SCOTT LABORATORIES

MANAGING DIACETYL PRODUCTION

1. STRAIN CHOICE

To maximize diacetyl: choose a strain with a high potential for diacetyl production (Beta and PN4).

To minimize diacetyl: choose a neutral strain (VP41 or O-Mega).

2. CONTACT TIME WITH LEES

To maximize: the shorter the contact time with yeast and bacteria, the higher the diacetyl. Rack off the lees or wait a few days for the yeast to die off after primary fermentation before adding bacteria. The living yeast and bacteria break down the diacetyl levels irreversibly.

To minimize: the longer the contact time with yeast and bacteria, the lower the diacetyl. The living yeast and bacteria break down the diacetyl levels irreversibly.

3. TIMING

To maximize: add malolactic bacteria after primary fermentation for a sequential fermentation. Filtering the wine to remove yeast or racking off the lees will contribute to higher diacetyl levels. Generally, the diacetyl level is highest right when the malic acid is depleted.

To minimize: a simultaneous alcoholic/malolactic fermentation will tend to produce a more fruit forward style. As the diacetyl is being produced, the yeast and bacteria will break it down. If bacteria is added after alcoholic fermentation, let the wine stay on the lees until a desired level of diacetyl is reached.

4. FERMENTATION TIME

To maximize: the longer the malolactic fermentation (MLF) the higher the diacetyl.

To minimize: the faster the malolactic fermentation (MLF), the lower the diacetyl.

5. WINE CONDITIONS

To maximize: lower pH and temperature conditions favor higher diacetyl because MLF will be slower under these conditions.

To minimize: higher pH and temperature conditions favor lower diacetyl levels because the MLF is faster.

6. STIR DURING MLF

To maximize: stir the wine during MLF to avoid reductive conditions and to allow slight oxidative conditions. The higher redox potential will tend to favor the production of diacetyl rather than a reduction to acetoin and 2, 3-butanediol, which do not contribute to the overall aroma of the wine.

To minimize: try **not** to stir the wine during MLF. The lower redox potential will tend to favor the production of acetoin and 2, 3-butanediol (rather than diacetyl) which do not contribute to the overall aroma of the wine.

7. ADDITION OF SULFITES

To maximize: $S0_2$ binds to diacetyl in a reversible reaction. When adding $S0_2$ the diacetyl level will seem to disappear, but over time the reaction will reverse and the diacetyl will be released back into the wine. $S0_2$ also inhibits yeast and bacteria activity and can stabilize the diacetyl content at the time of addition.

To minimize: $S0_2$ binds to diacetyl in a reversible reaction. Initially the diacetyl level will seem to disappear, but over time the reaction will reverse and the diacetyl will be released. Wait for the malic and citric acids to be utilized before adding sulfites. Follow the progression of diacetyl and stabilize when it reaches the desired level.

8. INOCULATION RATE

To maximize: lower bacteria inoculation rates result in higher diacetyl wines.

To *minimize:* higher bacteria inoculation rates result in lower diacetyl wines.

O-Mega	VP41	Elios 1	Alpha	Lalvin 31	Beta	PN4
Very low producer	Only attacks citric acid after completion of malic acid	Medium producer	Medium producer	Medium to low producer	High producer when used in sequential inoculation	Early attack of citric acid