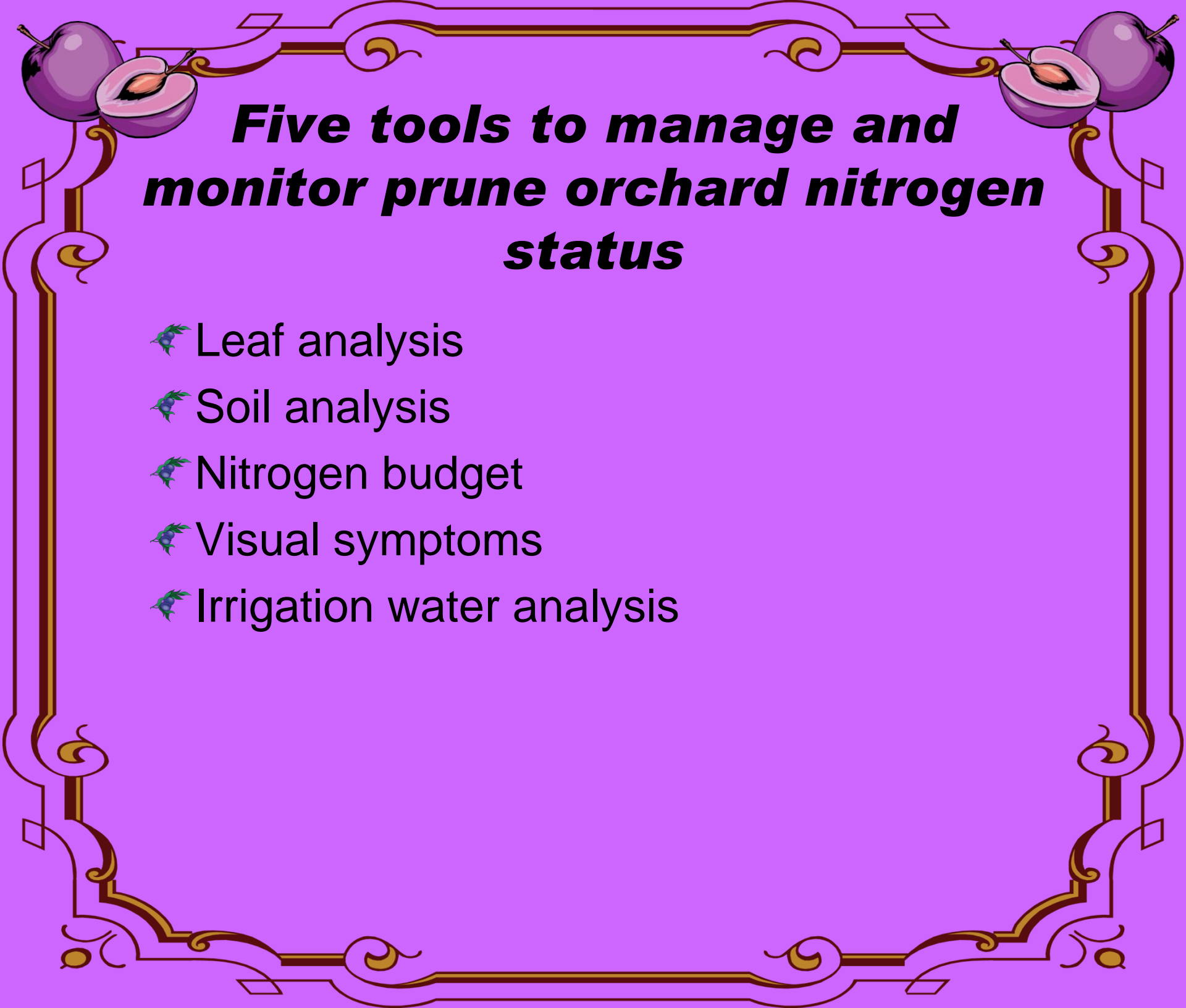


***Nitrogen Management for
French Prune
Pomology 1A***

Richard P. Buchner
