Once back on speed and on slope, further adjustments of power and attitude will most likely be necessary – probably a small increase in power and a higher nose attitude to hold the airspeed and not go below slope. Since the initial effect of the windshear in the case illustrated is to increase performance, causing an overshoot in the airspeed and/or an overshoot of the flightpath, it is referred to as an *overshoot effect*.

An overshoot effect due to windshear will occur when an aeroplane flies into:
- a decreasing headwind;
- an increasing tailwind; or
- an updraught (e.g. a thermal).

Consider, on the other hand, an aeroplane on approach to land descending from an overlying tailwind into calm air. In this case, the aeroplane will lose, say, 10 knots of airspeed as it passes through the windshear, its nose will tend to drop, and it will go below the desired flightpath. This is known as *undershoot* effect. Appropriate corrective action would be to add power and raise the nose to regain airspeed and the desired flightpath, and then, when on speed and on slope, adjust the power and attitude as necessary.

An undershoot effect due to windshear will occur when an aeroplane flies into:
- a decreasing tailwind (Figure 7-18);
- an increasing headwind (for instance, flying near the ground under a thundercloud); or
- in a downdraught (e.g. just under the base of a mature thunderstorm).

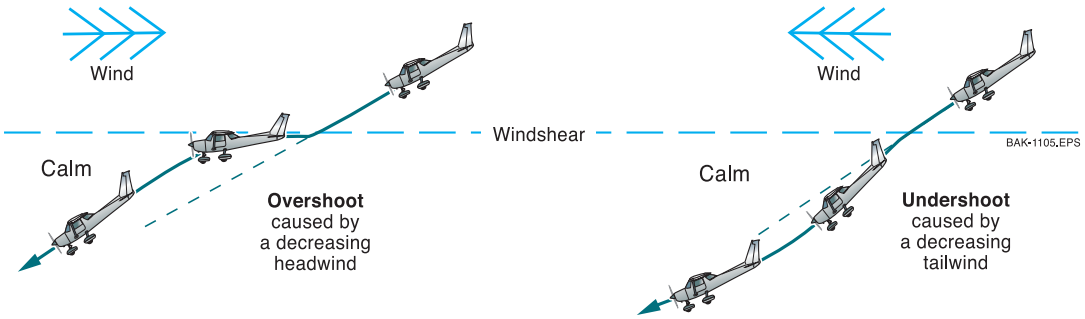

Figure 7-18 Effect of windshear in the descent.

Air Density

The 'thickness' of the air on which we depend for lift and thrust varies with pressure and temperature. The parameters are intimately interwoven. If we take a parcel of air and squash it, its pressure increases – as does its temperature and as does its density (the same amount of air is squeezed into a smaller space). More dense air gives more lift, more drag, greater stability and greater control power. Less dense air gives less.

The engine breathes air and so the pressure, temperature and density also affect its performance. Thrust reduces with reduced density (the propeller has less mass to push) and the engine power output is reduced because there is less mass and less oxygen in each charge that is fired in the cylinders. Additionally, high outside air temperatures (OAT) mean that there is less temperature rise during combustion and so, less power.