Pauly Girl Fastpitch

HIGH PERFORMANCE PITCHING

Keys to Ball Movement

The following keys are listed in order of importance. For a pitcher to rise to the elite level she should understand each of these and how to master each.

#1 Speeds

Speed determines the amount of time the ball is in flight to the strike zone. Gravitational effect is a function of time. The less time (faster pitch speed) the ball is in the air the less effect gravity will have on the ball which simply means the ball will drop less…..great on a riseball but not so great for dropballs. According to the laws of physics, the acceleration of gravity is 32 feet per second per second…..this explains why every pitch must be released with some upward angle to avoid throwing it into the ground.

It is great to throw 68 MPH but one must understand the positives and negatives associated with this type of speed. Ideal dropball speeds tend to be around 62-63 MPH assuming some of the other movement keys are in place. Ideal riseball speeds are 61—65 MPH. The faster the speed the more likely for a pitcher to throw successful riseballs in the strike zone, again assuming some of the other movement keys are in place.

#2 Release Angle

All pitches require that the ball have an upward trajectory or release angle. Simple laws of physics dictate that the ball will be pulled downward by gravity during its flight to home plate. Release Angle is significantly more important than the subsequent factors in the overall movement performance of a pitch.

Dropballs require the minimum amount of upward release angle that will allow the pitch to finish at the very bottom of the strike zone. Regardless of spin rates, seam orientation, etc. this pitch will drop if thrown with the minimum release angle. The antithesis is also true. A dropball with too much release angle will not drop significantly regardless of spin rate, seam orientation, etc.

#3 Release Point

Release Point can best be described as the point in the release when the thumb begins lifting off the ball. Typically, all release points should begin near the middle of the throwing leg thigh.

But there is a second variable relative to release point that is very key---it is the height of the ball as it is being released. The height of the release is controlled by the angle of the spine and shoulders.

If the spine is vertical and the shoulders perpendicular to the spine this will provide the highest release point-----ideal for downward moving pitches like the dropball. The higher the release point the less upward release angle required to get the ball to finish at the bottom of the strike zone.

If the spine is tilted back(behind vertical) and the shoulders are perpendicular to the spine this will provide a lower release point-----ideal for upward moving pitches like the riseball. The lower the release point the more upward release angle required to get the ball to finish at either the bottom or top of the strike zone. More upward release angle means less gravitational pull affecting the balls flight……..good for riseball/bad for a dropball.

#4 Orientation of Rotation/Spin Axis

Orientation of Rotation can simply be described as the direction the ball is spinning. The spinning will create an air pressure differential on the ball. The surface of the ball spinning into the airstream creates friction and compression of the air. Pressure is always exerted at 90 degrees from the spin axis.

Balls that spin forward compress the air near the top of the ball creating higher air pressure and relieve the air as it exits off the bottom/back of the ball creating less air pressure----- when this happens the ball is forced downward. (Dropball)

Balls that spin backward compress the air near the bottom of the ball creating higher air pressure and relieve the air as it exits off the top/back of the ball creating less air pressure--- when this happens the ball is forced upward. (Riseball)

Similar pressure differentials are created depending on the orientation of rotation for curveballs, screwballs, and change-ups.

#5 Spin Rate

Spin Rate can be defined as the number of revolutions per second (RPS) that the ball is spinning. Again, the laws of physics indicate that the faster the ball spins the more compression created and thus the more pressure differential on the ball. As we know, pressure differential creates ball movement.

A side benefit of high spin rates is that the batter typically reads fast spin as fast speed. Thus, if you are able to throw a change-up or off speed pitch with a high spin rate it is very difficult for the batter to judge its speed.

#6 Seam Orientation

Seams are very important relative to creating air pressure differentials. Laws of physics indicate that the more seam surface area spinning into an air stream the more compression of the air that will take place and subsequently more pressure differential.

In viewing a softball you will note that there is a four seam orientation or a two seam orientation at release of the ball. Again, physics suggests that four seams spinning into the airstream will create greater pressure differentials and thus more movement. Thus my recommendation is that you use a grip that releases the ball with four seams spinning into the airstream.