UC Farm Advisor, Tehama County

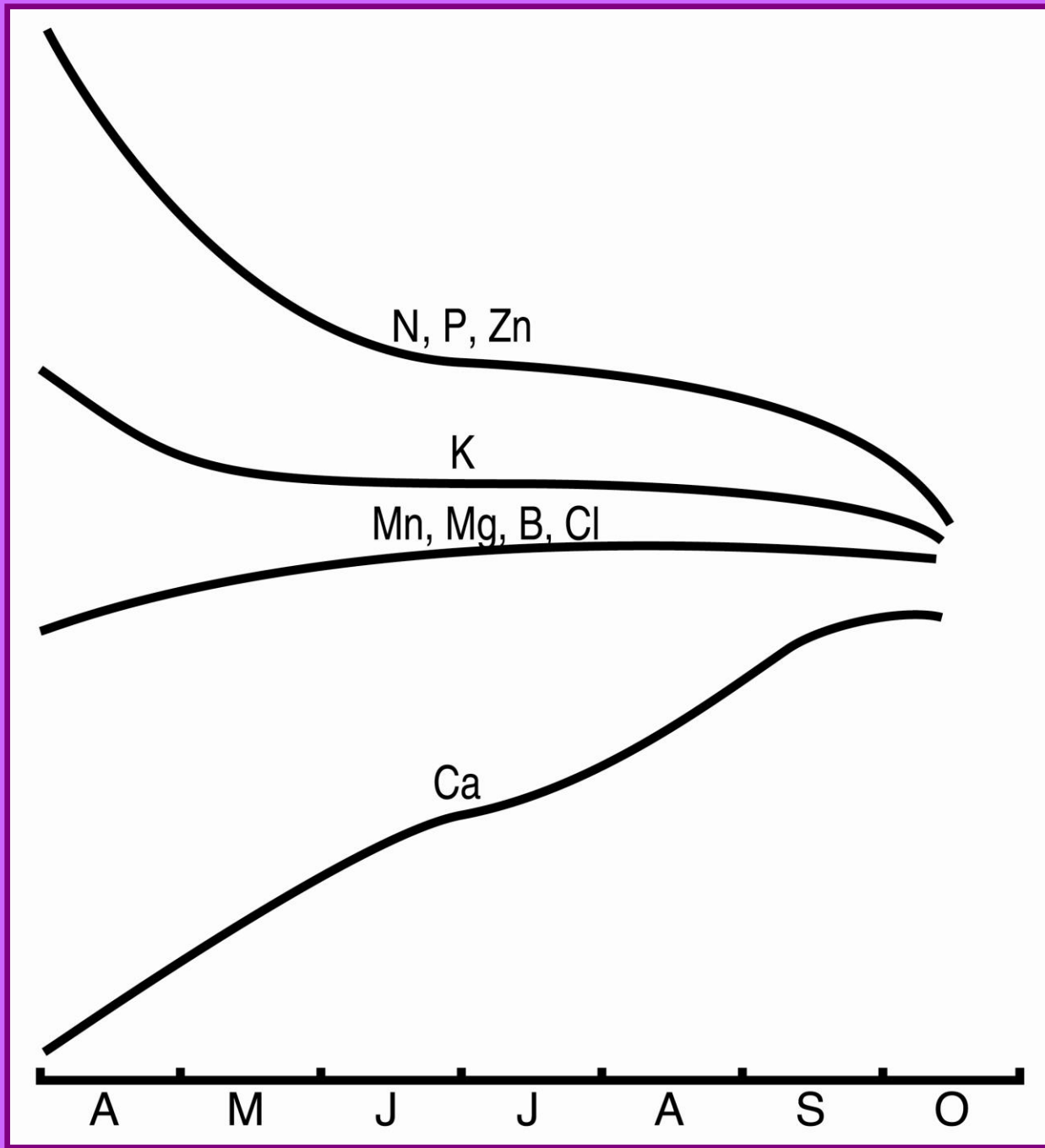
*Soil world is very complex and not well
understood*





Five tools to manage and monitor prune orchard nitrogen status

- ✿ Leaf analysis
- ✿ Soil analysis
- ✿ Nitrogen budget
- ✿ Visual symptoms
- ✿ Irrigation water analysis





Leaf Analysis

- ❖ Compare “good” vs. “poor” areas
- ❖ Non fruiting spur leaves collected in July
- ❖ One leaf per tree from 100 trees
- ❖ Low critical value 2.2%
- ❖ Aim for 2.6% to 2.8%
- ❖ Over 3.0% excessive
- ❖ Follow history and increase or decrease as necessary



Soil Analysis

- ✿ Usually used to diagnose soil quality
- ✿ pH, salinity and texture
- ✿ Problems of representative samples
- ✿ Critical nutrient levels not well documented



Nitrogen Budget

- ✿ Replace exported nitrogen
- ✿ Crop load
- ✿ 100 to 150 lbs. nitrogen/acre



**Nitrogen
Deficient**

**Nitrogen
Sufficient**







1999 Water Analysis

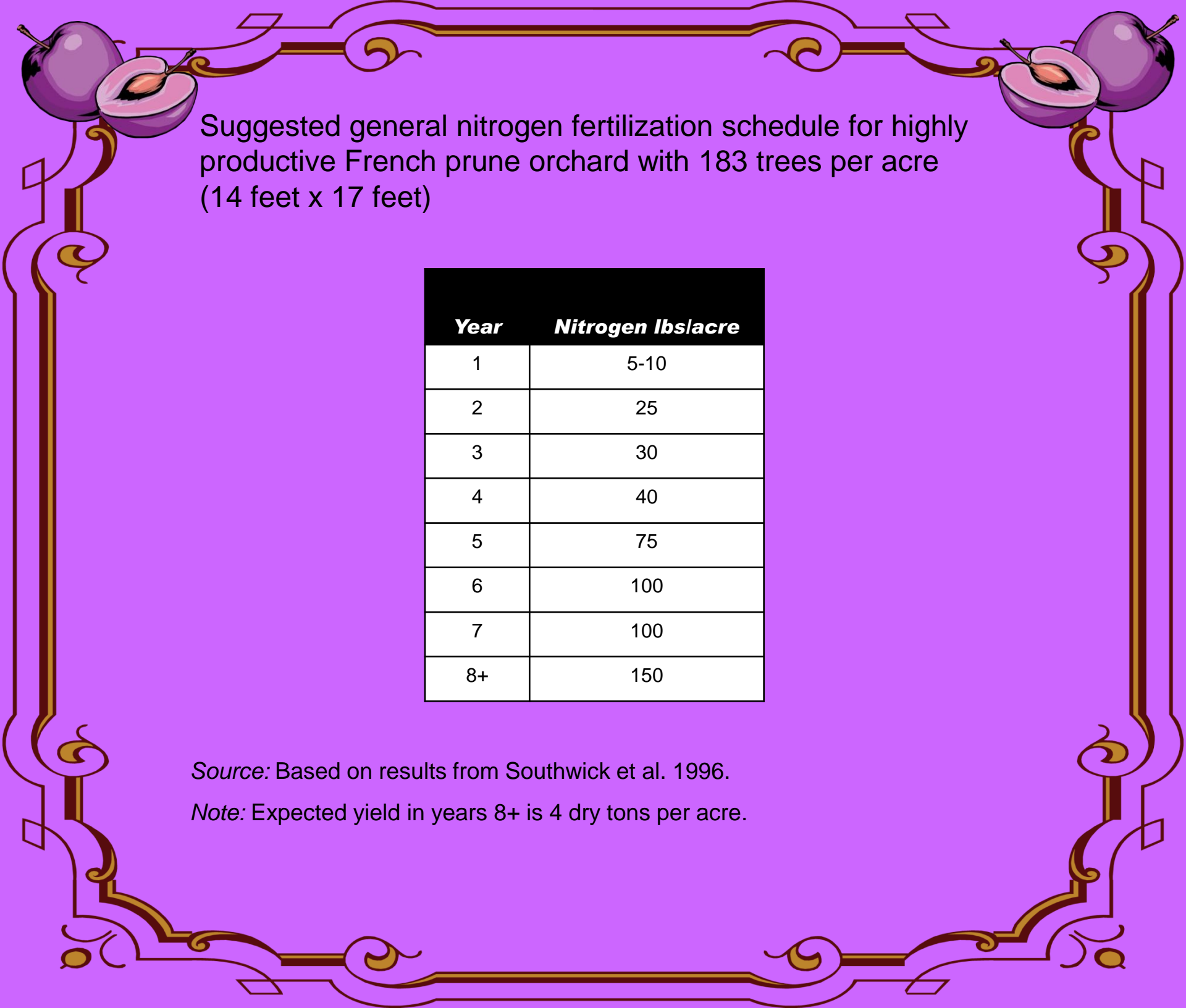
County	NO ₃ -N ppm	Lbs. N/Acre ft
Butte	10.5	28.6
Butte	5.71	15.5
Butte	<0.05	0.0
Glenn	5.18	14.1
Merced	<0.05	0.0
Sutter	1.3	3.5
Sutter	<0.05	0.0
Sutter	5.9	16.0
Sutter	8.17	22.2
Sutter	11.1	30.2
Tehama	6.05	16.5
Tehama	0.09	0.2
Tehama	2.11	5.7
Tulare	2.36	6.4
Tulare	10.1	27.5
Yolo	6.28	17.1
Yuba	1.71	4.7
Yuba	1.76	4.8

NO₃-N (ppm) x 2.72 = pounds N/Ac-foot of water





Too much N (Leaf N > 2.8%)	Too little N (leaf N < 2.2%)
Excessive vigor	Lack of vigor, poor growth
Higher fruit brown rot risk	Fewer flowers, less crop
Waste of money	More vulnerable to bac canker
Nitrate Leaching	

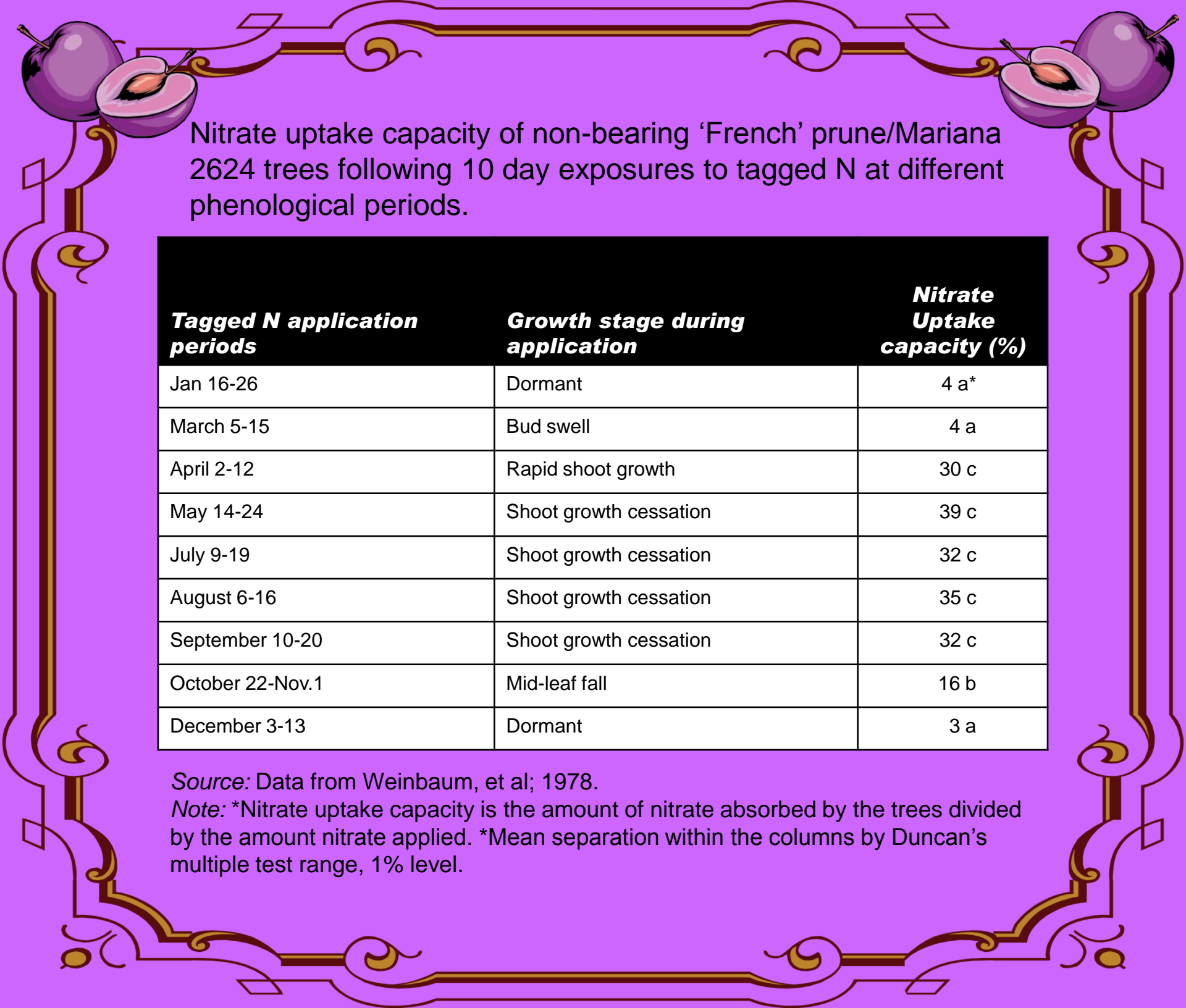


Suggested general nitrogen fertilization schedule for highly productive French prune orchard with 183 trees per acre (14 feet x 17 feet)

Year	Nitrogen lbs/acre
1	5-10
2	25
3	30
4	40
5	75
6	100
7	100
8+	150

Source: Based on results from Southwick et al. 1996.

Note: Expected yield in years 8+ is 4 dry tons per acre.



Nitrate uptake capacity of non-bearing 'French' prune/Mariana 2624 trees following 10 day exposures to tagged N at different phenological periods.

Tagged N application periods	Growth stage during application	Nitrate Uptake capacity (%)
Jan 16-26	Dormant	4 a*
March 5-15	Bud swell	4 a
April 2-12	Rapid shoot growth	30 c
May 14-24	Shoot growth cessation	39 c
July 9-19	Shoot growth cessation	32 c
August 6-16	Shoot growth cessation	35 c
September 10-20	Shoot growth cessation	32 c
October 22-Nov.1	Mid-leaf fall	16 b
December 3-13	Dormant	3 a

Source: Data from Weinbaum, et al; 1978.

Note: *Nitrate uptake capacity is the amount of nitrate absorbed by the trees divided by the amount nitrate applied. *Mean separation within the columns by Duncan's multiple test range, 1% level.



General Rules for N Fertilization in prunes

- ✓ Apply in spring (after bloom)
- ✓ 60-70% of crop and shoot requirement by June 1
- ✓ Avoid late fall and winter application
- ✓ Annual rate = 100-150 # N/acre
(with 3-4 ton/acre crop, less for smaller crop)
- ✓ Check irrigation water nitrate
- ✓ Watch crop load, adjust rate
- ✓ Leaching potential of nitrate
- ✓ Nitrogen Budget